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MODULAR ENVIRONMENTAL REGULATION

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ABSTRACT

This Article proposes a “modular” conception of environmental regulation and natural resource management as an alternative to traditional approaches. Under traditional approaches, agencies tend to operate independently, and often at cross-purposes, using relatively inflexible regulatory tools, without significant stakeholder input, and without institutional mechanisms capable of adapting to changing conditions over time. Modularity, by contrast, is characterized by a high degree of flexible coordination across government agencies as well as between public agencies and private actors; governance structures in which form follows function; a problem-solving

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orientation that requires flexibility; and reliance on a mix of formal and informal tools of implementation, including both traditional regulation and contract-like agreements. The Article frames the enterprise of environmental regulation and resource management as an exercise in designing governance institutions capable of managing multiple and seemingly incompatible demands over the long term. This approach departs from the traditional legal framing of such environmental conflicts as shorter-term and zero-sum questions of jurisdiction, authority, entitlement, and prohibition.

To illustrate modularity, the Article presents a detailed case study of the CalFed Bay-Delta Program, a multiagency effort to address competing demands on the water resources in the San Francisco Bay Delta. The story of CalFed illustrates many features of the modular ideal identified in the Article, and shows concretely how such an approach can achieve both procedural and substantive policy innovation while also producing measurable environmental improvements on the ground. The case study anchors the elaboration of the modular conception and its constituent elements presented in the latter part of the Article. Finally, the Article analyzes why the modular ideal is so hard to achieve in practice, yet it concludes that there is no alternative to moving toward modularity given the complex nature of the environmental and natural resource problems that we face.

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INTRODUCTION

Traditionally, debates about reforming environmental regulation and natural resource management have focused largely on two important normative questions: First, which level of government ought to regulate or manage? And, second, using which tools?¹ In its simplest form, the first question presents a choice between federal versus state dominance of environmental regulation and management; the second presents a choice between command and control or market instruments. But of course, it is not, nor has it ever been, that simple.

Regulating environmental harms and managing fragile environmental resources require much more than assigning authority to a federal or state agency, and then choosing between, for example, a trading scheme and a technology-based standard. There is rarely a single tool, or a lone agency at either the federal or state level, that is capable of producing the desired environmental benefit by itself, especially now that the most easily captured environmental gains have been obtained through the first wave of regulation. It seems

1. Although each of these questions implicates the other, they are indeed distinct: conceivably, one can favor a strong federal role together with market mechanisms, or greater state autonomy coupled with prescriptive regulation.

increasingly indisputable, after decades of environmental regulation and management, that success with every environmental problem, including habitat conservation, air pollution control, water allocation, hazardous waste remediation, and wetlands restoration, requires not only a suite of complementary regulatory tools and the coordination of multiple levels of government, but also a wide variety of informal implementation mechanisms and the ongoing participation of key stakeholders.² This is a tall order, and it calls for a new way of thinking.

As one step in that direction, we propose a “modular” conception³ of regulation and resource management. We use modularity to convey the idea of provisional and functional rearrangement of units. We find it useful to imagine pollution regulation and resource management, like furniture, computer systems, and Lego, as alternative configurations of tools, structures, and relationships. We identify six central constituents of modularity. First, a modular approach seeks to overcome regulatory fracture through flexible coordination within and across government, and between public agencies and private actors. Second, modularity involves government structures in which form follows function, such that institutional design can be consciously tailored to policy goals. Third, modularity encourages “agreement based” decision making in addition to, and sometimes instead of, strict adherence to more traditional regulatory or managerial practices. Fourth, modular regulation facilitates “social learning” through its collaborative processes. Fifth, modularity encourages and depends upon an adaptive process, which in turn depends heavily on generating

2. We mean to include a variety of tools: traditional permitting schemes that implement government-established limits on the emission of effluents; tradable permit schemes, in which the regulator’s role is limited to capping emissions and making the initial allotment of permits; quasi-contractual systems like Project XL (in which the EPA negotiates project agreements that afford firms regulatory flexibility in exchange for improvements over the regulatory baseline), or habitat conservation plans in which the “regulation” takes the form of an agreement between a firm, an agency, and (perhaps) other stakeholders; and informational systems, in which an agency demands information disclosures, which then lead to third-party responses that affect firm behavior. See Jody Freeman, *The Contracting State*, 28 FLA. ST. U. L. REV. 155, 193–94 (2000) (describing quasi-contractual systems of environmental regulation).

3. Throughout this Article we describe our modular idea as a “conception” or “approach” rather than a “model.” We are not trying to build a model capable of predicting future events. And our approach is not, in an empirical sense, falsifiable. We are seeking instead to describe a normative ideal, and to offer examples of existing arrangements that, to some extent, illustrate it. We use the modular conception to frame and give meaning to developments that might otherwise seem disconnected or idiosyncratic.

relevant information and integrating it into decision making. Sixth and finally, a modular approach promotes accountability by supplementing traditional procedural checks with a variety of informal controls and broad stakeholder participation. We think of modularity as both a descriptive and a normative concept. It describes how some environmental initiatives actually work, and it suggests how many more might be improved.

In its most idealized formulation, modularity supposes that both the tools and the governance structures with which we approach environmental regulation and resource management can be built, unbuilt, and rebuilt—an optimistic but, we hope, compelling normative view. Modularity entails configuring and reconfiguring the component parts of the regulatory system, and deploying the actors operating within it, without necessarily replacing existing structures with something wholly new. This is pragmatic, because it leaves a relatively small institutional footprint and disrupts existing institutions as little as possible in the quest to solve evolving problems.

Framing the challenge of environmental regulation and management in this way—as, essentially, a matter of conscious design—is quite different from the traditional legal approach, which focuses on questions of jurisdiction and authority, entitlement and prohibition. This is not to suggest that the formal legal structure and its assignment of background entitlements are irrelevant. Indeed, as we will show, that structure constrains behavior in important ways, establishes crucial minimum floors, and provides a backdrop against which modularity can arise. Yet, the traditional legal framing of environmental regulation and resource management offers a limited and limiting perspective: it focuses mostly on abstract questions of who has the authority to do what to whom and on peak-level moments like the initial legislative delegation of regulatory authority to an agency, and the subsequent standard setting in agency rulemakings. Mostly, the traditional legal perspective ignores the messy business of implementation and the complicated world of interagency interaction. From a traditional perspective, the goal is not to rethink the component parts of this regulatory terrain. Rather, one takes that terrain as one finds it, merely trying to game the system to maximum advantage.

Conversely, the goal of modularity is to let the solutions to environmental problems determine institutional arrangements as much as possible. It requires focusing, first, on defining the problem

that gives rise to conflict; second, on identifying the range of plausible solutions; and third, on implementing those solutions against the background of the existing legal regime. Existing legal rules and institutions can both help and impede these tasks. They may provide the authority necessary to take action, and their limitations may generate the impetus for developing new approaches. Yet the existing rules and institutions may need to change to accommodate these new approaches, and the kind of change imagined here—to laws, rules, habits, and cultures—can be costly and painful. Nevertheless, the benefits of modularity are worth the price.

Imagine an important watershed that provides habitat for endangered species of salmon and also supplies water to both agricultural and urban consumers. Most opportunities for modularity arise in contexts like this one in which there are multiple demands on a resource and the need for effective long-term management is intense.⁴ The conflicting demands on the resource will likely result in battles over water allocation and water quality issues. A traditional legal perspective might ask, “How much water are the salmon, as opposed to the farmers and urban residents, entitled to under applicable laws and regulations?” Then agencies with jurisdiction over fish and wildlife would battle agencies with authority over water supply and water quality standards, while interest groups would strategically launch lawsuits challenging the decisions of them all.

From a modular perspective, by contrast, the relevant question is, “What do we need this watershed to do?,” and to provide an answer, we would bring the competing agencies and warring stakeholders, with their divergent perspectives and varied expertise, together. Then, against the background of the existing legal regime and the entitlements it has already established, this group would try to strike agreements and configure institutions to implement a range of mutually agreeable solutions. We expect that this would be an iterative process, evolving over time and adjusting to new information.

In conjuring this attractive image, we are not suggesting that deep and enduring value conflicts over precious resources—which

4. We do not limit our concept of modularity to the context of resource management alone. For our purposes, the traditional distinction between natural resources law and environmental law (i.e., resource management versus pollution control) is not especially useful. We are concerned about situations in which pollution issues (e.g., water quality) and traditional resource management issues (e.g., water allocation) arise together.

implicate not only economic interests but also ways of life—can be transformed into jolly cooperative exercises free of all rancor. We are, however, proposing that parties who are used to oppositional tactics can cooperate for specific purposes when the incentives for doing so are great enough and when the alternatives to cooperation are deeply unsatisfying. And we are suggesting that when structured properly, this cooperation can lead to substantive policy innovation and generate novel institutional forms. These efforts can be fragile, but they can also be surprisingly successful when measured against the limitations of traditional approaches.

Some of the features we include in our concept of modularity have been recommended already, by ourselves and others, as normatively desirable aspects of a superior approach to natural resource management.⁵ For example, we build on arguments that call, in various contexts, for collaborative problem solving, adaptive management, greater interagency coordination, and increased stakeholder participation.⁶ We build as well on arguments for, and

5. These include interagency and intergovernmental coordination; dynamic and flexible decision making; and collaborative problem solving among diverse parties.

6. See, e.g., PHILIP BRICK ET AL., *ACROSS THE GREAT DIVIDE, EXPLORATIONS IN COLLABORATIVE CONSERVATION AND THE AMERICAN WEST* 160–235 (2001) (describing a “collaborative” approach to resource management as local place-based politics, focusing on the western watershed movement); DANIEL KEMMIS, *COMMUNITY AND THE POLITICS OF PLACE* 123–36 (1992) (proposing local participatory processes for resolving traditional conflicts over resources in the west); JULIA M. WONDOLLECK & STEVEN L. YAFFEE, *MAKING COLLABORATION WORK: LESSONS FROM INNOVATION IN NATURAL RESOURCE MANAGEMENT* 47 (2000) (providing case studies of collaborative resource management efforts and analyzing what makes them successful); Bradley C. Karkkainen, *Collaborative Ecosystem Governance: Scale, Complexity and Dynamism*, 21 VA. ENVTL. L.J. 189, 193–94 (2002) (defining the characteristics of “collaborative ecosystem governance”); see also Charles Sabel et al., *Beyond Backyard Environmentalism*, in *BEYOND BACKYARD ENVIRONMENTALISM* 3, 6–7 (Joshua Cohen & Joel Rodgers eds., 2000) (describing a “rolling rule regime” whereby local units of interested stakeholders replace central command regulation by collaboratively setting their own environmental targets and the means to achieve them, while providing regulatory agencies with periodic reports and updates so the agencies may benefit from any lessons learned on the ground). As the proponents of, respectively, “collaborative governance” and “ecopragmatism,” we ourselves have elsewhere argued for elements of a modular approach. See DANIEL A. FARBER, *ECO-PRAGMATISM* 182–83, 187–88 (1999) (advocating innovative regulatory contracts between state and federal regulators and dynamic rather than static regulation); Daniel A. Farber, *Triangulating the Future of Reinvention: Three Emerging Models of Environmental Regulation*, 2000 U. ILL. L. REV. 61, 68–81 (2000) (examining the self-regulation model, the governance model, and the bargain model); Jody Freeman, *Collaborative Governance in the Administrative State*, 45 UCLA L. REV. 1, 21–33 (1997) (proposing a normative model of collaborative governance). For example, Freeman thinks of collaboration—with its emphasis on negotiation, multilateralism, adaptation, and provisionalism—as something of a precursor to a more expansive concept of modularity. Yet her theory of collaborative

experiments with, a more negotiated and consensus based approach to traditional regulations and permits.⁷ Yet despite over fifteen years of experimentation, these trends remain undertheorized.⁸ The modularity concept offers a comprehensive normative framework into which ongoing watershed and ecosystem management initiatives might fit, and against which their success might be measured.

Modularity is partly a matter of attitude and disposition. Modular thinking changes the questions one asks. For example, legal scholars and lawyers typically approach environmental and natural resource conflicts with questions about authority, jurisdiction, standards, and rules. But modularity requires more than knowing about background entitlements. A modular approach enlists lawyers

governance did not sufficiently address the need for interagency cooperation within governments, and coordination across multiple levels of government, both of which modularity requires. Her early theory of collaboration focused primarily on negotiated approaches to environmental standard setting and permitting (processes dominated typically by a single agency or by a federal and state agency working together) and relatively less on resource management involving many agencies and multiple claims on an environmental resource. *See* Freeman, *supra*, at 33–66 (providing examples of negotiated standard setting and permitting). Collaboration seems to be a prerequisite to modularity, but it is not the same thing. Nor did this earlier work explore in sufficient depth how new institutional structures might evolve out of, and be layered onto, existing arrangements without supplanting them.

For his part, Farber has taken a favorable view of what he has called the “bargaining model” of environmental regulation, arguing that bargaining among interested stakeholders could both open room for creative cooperation and also reserve enough of the adversarial procedure of government regulation to keep negotiated agreements within the bounds of acceptable protections. FARBER, *supra*, at 76–79. The concept of modularity builds on the bargaining approach because it makes negotiation among stakeholders a core feature. Yet it goes further in elaborating a complex institutional system in which governments play a strong and indispensable role, potentially satisfying Farber’s demand for cabining “deals” to ensure accountability. *See id.* at 77–79 (expressing concern for the lack of accountability present in “deals with individual sources”).

7. *See, e.g.*, Jody Freeman & Laura I. Langbein, *Regulatory Negotiation and the Legitimacy Benefit*, 9 N.Y.U. ENVTL. L. J. 60, 75–121 (2000) (reviewing empirical research on negotiated rulemaking); Freeman, *supra* note 6, at 33–40 (describing the process of consensus-based regulatory decision making).

8. *See, e.g.*, WONDOLLECK & YAFFEE, *supra* note 6, at 23–66 (offering a number of case studies as a means of judging the effectiveness of collaborative management). In 1995, the Council on Environmental Quality published a report arguing for an “Ecosystem Approach” characterized by federal agency coordination, partnerships with nonfederal stakeholders, flexibility for adaptive management, regional science planning bodies, and coordinated ecosystem budgets, among other things. COUNCIL ON ENVTL. QUALITY INTERAGENCY ECOSYSTEM MGMT. TASK FORCE, *THE ECOSYSTEM APPROACH: HEALTHY ECOSYSTEMS & SUSTAINABLE ECONOMIES* 6–7 (1995) (on file with the *Duke Law Journal*). This Report might have served as an impetus to developing a more comprehensive theory of ecosystem management and a spur to federal experimentation with concrete initiatives, but by all accounts it appears not to have had much of an impact.

in the delicate, context-sensitive and intensely value-laden project of institutional design. How do we solve these conflicting problems? How do we satisfy this collection of stakeholders? What mechanisms do we need to implement this strategy? Whose expertise and support do we need? And how do we build in accountability? Answering these questions is as much a political exercise as a legal one. It is simultaneously substantive and procedural.

In Part I, we describe some of the dominant debates in environmental law and natural resource management. The underlying assumptions that inform them, and the sheer amount of intellectual space they occupy, makes it hard to recognize modularity when it arises, let alone to pursue it as a normative goal. Nevertheless, there are trends within these debates that point toward modularity. For example, the traditional environmental federalism debate has centered on whether federal or state governments should play the lead role in environmental regulation. Yet the debate seems to have lost its “either-or” quality in recent years, and is yielding to a richer discussion about how different levels of government, including local governments and regional bodies, can best share responsibility for regulation and management.⁹ In addition, the list of potential “regulators” and “managers” seems to have expanded beyond government actors. Depending on the context, nonprofit and for-profit private actors might play important roles. This is a crucial step in the direction of modularity because it expands the universe of players that might be enlisted in decision making about resource conflicts. Similarly, the debate over regulatory tools contains the seeds of modularity. In its simplest formulation, this debate focuses on whether market mechanisms are superior to prescriptive techniques. Yet it seems increasingly clear that this either-or choice is too narrow. The real question is how best to mix these various measures, and how to adapt them optimally in different contexts. This kind of context-based attention to tool choice and regulatory design is characteristic of modular thinking.

9. We note, however, that the federal versus state focus may return in the near future. States are increasingly taking the lead in environmental regulation as the federal government enjoys a period of relative repose, and this inversion appears to be attracting scholarly attention. Consider, for example, California’s efforts to regulate greenhouse gases against the wishes of the Bush administration. See Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS L. REV. 281, 282–85 (2003) (describing California’s greenhouse gas legislation and its implications for federalism).

In Part II, we illustrate modularity with an example: the CalFed Bay-Delta Program in California, which is a long-term plan to improve water management and to restore the ecological health of the Bay-Delta water system near San Francisco. CalFed is a multistakeholder, multiagency, regionally focused approach that depends for its success on the kind of flexibility and provisionalism that we think of as modular. Though CalFed is not a perfect illustration of the normative modular ideal, it serves as a compelling and suggestive example of modularity principles.

Having provided a concrete illustration, we go on in Part III to elaborate the theory of modularity and to distill its essential features. We argue that modularity involves engaging multiple agencies and stakeholders in an ongoing problem-solving exercise. It allows regulation and management to increase in scale and scope without the encumbrance of bloated administrative agencies. At the same time, it is less utopian than proposals to replace the regulatory state with volunteerism or with a network of local environmental bodies. Finally, in Part IV, we discuss a host of obstacles to the development and diffusion of modularity. These obstacles are organizational, legal, cultural, financial, and political.

We view modularity as an important development in addressing environmental and natural resource problems, but we do not wish to romanticize it or present it as a panacea.¹⁰ Nevertheless, modularity has both a theoretical and practical payoff. From a theoretical perspective, it captures a moment of maturation in both administrative law and environmental law,¹¹ which has yet to be

10. We recognize that many environmental problems and natural resource conflicts are intractable and likely to be enduring. Modularity cannot guarantee success in their resolution, but it can increase the chances of doing better. See generally Daniel A. Farber, *Building Bridges over Troubled Waters: Eco-pragmatism and the Environmental Prospect*, 87 MINN. L. REV. 851 (2003) (discussing the obstacles encountered by movements for environmental protection).

11. In general, scholarly thinking about environmental regulation and natural resource management depends heavily on administrative law conceptions of what regulation consists of and what agencies may legitimately do. Environmental statutes are implemented, after all, by administrative agencies, and subject to administrative law constraints. See ROGER W. FINDLEY, DANIEL A. FARBER AND JODY FREEMAN, *CASES AND MATERIALS ON ENVIRONMENTAL LAW* 79 (6th ed. 2003) (introducing the administrative law boundaries for federal agencies when they are implementing environmental statutes). That is, we take for granted in environmental law many of the foundational assumptions of administrative law. But traditional administrative law assumptions, and traditional governance procedures and structures, make it difficult for modular structures to emerge. So thinking in a modular way requires not only thinking about environmental conflicts differently, it also requires a willingness to think “outside of the box” when it comes to the administrative process.

named and fully described. In this moment, traditional forms of action and institutional structures¹² are giving way to a “problem focus” that calls for new arrangements, new strategies and new capacities.¹³ We believe, in addition, that modularity can produce concrete results. That is, modular systems offer the potential for real, measurable improvements in environmental regulation and management, including healthier resources that can better withstand the stresses imposed on them by human activity. Modular institutions can also, we believe, generate better-informed, more adaptive, and sufficiently accountable decisions that wind up satisfying more stakeholders more of the time. Modularity may not be perfect, but it has the potential to be better than the traditional approach.

I. CURRENT DEBATES

As noted earlier, two of the most keenly debated issues in both environmental law and natural resource management are the appropriate locale of regulatory authority and the optimum choice of regulatory tools. The debates play out differently in the two fields, and pollution agencies differ from resource agencies in important ways, but the basic issues are common to both. These debates are important, but the way they are framed can be limiting. Among other things, their framing tends to take for granted a certain type of regulatory structure, in which a designated agency makes discrete choices from some preexisting menu of regulatory tools to deal with a previously identified problem. Even “regulatory reform” measures like cost-benefit analysis often presume the existence of such a discrete, centralized process; they want to modify the terms of engagement but not the structure of decision making. In contrast, modularity focuses on coordinated action both among multiple agencies and across levels of government. One goal of that coordination is to combine expertise and to enlist more perspectives in the design and deployment of regulatory instruments. In short, the

12. Of course, existing structures and frameworks perform a crucial function as the default against which novel arrangements emerge. On occasion, the default regulatory regime can create crisislike conditions in order to trigger the kind of cooperation on which modularity depends. *See infra* notes 171 and 317 and accompanying text.

13. We are trying to articulate what that moment looks like, even as it is happening. *See* Karkkainen, *supra* note 6, at 225–26 (arguing that ecosystem governance should not be so easily dismissed by legal scholars); Freeman, *supra* note 6, at 31–34 (making a similar argument about the need to recognize the emergence of collaborative experiments).

existing debate begins by assuming a certain type of structural rigidity that we wish to challenge.

A. *Who Should Regulate?*

There is a lively debate in both environmental law and natural resource management over the relative efficiency and comparative effectiveness of federal versus state regulation. The most visible scholarly discussion of this issue in the pollution context has taken the form of an ongoing disagreement between Professors Revesz and Engel, with the former offering a theoretical account of why state regulation will not necessarily lead to a much feared “race to the bottom,” and the latter insisting, based on empirical evidence, that such a race is inevitable.¹⁴ Scholars have long debated this issue, drawing typically on evidence and arguments about the relative expertise, institutional capacity, and vulnerability to interest group pressure of the federal and state governments.¹⁵

In the field of natural resource management, the state-versus-federal conflict is even more acute. Disputes between levels of government over who should control land and water use planning are frequently even more volatile and visible than those between, for example, state regulatory agencies and the Environmental Protection

14. Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the “Race-to-the-Bottom” Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210, 1211–27 (1992) (arguing that competition among states should not lead to a race to the bottom, and even if it did, federal environmental responses are misplaced); Kirsten Engel, *Reconsidering the National Market in Solid Waste: Trade-Offs in Equity, Efficiency, Environmental Protection, and State Autonomy*, 73 N.C. L. REV. 1481, 1546–61 (1995) (providing evidence that state competition has resulted in a race to the bottom and arguing for stronger federal regulation); Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2341–45 (1996) (distinguishing externalities from a race to the bottom and finding a role for the federal government to regulate externalities); Kirsten H. Engel, *State Environmental Standard-Setting: Is There a “Race,” And Is It “To the Bottom”?*, 48 HASTINGS L.J. 271, 271–81 (1997) (defending federal standards, as supplemented with region-based, problem-specific, state or local regulatory decision making); Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535, 554–56 (1997) [hereinafter *Race to the Bottom*] (responding to Engel and arguing that if federal intervention is to work, it needs to be broader in scope than current environmental regulation).

15. See, e.g., Daniel A. Farber, *Environmental Federalism in a Global Economy*, 83 VA. L. REV. 1283, 1301 (1997) (discussing the states’ capacity to regulate the environment); Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 578 (2001) (arguing that “plausible public choice theories” do not lend credence to the superiority of federal regulation); Richard B. Stewart, *Environmental Quality as a National Good in a Federal State*, 1997 U. CHI. LEGAL F. 199, 212–13 (1997) (arguing that conceptualizing environmental protection as a national good leads to federalization).

Agency (EPA) over air quality.¹⁶ In both contexts, though, many of the arguments are the same—for example that local control will lead to higher-quality and more legitimate decision making. Both the proponents of the “place-based” politics of the western watershed movement and of local control over pollution standards rely on this argument.¹⁷

Of course, the debate over whether state or federal governments should take the lead in environmental regulation or resource management does not turn solely on arguments about their relative efficiency and effectiveness. It also presents a constitutional question about which level of government is authorized to regulate. Both scholars and the governments themselves disagree over this. State and federal agencies regularly challenge one another’s jurisdiction, both informally and in lawsuits.¹⁸ Although the balance of federal and state power struck in the environmental arena is frequently called “cooperative federalism,”¹⁹ the relationship between the two levels of government is often deeply contentious.

In fact, federal and state agencies engage in an ongoing power struggle over almost every environmental or natural resource program—air and water pollution, endangered species protection, wetlands regulation, and water and energy supply, to name a few

16. See generally WILLIAM L. GRAF, *WILDERNESS PRESERVATION AND THE SAGEBRUSH REBELLIONS* (1990) (describing the Sagebrush Rebellion and Wise Use movement, which were precipitated by western frustration with federal control over public lands). Disputes over resources may be more intense because they tend to involve tradeoffs among competing goals or multiple uses, whereas the pollution context presents fewer tradeoffs. There, the state and federal agencies are pursuing the same goal—regulation of air quality. Instead, the debate concerns which level of government should set the relevant pollution standard and which can best achieve it.

17. See, e.g., BRICK, *supra* note 6, at 160–235 (emphasizing local place-based politics as relating to the western watershed movement); DANIEL KEMMIS, *THIS SOVEREIGN LAND: A NEW VISION FOR GOVERNING THE WEST* 177–233 (2001) (proposing to shift authority over federal public lands to regional entities); Revesz, *Race to the Bottom*, *supra* note 14, at 536–37 (arguing for a presumption in favor of decentralized regulations because they better reflect states’ differing preferences and circumstances).

18. See, e.g., *New York v. United States*, 505 U.S. 144, 144 (1992) (considering the constitutionality of the Low-Level Radioactive Waste Policy Amendments Act of 1985 after New York claimed that its Tenth Amendment rights had been violated).

19. See, e.g., Markus G. Puder & John A. Veil, *Overfiling in the Cooperative Federalism Balance: A Search Forever Incomplete and Incompletable*, 29 COLUM. J. ENVTL. L. 119, 120 (2004) (noting that cooperative federalism envisions “novel collaborative relationships between the federal government, the states and tribal authorities, and the citizen”).

examples.²⁰ States often resist federal interference with their discretion in implementing federal environmental laws.²¹ The federal government, in turn, fights hard to retain its preeminent position.²² This is true in both the pollution and natural resource contexts. For example, states have historically resisted federal efforts to exert greater control over public lands, and have argued that they, rather than the federal government, “own” wildlife within their boundaries.²³

Of course, challenges to the authority of each level of government come not just from each other but also from interest groups seeking to weaken environmental regulation generally.²⁴

20. See, e.g., *Ala. Dep’t of Env’tl. Conservation v. Env’tl. Prot. Agency*, 540 U.S. 461, 469 (2004) (holding that the EPA can override state determinations of technology standards for purposes of granting permits in Prevention of Significant Deterioration areas).

21. John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1199–1216 (1995) (detailing California’s resistance to transportation control plans under the Clean Air Act (CAA) in the 1970s).

22. Federal reluctance to allow California to independently regulate greenhouse gas emissions is a highly visible recent example of this phenomenon. In 2002, California’s legislature passed Assembly Bill No. 1493, ch. 200, §§ 2–3, 2002 Cal. Legis. Serv. 200 (West) (codified at CAL. HEALTH & SAFETY CODE §§ 42823, 43018.5 (2003)), which required the California Air Resources Board (CARB) to establish emission standards for carbon dioxide (CO₂). See Danny Hakim, *California Backs Plan for Big Cut in Car Emissions*, N.Y. TIMES, Sept. 25, 2004, at A1 (reporting CARB’s adoption of the new rules, which are to be phased in over eleven years). For potential challenges to the rules on preemption grounds, see Carlson, *supra* note 9, at 299–310. The Bush administration has issued a series of decisions indicating that it disapproves of California’s decision to regulate CO₂ emissions. See Memorandum from Robert E. Fabricant, EPA General Counsel, to Marianne Horinko, EPA Acting Administrator, EPA’s Authority to Impose Mandatory Controls to Address Global Climate Change under the Clean Air Act 1 (Aug. 28, 2003) (claiming that CO₂ is not a “pollutant” under the CAA, which California is entitled to regulate under the exception in section 209 of the Act), available at http://www.epa.gov/airlinks/co2_general_counsel_opinion.pdf; see also Carlson, *supra* note 9, at 292–93 (2003) (explaining that the administration may refuse to grant the state a waiver under the CAA, which is required for California to set air pollution standards that differ from federal standards).

23. Until the late nineteenth century, natural resources were subject to state law. This changed when the federal government began to exert its authority over public lands pursuant to the Property Clause of the Constitution. JAMES RASBAND ET AL., *NATURAL RESOURCES LAW AND POLICY* 145–46 (2004). In the 1970s, the Western states reacted to the expansion of federal control by mounting the “Sagebrush Rebellion,” a political and legal movement that sought to transfer federal lands to state control. *Id.* at 154–55. On federal efforts to intrude upon state control of wildlife, see *id.* at 329.

24. See, e.g., *Solid Waste Agency of N. Cook County (SWANCC) v. U.S. Army Corps of Eng’rs*, 531 U.S. 159, 171–72 (2001) (involving a local government agency challenge to an Army Corps regulation exerting jurisdiction over an isolated pond under its authority to issue permits to fill wetlands and holding that the regulation was beyond the agency’s authority under the Clean Water Act); *Harmon Indus., Inc. v. Browner*, 191 F.3d 894, 901–02 (8th Cir. 1999) (holding that the EPA overstepped its authority under the Resource Conservation and Recovery Act when it overfiled the state agency’s enforcement efforts).

Indeed, both levels of government are vulnerable to constitutional challenges when they regulate.²⁵ In recent years, as the federal government's Commerce Clause power has come under greater scrutiny by the Supreme Court,²⁶ a variety of environmental statutes and agency regulations have been challenged as beyond the federal government's legitimate reach.²⁷ Likewise, state efforts to take the lead in some areas have been thwarted by interest group challenges asserting, among other things, federal preemption.²⁸ In the end, the "who ought to regulate" question in environmental law consists of a theoretical debate about the relative effectiveness and efficiency of federal versus state power, and a legal dispute (between levels of government and between them and private stakeholders) over the constitutionality of one or the other level of government's asserted authority.²⁹

There are costs to this stark "either-or" framing. The federalism debate overlooks real-world environmental problems that clearly require interagency coordination, not regulation by one level of government or the other. The distribution of regulatory authority over environmental resources is much more diffuse than the federalism debate reflects. Regulatory power is often divided among a multiplicity of state and federal agencies, each with their own narrow statutory mandates, missions, organizational structures, and cultures.³⁰ Fragmentation, even among agencies at the same level of

25. See generally *Lucas v. S.C. Coastal Council*, 505 U.S. 1003 (1992) (involving a challenge to state legislation on takings grounds).

26. See *United States v. Lopez*, 514 U.S. 549, 561 (1995) (holding that the Gun Free School Zones Act exceeded Congressional authority under the Commerce Clause).

27. See *SWANCC*, 531 U.S. at 171–72 (holding that an Army Corps' rule that extended the definition of "navigable waters" under the Clean Water Act to include intrastate waters used as habitat by migratory birds exceeded authority granted to the Corps under the CWA); *Nat'l Ass'n of Home Builders v. Babbitt*, 130 F.3d 1041, 1046–47 (D.C. Cir. 1997), cert. denied, 524 U.S. 927 (1998) (holding that an application of the Endangered Species Act prohibition against the taking of endangered species was a proper exercise of Commerce Clause power to regulate channels of interstate commerce).

28. See, e.g., *Engine Mfrs. Ass'n. v. S. Coast Air Quality Mgmt. Dist.*, 158 F. Supp. 2d 1107, 1117 (C.D. Cal. 2001), aff'd, 309 F.3d 550 (9th Cir. 2002) (holding that state regulations on purchasing and leasing vehicles by fleet operators were not preempted by the Clean Air Act). For potential challenges to California's new carbon dioxide regulations on preemption grounds, see Carlson, *supra* note 9, at 299–310.

29. See Hope M. Babcock, *Dual Regulation, Collaborative Management, or Layered Federalism: Can Cooperative Federalism Models from Other Laws Save Our Public Lands?*, 3 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 193, 195 (1996) (questioning whether there are alternative models of federalism which might enhance the control of public domain lands).

30. See *infra* note 41.

government, can create enormous coordination problems.³¹ For example, whereas one agency may have primary authority over wetlands, another will have responsibility for endangered species; a third will have authority to build water power projects; and still another will be in charge of pollution standards.³² Even in cases in which a single agency has centralized authority over related programs, federal and state regulatory statutes still tend to divide environmental regulation by media, such as air, water, and solid waste, which can make it difficult for even a single agency to develop a comprehensive regulatory or management strategy.³³

Although this fragmentation makes environmental regulation more manageable in some respects, and though it can help to foster the development of expertise, it also can be counterproductive. Environmental regulation of one medium frequently creates spillover effects into others. For example, fuel oxygenates like methyl tertiary-butyl ether (MTBE), which are intended to reduce tailpipe emissions, have been found to leak from underground storage tanks and contaminate water supplies.³⁴ In these situations, addressing pollution in one medium can create new problems in another. And some environmental statutes address only part of a larger problem. For example, the Endangered Species Act focuses on species at risk of extinction. A superior approach would protect the habitat on which species depend, with biodiversity as the larger goal. Given the incompleteness of federal statutes, it is no surprise to hear reformers argue that environmental regulation and resource management must be more “holistic.”³⁵

31. See CRAIG W. THOMAS, BUREAUCRATIC LANDSCAPES: INTERAGENCY COOPERATION AND THE PRESERVATION OF BIODIVERSITY 1–26 (2003) (describing fragmented jurisdictions and the challenges of institutional cooperation).

32. See, e.g., Endangered Species Act of 1973 § 7, 16 U.S.C. § 1536 (2000) (giving the Departments of Interior and Commerce authority over protecting listed species); Clean Water Act of 1977 § 301, 33 U.S.C. § 1311 (2000) (requiring the EPA to establish effluent standards for discharges of water pollution from point sources); Clean Water Act of 1977 § 401, 33 U.S.C. § 1341 (2000) (giving the Army Corps of Engineers authority to issue permits to fill wetlands).

33. In the environmental and natural resource context, Congress typically adopts legislation on a medium-specific basis. See, e.g., Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2000); Clean Water Act of 1977, 33 U.S.C. §§ 1251–1387 (2000); Clean Air Act, 42 U.S.C. §§ 7401–7671(q) (2000).

34. Thomas O. McGarity, *MTBE: A Precautionary Tale*, 28 HARV. ENVTL. L. REV. 281, 281–82 (2004).

35. See Lakshman Guruswamy, *Integrated Environmental Control: The Expanding Matrix*, 22 ENVTL. L. 77, 87–88 (1992) (arguing that pollution control should be holistic). The “multimedia” or “integrated pollution control” strategies popular in the early 1990s emphasized

Nevertheless, consistent with their statutory mandates, most environmental agencies are organized to perform specific functions rather than to deal with cross-cutting issues, or to manage areas like watersheds or ecosystems that contain a variety of problems.³⁶ In some instances, federal agencies are officially tasked with ensuring “multiple use” of the nation’s resources (e.g., forests), which in theory suggests that they should balance conflicting goals. The historical practice of these agencies, however, has been to manage primarily for extraction and exploitation. And the efforts of the environmental and resource management agencies can be frustrated by the prodevelopment mission of other agencies. For example, the United States Bureau of Reclamation (USBR) and the Army Corps of Engineers (COE) have historically competed to dam the nation’s rivers and serve their respective client stakeholders by providing flood control and irrigation. They have been slow to modify their behavior even in light of increasing evidence of devastating environmental harm.³⁷ These agencies have developed distinct cultures and attitudes that have proved resistant to change. Not surprisingly, such historical patterns make it difficult to coordinate agency action.

Budgeting practices also pose an obstacle to coherence in environmental policymaking and management. Environmental and resource management agencies use their budgetary authority to fund their own priorities (often through different congressional committees), rather than to support activities that might be in the interest of a larger, more comprehensive program. This is partly the fault of a federal budgeting regime that funds individual agencies and not cross-cutting initiatives of a larger scope. In general, every aspect of the federal budget process—from how Congress appropriates

the limitations or consequences of fragmented regulatory programs. See generally Peter J. Fontaine, *EPA’s Multimedia Enforcement Strategy: The Struggle to Close the Environmental Compliance Circle*, 18 COLUM. J. ENVTL. L. 31 (1993). For contemporaneous theoretical perspectives, see generally *Integrated Pollution Control: A Symposium*, 22 ENVTL. L. 1 (1992).

36. For example, the Endangered Species Act requires the Departments of Interior and Commerce to take numerous steps to protect listed species but does not directly and comprehensively enable these agencies to address more complex issues of preserving biodiversity. Dale D. Goble, *The Property Clause: As If Biodiversity Mattered*, 75 U. COLO. L. REV. 1195, 1199 (2004). For an overview of what the ESA does and does not cover, see RASBAND ET AL., *supra* note 23, at 342–410.

37. See, e.g., MARC REISNER, *CADILLAC DESERT* 176–221 (1993) (recounting the history of competition between the COE and the USBR over federal dollars to build large water projects for, respectively, flood control and water supply).

dollars, to how its oversight committees supervise agencies, to how the Office of Management and Budget (OMB) oversees agency spending—is primarily oriented toward single agency projects.³⁸

The distribution of regulatory authority over the environment is further complicated by the disaggregation of power among multiple levels of government. Here the federalism debate, which focuses on the state-versus-federal conflict, misses a great deal of complexity. The federal government may possess the legal authority to regulate one aspect of a particular medium (e.g., water quality), and the state may possess legal control over another (e.g., water allocation).³⁹ Yet when it comes to day-to-day implementation of regulatory prerogatives (for example, translating regulatory standards into permits, or putting management plans into operation), the division of power is even more complicated. Local agencies like municipalities, counties, and districts may retain practical, if not legal, power to determine outcomes because they implement programs on the ground.⁴⁰ So even though federal agencies theoretically have

38. As required by the Budget and Accounting Act, 31 U.S.C. § 1104(e) (2000), each agency submits a budget request to the President. These requests are processed by OMB, which makes budgeting decisions for each agency. THE U.S. FEDERAL BUDGET PROCESS: AN OVERVIEW AND GLOSSARY OF TERMS, 14–15 (G.I. Maltese ed., 2000). These processes result in a Presidential budget focused on single agency projects. See Office of Management and Budget, Overview of the President's 2006 Budget (2005) (listing FY 2006 budget highlights, which are predominantly single-agency projects), available at <http://www.whitehouse.gov/omb/pdf/overview-06.pdf>. On the congressional side, Congress passes authorizations for specific agency programs, and appropriations proceed through House and Senate Appropriation Committee subcommittees, each of which has jurisdiction over specific agencies. THE U.S. FEDERAL BUDGET PROCESS, *supra*, at 16–17.

39. The Clean Water Act authorizes the federal government to establish effluent standards, 33 U.S.C. § 1311 (2000), and to administer the National Pollution Elimination Discharge System, which requires all point sources of water pollution to obtain permits, 33 U.S.C. § 1342 (2000). States generally have control over their water supplies, however. A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES § 1:1 (2004). For example, California operates a water conveyance system known as the State Water Project that pumps water to urban and agricultural users from reservoirs in the Bay Delta near San Francisco. The State Water Resources Control Board allocates water rights in the state and the state Department of Water Resources manages the State Water Project. David Nawi & Alf W. Brandt, CalFed Bay-Delta Program: From Conflict to Collaboration 8 (Dec. 2002) (unpublished manuscript, on file with the *Duke Law Journal*).

40. For example, though the Clean Air Act delegates the design of State Implementation Plans (SIP) to states (pursuant to EPA approval), states often further delegate the task of SIP planning to local air pollution control districts. See Clean Air Act § 110, 42 U.S.C. § 7410 (describing SIP requirements); CAL. HEALTH & SAFETY CODE §§ 40000–41357 (West 1996 & Supp. 2005) (authorizing and delineating various air pollution control districts that have primary responsibility for controlling air pollution caused by nonvehicular sources, including stationary sources). Similarly, implementing the requirements of the Clean Water Act often falls to

paramount authority under the major federal regulatory schemes, practical imperatives lead them to negotiate for the cooperation not only of state but also local governments. And of course none of these jurisdictions—state, federal, or local—may map well onto the boundaries of a given environmental problem because, as is well known, meaningful environmental units from an ecological perspective cut across jurisdictional boundaries.⁴¹

Thus, the division of responsibility for environmental regulation and natural resource management by media, among agencies at the same level of government, and among different levels of government can be extremely complex. The different mandates, cultures, management structures, and budgetary priorities of the variety of agencies involved in environmental regulation and natural resource management can present, to put it mildly, significant challenges for coordination.⁴² Yet the traditional debate in environmental and natural resource law over whether the federal or state government is constitutionally entitled to regulate, and which is better situated to do so, seems so narrowly focused as to elide most of this complexity. The tendency to cast things in federal-versus-state terms makes it more difficult to focus on even modest first steps, such as how federal and state agencies might work together more constructively.⁴³

regional or local bodies. For example, the CWA is implemented in California by a system of Regional Water Quality Control Boards, which issue and enforce regulations within their jurisdiction. CAL. HEALTH & SAFETY CODE §§ 13200–13286.9 (West 1992 & Supp. 2005).

41. See Karkkainen, *supra* note 6, at 212–17 (arguing that traditional levels of government are poorly matched to the task of ecosystem-based governance).

42. Agencies have cultures and personalities based on their historical mandates and the disciplinary training of their staff. See DANIEL A. MAZMANIAN & JEANNE NIENABER, CAN ORGANIZATIONS CHANGE? ENVIRONMENTAL PROTECTION, CITIZEN PARTICIPATION, AND THE CORPS OF ENGINEERS 8–62 (1979) (contrasting cultures of the Army Corps of Engineers and the Fish and Wildlife Service).

43. It is one thing to call for interagency coordination, as many environmental scholars do, and another to work out the incentives, mechanisms, and instruments necessary for it to happen both more regularly and more effectively. Agencies tend to defend their statutory turf, protect their budgets, and advance the interests of their constituencies to enhance their power. But doing this does not necessarily enhance their effectiveness as regulators or managers. See, e.g., Jonathan Wiener, *Managing the Iatrogenic Risks of Risk Management*, 9 RISK 39, 56–58 (1998) (noting that regulatory agency specialization based on congressional mandates and funding concerns limits the ability of such agencies to address any risks their regulations may create when such effects fall outside their regulatory scope). There appear to be relatively few formal mechanisms of interagency coordination in the federal government, although there are many informal ones. See Jody Freeman & J.R. DeShazo, *Public Agencies as Lobbyists* 58–59 (2005) (unpublished manuscript, on file with the *Duke Law Journal*) (providing empirical evidence and theoretical support for the claim that interagency lobbying can be an effective mechanism of

B. Prescriptive Regulation vs. Market Mechanisms

Environmental law and natural resource management feature another important debate over the preferred tools of environmental regulation—a debate that pits traditional “command and control” regulation (referred to here as prescriptive regulation) against market mechanisms, which are thought to be more efficient. Emissions trading schemes are the most common form of market mechanism in environmental regulation thus far. The most familiar example is the acid rain program in the Clean Air Act (CAA).⁴⁴ Emissions trading schemes allocate pollution rights within an industrial sector or geographic region based on the theory that firms that can reduce their emissions at a lower cost will be encouraged to do so by a market mechanism in which they can sell their excess allocation to firms for which such reductions would be more expensive. This presumably accomplishes the ultimate regulatory goal (which government still establishes) in the most efficient way.⁴⁵

In contrast, prescriptive regulation usually requires that all firms in a given industrial sector reduce emissions equally. Such an approach is too costly, the argument goes, because it fails to account for the marginal cost of compliance among differently situated firms.⁴⁶ Uniform regulation is widely thought to be intrusive, interfering with the industrial process by mandating the adoption of particular technologies regardless of the peculiarities of different industrial processes. Another related criticism of prescriptive regulation, especially at the national level, is that it is too “centralized” and coarse grained to respond adequately to differences in local conditions, let alone to the diversity of local preferences regarding the

legislative control over agencies). There are numerous obstacles to agency coordination, as we have seen most graphically in recent years with our national security-related agencies. The creation of a new Department of Homeland Security was meant to overcome obstacles to coordination among the FBI, CIA, and NSA, but creating new agencies is only one way to tackle the problem and often not the best. See Thomas Cmar, *Office of Homeland Security*, 39 HARV. J. ON LEGIS. 455, 464–74 (2002) (questioning the power and effectiveness of the Office of Homeland Security). We discuss the obstacles to coordination in more detail at *infra* Part IV.A.

44. 42 U.S.C. §§ 7651–7651o (2000).

45. See generally Robert N. Stavins, *What Can We Learn from the Grand Policy Experiment? Lessons from SO₂ Allowance Trading*, in *ECONOMICS OF THE ENVIRONMENT* 472 (Robert N. Stavins ed., 2000) (discussing the relative efficiency of prescriptive regulation and market mechanisms).

46. See generally Tom H. Tietenberg, *Economic Instruments for Environmental Regulation*, in *ECONOMICS OF THE ENVIRONMENT* 373 (Robert N. Stavins ed., 2000) (reviewing emissions trading and emissions charge programs that minimize the differential cost of compliance).

degree of pollution control that is appropriate given its costs. Centralized top-down regulation is thought to inhibit the kind of policy and institutional innovations that come only from local knowledge and experience.⁴⁷

Prescriptive regulation is also widely believed to inhibit technological innovation because firms required to reduce emissions to the same level have no incentive to develop new technologies that could reduce emissions even further below the agency standard.⁴⁸ Another more practical concern is that much of the information most relevant to prescriptive regulators is in the hands of industry, including information about the costs of controlling emissions, operational details about industrial processes, and rates of compliance.⁴⁹ Unless ordered to do so, industry has little incentive to reveal this kind of information fully.⁵⁰ Without this information, agencies will find implementation difficult. And prescriptive regulation requires procedures, such as rulemaking, that tend to be slow, cumbersome, conflict ridden, and, therefore, costly.⁵¹ The pace of rulemaking makes it difficult to respond to rapid changes in technology or new information.

In view of this critique, the standard advice of economists is to move toward a system of market-based incentives.⁵² Already, there are proposals to extend emissions trading to pollutants other than sulfur dioxide, as in the Bush administration's Clear Skies initiative,⁵³ as well as to carbon, as recent legislation proposes.⁵⁴ Other proposals

47. A thorough discussion of these issues can be found in Richard Stewart, *A New Generation of Environmental Regulation?*, 29 *CAP. U. L. REV.* 21, 27–38 (2001).

48. David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 *WASH. & LEE L. REV.* 289, 290–91 (1998).

49. *See id.* at 316 (providing an example of one EPA mechanism that allows industry to make unverifiable claims about compliance).

50. Cary Coglianese et al., *Seeking Truth for Power: Informational Strategy and Regulatory Policymaking*, 89 *MINN. L. REV.* 277, 278–79 (2004).

51. Philip J. Harter, *Negotiating Regulations: A Cure for Malaise*, 71 *GEO. L.J.* 1, 24 (1982).

52. The argument for economic incentives is made in Stewart, *supra* note 47, at 94–127 (discussing a series of advantages that stem from market-based incentives).

53. Clear Skies Act of 2003, H.R. 999, 108th Cong. (2003) (introduced by Representative Barton (R-TX)); Clear Skies Act of 2003, S. 485, 108th Cong. (2003) (introduced by Senator Inhofe (R-OK)). Proposals for mercury trading schemes are found in Title IV, Part A, Sec. 403 of both the House and Senate versions.

54. Climate Stewardship Act of 2003, S. 139, 108th Cong. (2003) (introduced by Senator Lieberman (D-CT) and Senator McCain (R-AZ)); Climate Stewardship Act of 2004, H.R. 4067,

go beyond the air context to address different settings and harms. Examples include watershed-based effluent trading and wetlands mitigation banking.⁵⁵ Moving further in the direction of market approaches would also presumably require making greater use of a wider range of mechanisms, including effluent taxes, deposit-refund systems, and user fees such as those levied in “Pay-As-You-Throw” waste collection systems.⁵⁶

Advocates of prescriptive regulation argue two things in response to the critique just described: first, that many of the assumptions about the uniformity, inflexibility, and high cost of prescriptive regulation are either wrong or overstated; and second, that prescriptive regulation is still necessary as the backbone of the regulatory system because market mechanisms are risky and frequently do not deliver on their promise.⁵⁷ Indeed, although some market experiments are reputed to be enormous successes (e.g., the CAA’s Acid Rain program), the empirical record on their performance is, in fact, mixed.⁵⁸ Advocates of conventional

108th Cong. (2003) (introduced by Representative Gilchrest (R-MD) and Representative Olver (D-MA)).

55. See William F. Pedersen, *Using Federal Environmental Regulations to Bargain for Private Land Use Control*, 21 YALE J. ON REG. 1, 33–34 (2004) (explaining wetlands mitigation banking); Env’tl. Prot. Agency, WATER QUALITY TRADING POLICY 1 (2003) (noting that “[m]arket-based programs can achieve water quality goals at a substantial economic savings”), available at <http://www.epa.gov/owow/watershed/trading/tradingpolicy.html>.

56. See James Salzman & J. B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 609–14 (2000) (reviewing market-based approaches to environmental regulation); Peter S. Menell, *Beyond the Throwaway Society: An Incentive Approach to Regulating Municipal Solid Waste*, 17 ECOLOGY L.Q. 655, 687–95 (1990) (explaining the “pay-as-you-throw” approach).

57. See Richard Toshiyuki Drury et al., *Pollution Trading and Environmental Injustice: Los Angeles’ Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL’Y F. 231, 283–87 (1999) (proposing a series of urban air pollution trading programs); Vivien Foster & Robert W. Hahn, *Designing More Efficient Markets: Lessons from Los Angeles Smog Control*, 38 J. L. & ECON. 19, 21–44 (1995) (discussing how prescriptive regulation relates to environmental markets and emissions trading in Los Angeles); Gary Polakovic, *Innovative Smog Plan Makes Little Progress*, L.A. TIMES, Apr. 17, 2001, at B1.

58. The sulfur dioxide trading program has been criticized for, among other things, setting the initial cap too low, allocating emissions and exemptions to powerful “special interests,” and failing to anticipate the affordability of low sulfur coal which led to relatively few auction purchases of sulfur in the early years. For an overview of such criticisms, see FINDLEY, FARBER & FREEMAN, *supra* note 11, at 378–79. For criticisms of the Regional Clean Air Incentives Market (RECLAIM) emissions trading program in Southern California, see Salzman & Ruhl, *supra* note 56, at 687 n.236.

prescriptive regulation argue that despite its imperfections, command and control has delivered significant environmental gains.⁵⁹

Even those favorably disposed to market mechanisms in theory will concede that significant problems of design and enforcement can in practice inhibit their ability to deliver environmental benefits. For example, political considerations tend to dominate the initial allocation of entitlements in market regimes (as was the case with allocation of units of sulfur dioxide pollution in the acid rain program), which can undermine their purported efficiency.⁶⁰ Markets can be too narrowly or broadly drawn, and prices can be set inaccurately. To establish an effluent tax or design an emissions trading system, the government must establish a shadow price—a price that reflects the real costs of pollution⁶¹—but the unavailability

59. The Clean Air Act and the Clean Water Act—both highly prescriptive regulatory statutes that consist of health and technology based standards—are widely acknowledged to have produced considerable environmental gains. *See, e.g.,* Frana M. Powell, *The Supreme Court Rejects The New Nondelegation Doctrine: Implications For The Administrative State*, 71 *Miss. L.J.* 729, 738 (2002):

The Clean Air Act is one of the most important environmental statutes and its successes have been well-documented. In the three decades after its adoption, the EPA reports that air pollution has been cut by 33% and acid rain by 25%, that cars are 95% cleaner, that chlorofluorocarbons that were depleting the ozone layer are being phased out, and that emissions of the six worst air pollutants dropped 33% from 1970 to 1997 despite a 31% increase in the United States population. The EPA estimates that the benefits to human health, welfare and the environment have outweighed its costs forty to one.

(footnotes omitted); *see also* U.S. Evtl. Protection Agency, Office of Wastewater Management, *Water Pollution Control: 25 Years of Progress and Challenges for the New Millennium* 1–2 (1998) (describing how, because of the Clean Water Act, thousands of cities have received federal funds to build wastewater treatment facilities to ameliorate pollution in the nation's waterways), available at <http://www.abuse.com/environment/npdespub/pubs/25PROG.PDF>.

60. *See* Lisa Heinzerling, *Selling Pollution, Forcing Democracy*, 14 *STAN. ENVTL. L.J.* 300, 320–24 (1995) (reviewing the political process that led up to the passage of the 1990 Amendments to the Clean Air Act).

61. This is most obviously true for an effluent tax, where the shadow price determines the level of the tax. But it is also true for cap-and-trade schemes. To pick the appropriate cap, the government needs to assign a shadow price to pollution to compare costs and benefits at different possible cap levels. *See* Geoffrey Heal et al., *Protecting Natural Capital Through Ecosystem Service Districts*, 20 *STAN. ENVTL. L.J.* 333, 353 (2001) (“In general, the optimal management strategy or set of strategies is the one that maximizes the value of the output of [environmental] services at shadow prices.”). Justice Breyer has summarized the debate:

“Since the price of product A does not reflect an important social cost that it imposes (in this case pollution), why,” the economist asks, “not simply raise A’s price through a tax to reflect the harm?” “But wait,” the classical regulator replies, “no one knows *how much* to raise the price. It is no easier to decide the amount of tax than to decide how much smoke the maker of product A should be allowed to emit. So why not just tackle the problem through standards?”

STEPHEN BREYER, *REGULATION AND ITS REFORM* 271 (1982).

of a market benchmark makes this a difficult undertaking. This, of course, is the problem with public goods like the environment: the ostensible market justification for intervening in environmental regulation in the first place is that the market is unable to price environmental harms properly. In addition, the more the system is tailored to local conditions, whether by adjusting the effluent or emissions tax to account for variations in harm, or by establishing a system of “exchange rates” for permits,⁶² the more cumbersome the system becomes.⁶³

Trading schemes can falter because of difficulties both in valuing environmental commodities and ensuring that trades involve commensurate goods. It may be especially challenging to devise market approaches to natural resource management rather than pollution, because natural resources, like ecosystems, perform functions that may be enormously difficult to value and to trade. As Professors Salzman and Ruhl put it, trading schemes raise problems of incommensurability and nonfungibility.⁶⁴ Markets can also create “hotspots” of concentrated pollution, which can disproportionately affect subpopulations, leading to claims of distributional inequity.⁶⁵ Again, to the extent that the market regime is tailored to address such distributional concerns, some efficiencies may be lost.

Finally, market mechanisms generally require some easily monitored indicator that can be subject to trading or tax. This may be

62. For example, if pollution has different impacts in different locations, the regime cannot allow permittees to exchange permits based on the amount of discharge. In this instance, the regime must include some kind of indexing, e.g., allowing a permit for one ton of sulfur dioxide in Location A (where the impact is high) to be exchanged for two one-ton permits in Location B (where the impact is lower). Hence the idea of exchange rates.

63. See Salzman & Ruhl, *supra* note 56, at 616–38 (examining a number of measures of exchange and currency design strategies, as they relate to environmental trading markets (ETMs)).

64. See *id.* at 634 (“[I]n analyzing the trading of nonfungible commodities one need look no farther than the cost-benefit and risk debates.”).

65. See Stephen M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?*, 56 WASH. & LEE L. REV. 111, 129–30 (1999) (“[O]lder, heavily polluting industries may find that it is more cost-effective to continue polluting and to buy pollution rights than to install new technologies to reduce pollution.”); Alice Kaswan, *Environmental Justice: Bridging the Gap Between Environmental Laws and “Justice,”* 47 AM. U. L. REV. 221, 269 (1997) (noting distributive justice problems that are created when hazardous waste disposal facilities are disproportionately located in minority or poor communities); Richard J. Lazarus, *Pursuing “Environmental Justice”: The Distributional Effects of Environmental Protection*, 87 NW. U. L. REV. 787, 848–49 (1992) (adding that many states are beginning to consider distributional factors, including Texas, which now “requires landfill permit applicants to include socio-economic information concerning the proposed site”).

feasible for some pollution problems (as with sulfur dioxide, which is emitted by a fairly small number of power plants) but it is more difficult to implement in other contexts in which there are large numbers of sources or in which the emissions rates are hard or expensive to monitor. This is the case with the pollutants that contribute to ground level ozone.

And so the debate goes. Framing the debate between prescriptive *versus* market based regulation in either-or terms echoes the dichotomous nature of the federalism debate. In reality, both environmental law and natural resource management rely on a mix of mechanisms. Moreover, neither kind of instrument is as “pure” as the two poles of the debate would suggest: virtually every market mechanism of environmental regulation depends on some prescribed government limit, such as setting a cap, in the emissions trading context, beneath which trades occur. And in all of these regimes, the government—either Congress through legislation or agencies through regulation—plays a crucial role in monitoring and adjusting the rules to respond to new events or information.

Similarly, prescriptive regulations, such as technology-based standards, are not as uniform and rigid as some would suggest.⁶⁶ Most standards are performance standards that firms can achieve in any way they choose (although admittedly, the easiest assurance of compliance is to adopt whatever technology the relevant agency used to set the standard).⁶⁷ Most importantly, prescriptive regulation always relies to some extent on adjustments in light of economic realities—both in the initial phase of level setting, when the regulatory agency takes account of industrial processes and capacities in choosing the standard, and later, when agencies negotiate particular permits.⁶⁸ There is also considerable flexibility in the enforcement process, when agencies must determine whether firms

66. See Jason Scott Johnston, *Tradeable Pollution Permits and the Regulatory Game*, in MOVING TO MARKETS IN ENVIRONMENTAL REGULATION, LESSONS FROM TWENTY YEARS OF EXPERIENCE (Jody Freeman & Charles D. Kolstad eds., forthcoming 2005) (manuscript at 12, on file with the *Duke Law Journal*) (describing the highly negotiated and nonuniform standard-setting process under both the Clean Air Act and the Clean Water Act).

67. See *id.* at 14 (explaining the system in California that “gives the discretion to local regulators to approve alternate compliance methods proposed by companies”).

68. See *id.* at 11 (describing EPA’s process of “securing technical analyses from engineering and economic consultants who sample actual industry practices and pilot projects”); *id.* at 12 (explaining that at the permitting stage, “firms have an incentive again to argue against the application of the general standard to their particular facility”).

are out of compliance and what must be done in response.⁶⁹ The so-called “command and control” system is infused with negotiation and accommodation. To label it “uniform,” “rigid,” and “centralized,” although rhetorically powerful, is somewhat misleading.⁷⁰ In practice, levels established by regulation frequently operate more like targets than like strict requirements.⁷¹ There are market-driven limits, in other words, to the extent to which government both “commands” and “controls” firm behavior.

The point is this: twenty years of experience suggests that it is impossible to declare a clear winner in this debate. Whether an instrument works optimally depends on a variety of factors, some of which are easier to predict and control than others. These include: the sophistication of the market participants; the size and diversity of the market; the vulnerability of the environmental “good” or “service” to accurate valuation; the vulnerability of the regime to political rigging in the allocation process; and the potential for gaming, shirking, and cheating by the regulated entities, among other things. The challenge now is to mix and match instruments in a way that is sensitive to the contexts—political, economic, geographical—in which they are deployed, and to remember that no matter how well-designed regulatory or management tools might be in theory, for their success they each require effective implementation and monitoring.⁷²

69. See *id.* at 17 (noting that state and local regulators exercise some discretion in the enforcement process).

70. A number of commentators have overstated these features of prescriptive regulation. See Bruce Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1335 (1985) (describing Best Available Technology regulatory requirements as “uniform”); Eric W. Orts, *Reflexive Environmental Law*, 89 NW. U. L. REV. 1227, 1237–38 (1995) (comparing command-and-control to “a centralized power”); Stewart, *supra* note 15, at 213 (describing “centralized Federal command-and-control regulation” as suffering from “excessive rigidity”); Richard B. Stewart, *Madison’s Nightmare*, 57 U. CHI. L. REV. 335, 343 (1990) (comparing the state of the regulatory system in the U.S. to the Soviet attempt at centralized management of the economy); Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L. J. 1196, 1211, 1219 (1977) (arguing that centralized Federal regulation is necessary because “structural factors” hinder decentralized efforts and observing that Federal regulation is often uniform).

71. Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 297, 299 n.10 (1999).

72. James Salzman & J.B. Ruhl, “No Net Loss”—*Instrument Choice in Wetlands Protection*, in MOVING TO MARKETS IN ENVIRONMENTAL REGULATION, LESSONS FROM TWENTY YEARS OF EXPERIENCE (Jody Freeman & Charles D. Kolstad eds., forthcoming 2005) (manuscript at 2, on file with the *Duke Law Journal*) (describing two kinds of failure: failures of instrument design and failures of implementation).

Two other, closely related debates in environmental regulation consume a great deal of scholarly oxygen and require mention here. The first is a dispute over the role of cost-benefit analysis (CBA);⁷³ the second is a disagreement over the role of risk assessment.⁷⁴ Advocates of CBA and risk assessment argue that these analytical tools are indispensable to sound environmental policy in a world of limited resources in which not all risks can be abated.⁷⁵ Yet critics argue that these tools are limited because many environmental risks, harms, and benefits cannot be meaningfully quantified.⁷⁶ Both sides of

73. See Lisa Heinzerling, *Regulatory Costs of Mythic Proportions*, 107 YALE L.J. 1981, 1984–2002 (1998) (criticizing Professor Morrall’s cost-benefit analysis methodology for its treatment of low risk estimates and discounting of future benefits, and for its narrow focus on singular, rather than multiple, regulatory benefits; Thomas O. McGarity, *Professor Sunstein’s Fuzzy Math*, 90 GEO. L.J. 2341, 2341–44 (2002) (criticizing Professor Sunstein’s reliance on EPA cost-benefit calculations and peer review by biased experts); McGarity, *supra* note 34, at 336 (pointing out the EPA’s concern that the costs of requiring double-walled gasoline storage tanks would outweigh any benefits; therefore, the regulations permit the use of cheaper, less reliable single walled tanks that result in widespread MTBE groundwater contamination); John F. Morrall, *A Review of the Record*, REG., Nov.–Dec. 1986, at 25 (calculating the costs of risk-reducing regulations per life saved and finding regulations designed to limit exposure to hazardous materials the least cost effective); Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 MICH. L. REV. 1651, 165–81 (2001) (responding, in part to Heinzerling and that of other “first generation” cost-benefit analysis critiques and arguing that cost-benefit analysis is necessary to expose poor prioritization, excessively costly tools and inattention to the unfortunate side effects of environmental regulation); Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 GEO. L.J. 2255, 2357–61 (2002) (arguing that EPA cost-benefit analysis is an improvement over the “intuitive toxicology” of ordinary people); Tammy O. Tengs et al., *Five-Hundred Life-Saving Interventions and Their Cost-Effectiveness*, 15 RISK ANALYSIS 369, 370–72 (1995) (analyzing the costs of various life-saving interventions, effectively replicating Professor Morrall’s results).

74. See John S. Applegate, *A Beginning and Not an End In Itself: The Role of Risk-Assessment in Environmental Decision-Making*, 63 U. CIN. L. REV. 1643, 1644–48 (1995) (providing moderate support for EPA risk assessment, so long as congressional policy principles are made clear and risk standards are set with consideration of the costs and feasibility of compliance); Cary Coglianese & Gary E. Marchant, *Shifting Sands: The Limits of Science in Setting Risk Standards*, 152 U. PA. L. REV. 1255, 1260 (2004) (distinguishing between risk assessment and risk management); John D. Graham, *The Risk Not Reduced*, 3 N.Y.U. ENVTL. L.J. 382, 398–402 (1995) (supporting the role of risk assessment and comparative risk measurement in helping to provide a more efficient allocation of scarce government resources to where they are most effective); Donald T. Hornstein, *Reclaiming Environmental Law: A Normative Critique of Comparative Risk Analysis*, 92 COLUM. L. REV. 562, 585–94 (1992) (arguing that risk assessment is a poor vehicle for reforming environmental law because it fails to provide a meaningful metric with which to compare conflicting types of risk).

75. John Graham, *Making Sense of Risk: An Agenda For Congress, in RISKS, COSTS, AND LIVES SAVED* 192–93 (R. Hahn ed., 1996); F. Henry Habicht II, *EPA’s Vision for Setting National Environmental Priorities, in WORST THINGS FIRST? THE DEBATE OVER RISK-BASED NATIONAL ENVIRONMENTAL PRIORITIES* 37 (Adam M. Finkel & Dominic Golding eds., 1994).

76. FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING 35–40 (2004) (suggesting that the widespread use

the debate seem to assume that this is necessarily an either-or choice. Our own view is that in practice, formalized decision tools like cost-benefit analysis and risk assessment can be helpful in some contexts but difficult to apply, or of limited use, in others. And in all cases, they are best viewed as sources of information rather than techniques that ought, in and of themselves, to determine outcomes. Choosing the level at which to set a standard, or prioritizing some regulatory targets over others, always requires a delicate weighing of economic and noneconomic considerations.

From a modular perspective, however, the debate over these tools has another weakness: it tends to focus attention on peak moments of centralized decision making when agencies first establish regulatory priorities or set standards. Yet these instances of agency action, although important, are only a small part of what agencies do. By contrast, modularity focuses attention on designing institutions and tools for implementation. Even if they are useful guides, tools such as CBA and risk assessment may need to be adapted, supplemented or, in some cases, foregone, in a modular system.

C. Beyond the Traditional Administrative Process

The tools debate also seems to overlook the complex relationship between the choice of regulatory instrument and the design of the process in which that choice is made. By this we mean that decision makers and decision making processes—the “who and how” of environmental regulation—can shape the “what” of environmental policy. Some policy tools seem more likely to emerge when traditional decision making institutions yield to unconventional forms. The example we describe in Part II, the Environmental Water Account (EWA), eluded policy makers for years, and emerged only in the context of unprecedented interagency coordination and stakeholder consultation. We think it unlikely that this policy innovation would have emerged in a traditional administrative process. Why is that so?

The debate over prescriptive versus market mechanisms in environmental law has difficulty even posing this question, partly because both sides seem to take as a given the traditional regulatory process with the lone administrative agency as its central actor—a

of cost benefit analysis, while appearing value neutral, really adopts and entrenches the normative perspective of economics).

perspective that can limit the options for regulatory design. Those who favor prescriptive regulation may wish to preserve the traditional functions of the regulatory agency with minor reforms, whereas those who favor market mechanisms may wish to severely limit or eliminate these functions. Yet framing the choice in these terms leaves undeveloped possibilities for reconfiguring the administrative apparatus.

This third option is modularity's focus. In other words, although it is important to choose the right regulatory tools, whether prescriptive requirements, market mechanisms, or other instruments, it is equally crucial to design the optimal institutional arrangements for deploying them. In fact, the two tasks—procedural design and substantive policy—are intertwined. Modularity invites imaginative thinking about how to bundle agencies and stakeholders together in unusual governance structures for particular purposes. Clinging to a traditional conception of the agency as centralized decision maker makes this exercise harder.

From a modular perspective, then, tools, procedures, and governance structures cannot be easily separated. Innovation in one may spur innovation in the other. As we explain below, interagency coordination and stakeholder consultation can lead to new policy ideas. The implementation of those new ideas may call for a new governance structure, which in turn can help to create an institutional setting conducive to generating still more policy innovation. This may not always happen, but it will sometimes. The point, for now, is that this cyclical, reinforcing relationship among policy instruments, procedures, and governance structures does not even surface in the traditional tools debate in environmental law.

This discussion leads squarely to the role of the administrative agency in environmental regulation and natural resource management. In much of environmental law scholarship, the vision of the agency, borrowed from administrative law, is of a hierarchical, stable bureaucracy exercising delegated power subject to the elaborate set of accountability devices that has come to be called administrative law.⁷⁷ Agencies are imagined to exercise delegated power in a top-down manner, promulgating rules, making plans, and pursuing projects from a position of authority and frequently in an

77. Jody Freeman, *The Private Role in Public Governance*, 75 N.Y.U. L. REV. 543, 547-48 (2000).

adversarial posture.⁷⁸ The expert regulator/manager at the top of this hierarchy is presumed to be capable of identifying the most important regulatory and management problems, and of gathering sufficient information about them (from agency staff and stakeholders) to prescribe effective solutions. These solutions are presumed, moreover, to be translatable into legally enforceable commands.⁷⁹ In this traditional view, the typical regulatory agency promulgates rules, issues guidance, monitors compliance, adjudicates violations, and imposes penalties. The typical resource management agency uses regulatory and other administrative tools to allocate resources among client stakeholders and competing uses, often doling out valuable benefits while trying simultaneously to conserve the underlying resource. Relationships are bilateral between the agency and the regulated entity or client stakeholder.⁸⁰

From this traditional perspective, information is important but used primarily to justify and defend decisions that must be made in the short term. Yet this perspective misses the importance of developing a useful information base to assist implementation over the longer term.⁸¹ In the context of environmental regulation and resource management, the need to integrate scientific and economic considerations into bureaucratic decisions over time is acute. Scientific research, in particular, often occurs over a longer timeline than agency decision making. And once an agency has promulgated a

78. Professor Freeman has made this point before in the administrative law context. *See id.* at 658 (noting, in the administrative law context, the existence of this conception of regulation, but adding that “agencies across a variety of regulatory contexts need regulated entities and independent expert organizations to assist them with implementation”). The rules might concern conventional prescriptive regulations, or they might establish or implement market mechanisms, but in either case they are created through a similar process.

79. For this view of the expert regulator, *see* Karkkainen, *supra* note 6, at 200 (“This approach assumes, in general, that there are definitive ‘right’ and ‘wrong’ answers to every question, and the challenge for the regulator is to study the problem until she decides she has enough information to prescribe a fixed rule, and then to make it stick.”). This presumes too much certainty given the “chronic information deficit” with which environmental regulators must operate. *Id.* at 201.

80. *See* Babcock, *supra* note 29, at 83 (commenting on administrative agencies and the formalistic administrative process). Agencies that rely more heavily on adjudication to create policy (which is not generally true of environmental agencies, with the exception of some state level boards that set policy through permitting decisions) operate in an even more bilateral, hierarchical, and formal way.

81. Wendy Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619, 1634 (2004) (providing that economic theory suggests that producing new information will be optimal only if its expected value is greater than the costs of its production).

rule or initiated a project or plan, the need for information only grows. Effective implementation requires information; stale science or poor data will lead to bad judgments. The traditional administrative law perspective, however, does not recognize this as a priority because it focuses inordinately on peak level moments of highly centralized agency decision making. For example, when proposing “major” rules, agencies must perform cost-benefit analyses⁸² and, in cases where agencies will significantly impact the environment, they must produce environmental impact statements as well.⁸³ Both exercises can produce a vast amount of documentation and consume considerable resources. The information generated can be used by proponents and critics of the rule or project to argue for or against it in the kind of dispute familiar to administrative and environmental lawyers. Equally important, however, is whether regulators and managers use the information in implementation. Modularity places a priority on designing structures and processes that can produce, evaluate, and integrate useful information into an ongoing decision making process, once the high visibility moments and disputes have passed.

The traditional constraints on administrative action are embodied in the Administrative Procedure Act (APA),⁸⁴ a variety of “sunshine” laws,⁸⁵ and organic statutes that occasionally enhance the APA’s procedural protections.⁸⁶ The APA itself reflects a fairly formal understanding of regulation and management: decisions are assumed to be made by a single administrative agency and there are only two primary modes of action, rulemaking or adjudication. Although informal exchanges occur frequently between stakeholders

82. See Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (1993) (requiring cost-benefit analysis for major agency rules).

83. See 42 U.S.C. § 4332 (2000) (requiring that when federal agencies propose action that may affect “the quality of the human environment” they must include in the proposal “a detailed statement by the responsible official on the environmental impact of the proposed action”).

84. Administrative Procedure Act of 1946, Pub. L. No. 79-404, 60 Stat. 237 (codified as amended in scattered sections of 5 U.S.C.).

85. See 5 U.S.C. § 552b (2000) (requiring openness to the public about the decision making processes of the federal government); see also 44 U.S.C. §§ 1501-1511 (2000) (regulating publication of the Federal Register); *id.* §§ 2204-2207 (providing rules for access to presidential records).

86. See, e.g., Clean Air Act § 307, 42 U.S.C. § 7607 (2000) (creating a hybrid rulemaking procedure that enhances the APA’s notice and comment procedure by including a “docketing” requirement that EPA must observe when it promulgates air regulations).

and agencies, opportunities for public participation once a formal decision-making process has begun are limited and highly structured.⁸⁷ The affected parties may comment during informal rulemaking or participate more fully in any formal proceedings.⁸⁸ And the primary means of redress if a stakeholder is dissatisfied with the outcome is a lawsuit seeking judicial review of the agency's decision.⁸⁹

Although this description of the administrative process is accurate, it is also superficial. For example, the two primary modes of agency action—rulemaking and adjudication—fail to capture the variety of roles that agencies can play and the range of postures they can assume. The image of the lone agency engaged in an authoritative and highly formalized decision making process like standard setting largely misses the mark, at least in the environmental and natural resource context, within which agencies often behave in ways that are as collaborative and negotiated as they are authoritative and directive. Some of the most intractable environmental problems require agencies with different missions and orientations to cooperate and coordinate, and to use instruments that are nowhere referenced in the text of the APA.

For example, agencies like EPA, the Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), USBR, and COE convene and oversee a variety of complex processes for implementing environmental regulation and managing environmental resources. Many of these efforts are regional ecosystem or watershed management initiatives that require coordination and cooperation on an unprecedented scale. Examples include the Chesapeake Bay Program,⁹⁰ the Great Lakes

87. See APA, 5 U.S.C. § 553 (2000) (requiring only “an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation”).

88. See *id.* §§ 556–557 (explaining the procedures required for formal adjudications).

89. See Freeman, *supra* note 2, at 190 (discussing how “judicially imposed reforms opened the administrative process to public scrutiny and both balanced and structured private influence”).

90. The Chesapeake Bay Program is a regional partnership that has led and directed the restoration of the Chesapeake Bay since 1983. The Chesapeake Bay Program partners include the states of Maryland, Pennsylvania, and Virginia; the District of Columbia; the Chesapeake Bay Commission, a tristate legislative body; the EPA, representing the federal government; and participating citizen advisory groups. CHESAPEAKE BAY PROGRAM, OVERVIEW OF THE BAY

Program,⁹¹ the Comprehensive Everglades Restoration Plan,⁹² the Long Term Management Strategy (LTMS),⁹³ Coastal America,⁹⁴

PROGRAM, at <http://www.chesapeakebay.net/overview.htm> (last modified Mar. 14, 2001) (on file with the *Duke Law Journal*).

91. EPA's Great Lakes National Program Office (GLNPO) "brings together federal, state, tribal, local, and industry partners in an integrated, ecosystem approach to protect, maintain, and restore the chemical, biological, and physical integrity of the Great Lakes." U.S. ENVTL. PROT. AGENCY, GREAT LAKES NATIONAL PROGRAM OFFICE, at <http://www.epa.gov/glnpo/about.html> (last updated June 16, 2004) (on file with the *Duke Law Journal*). It operates through the use of grants, interagency agreements, and contracts. *Id.*

92.

The Comprehensive Everglades Restoration Plan provides a framework and guide to restore, protect, and preserve the water resources of central and southern Florida, including the Everglades. It covers 16 counties over an 18,000-square-mile area, and centers on an update of the Central & Southern Florida (C&SF) Project [which] includes 1,000 miles of canals, 720 miles of levees, and several hundred water control structures.

THE COMPREHENSIVE EVERGLADES RESTORATION PLAN, at http://www.evergladesplan.org/about/rest_plan.cfm (updated June 2002) (on file with the *Duke Law Journal*). "Development of the Plan . . . was led by the U.S. Army Corps of Engineers, Jacksonville District and the South Florida Water Management District Many other federal, state, tribal and local agencies were active partners in developing the Comprehensive Plan." THE COMPREHENSIVE EVERGLADES RESTORATION PLAN, THE DEVELOPMENT TEAM, at http://www.evergladesplan.org/about/rest_plan.cfm (updated June 2002) (on file with the *Duke Law Journal*).

93.

A new cooperative effort by state and federal agencies, ports, environmental and fishing groups, and others was launched in January 1990 to develop a Long-Term Management Strategy (LTMS) for dredging. . . . The LTMS Project is led by an Executive Committee of the Corps of Engineers' South Pacific Division Commander, the EPA's Regional Administrator, the Chairs of the San Francisco Bay Regional Water Quality Control Board and the San Francisco Bay Conservation and Development Commission, and a State Coordinator.

SAN FRANCISCO ESTUARY PROJECT, COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN, at <http://www.abag.ca.gov/bayarea/sfep/reports/ccmp/ccmp3dw.html> (last updated July 12, 2004) (on file with the *Duke Law Journal*).

94.

Coastal America was established [in 1992] as a unique partnership among federal, state, and local governments and private alliances to collaboratively address site-specific coastal environmental problems. [Between 1992 and 1994], more than 20 federal agencies and more than 100 non-federal partners have become involved in Coastal America projects around the U.S. coastline, restoring wetland habitat and fish passage and protecting critical areas for endangered species and other wildlife. [As of 1994], more than \$30 million had been committed to Coastal America with over 60 projects in 20 States.

COASTAL AM., TOWARD A WATERSHED APPROACH: A FRAMEWORK FOR AQUATIC ECOSYSTEM RESTORATION, PROTECTION AND MANAGEMENT (Jan. 1994), at <http://www.coastalamerica.gov/text/pubs/consensus/twatoc.html> (last updated Oct. 23, 2001) (on file with the *Duke Law Journal*).

Partners for the Environment,⁹⁵ and our case study, CalFed.⁹⁶ Such initiatives usually require extensive negotiation among and between levels of government and feature long-term plans or agreements to take certain actions and fund specific activities. They rely, to a greater or lesser extent, on stakeholders such as environmental groups, farmer's associations, urban organizations, local governments, and business councils, and they depend on a host of informal agreements in addition to familiar regulatory tools such as regulations and permits.

The agencies involved in processes such as these never entirely shed their skins as authoritative regulatory entities. Indeed, their specific statutory mandates provide them needed leverage to behave more informally and to negotiate agreements when parties might otherwise refuse to come to the table. And, of course, they still set standards, issue rules, authorize permits, impose penalties, allocate benefits, and build projects.⁹⁷ Yet their roles are more varied than the traditional administrative law conception described above would suggest: the agencies are significantly involved in planning, coordination, facilitation, negotiation, and funding. These more "managerial" functions are relatively informal. They only rarely require compliance with federal and state Administrative Procedure Acts, because they rarely produce a promulgated rule or formal adjudication. As a result, much of this activity is relatively invisible, difficult to monitor, and invulnerable to judicial review.

The prevailing model of administrative agency action in environmental law, as in administrative law generally, is too

95. Through Partners for the Environment, the EPA works with more than 11,000 organizations who willingly set voluntary environmental goals and commitments like conserving water and energy or reducing greenhouse gases, toxic emissions, solid waste, indoor air pollution, and pesticide risks. Partners include small and large businesses, citizens groups, state and local governments, universities, and trade associations. U.S. ENVTL. PROT. AGENCY, VOLUNTARY PARTNERSHIP PROGRAMS, at <http://www.epa.gov/partners> (last updated June 8, 2005) (on file with the *Duke Law Journal*).

96. CalFed is a multi-agency driven comprehensive planning process for addressing a variety of water management and water quality issues arising in the Bay Delta near San Francisco. See *infra* Part II.

97. Nor should they shed this authority. It may be necessary to create a background threat against which alternatives might arise. We note that in the Bay-Delta process described in Part II, the existing statutory scheme created a crisis that helped to precipitate a modular approach. See Elizabeth Ann Rieke, *The Delta-Bay Accord: A Stride Toward Sustainability*, 67 U. COLO. L. REV. 341, 342-50 (1996) (describing how a protracted Bay-Delta water allocation conflict over California water quality standards was addressed by an agreement between California and the EPA).

formalistic to capture this complexity. Modular thinking, then, requires something different. In both administrative and environmental law, the work of reimagining the agency's role is just beginning. There are, to our knowledge, two leading proposals for rethinking the regulatory agency's role in environmental regulation. The first suggests that voluntarism and self-regulation could largely replace agency functions.⁹⁸ This perspective stresses the potential for firms and private individuals to take the initiative in controlling environmental harms instead of grudgingly complying with agency directives. Firms might do this, for example, by adopting environmental management systems that require "continuous improvement" or by committing themselves to private industry codes.⁹⁹ This will occur, in theory, because industry faces strong market incentives to improve their environmental performance.¹⁰⁰

98. See Dennis A. Rondinelli, *A New Generation of Environmental Policy: Government-Business Collaboration in Environmental Management*, 31 ENVTL. L. REP. 10,891, 10,895 (2001) (explaining how a reorientation of environmental policy from command-and-control regulation to a collaborative approach between the government and the private sector will provide administrative cost savings for the government and more competitive opportunities for the private sector). Advocates of voluntarism can point to some successes, see, e.g., John R. Ehrenfeld, *Cultural Structure and the Challenge of Sustainability*, in BETTER ENVIRONMENTAL DECISIONS: STRATEGIES FOR GOVERNMENTS, BUSINESSES, AND COMMUNITIES 234-42 (Ken Sexton et al. eds., 1999) (reviewing ten environmental codes of practice, from Total Quality Environmental Management (TQEM) to Design for Environment (DFE), that companies have implemented to promote sustainability). The voluntarist vision, however, has come under fire for relying on overly optimistic beliefs about corporate commitments to environmental performance in the face of high costs and the pressures of the market. See Rena I. Steinzor, *Reinventing Environmental Regulation: The Dangerous Journey from Command to Control*, 22 HARV. ENVTL. L. REV. 103, 157-58 (1998) (criticizing academic and professional literature that "provide[s] anecdotal, unduly cheerful conclusions about what will inspire corporate participation in reinvention initiatives" and discussing a McKinsey & Company survey that "rais[ed] intriguing questions about the difference between [corporations'] public expressions of support and concrete action").

99. See NEIL GUNNINGHAM ET AL., SMART REGULATION: DESIGNING ENVIRONMENTAL POLICY 154-72 (1998) (providing a thorough review of the Chemical Manufacturers Association's Responsible Care program and arguing that it can make a contribution to environmental protection if used as part of an integrated strategy in conjunction with other programs and actors). The Responsible Care program was adopted in response to Bhopal and the increased disclosures about toxic releases required by federal law. It stresses pollution prevention, linked to a program akin to "total quality management" for increasingly rigorous control of accidents. Although the program is ambitious, the results are as yet unclear. *Id.*

100. Consumers may favor "green" firms, putting market pressure on firms to avoid environmental misconduct. See Seema Arora & Timothy N. Cason, *An Experiment in Voluntary Environmental Regulation: Participation in EPA's 33/50 Program*, 28 J. ENV. ECON. & MGMT 271, 272 (1995) ("[R]ecent survey evidence indicates a willingness on the part of consumers to pay slightly more for environmentally clean products."). Investors may also disfavor firms with environmental violations. See James T. Hamilton, *Pollution as News: Media and Stock Market*

Indeed, there are a number of examples of industrial self-regulation, many of which are promising.¹⁰¹

The second reformist view, advanced by Professors Dorf and Sabel and called “Deliberative Democratic Polyarchy,” is more

Reactions to the Toxics Release Inventory Data, 38 J. ENVTL. ECON. & MGMT. 98, 109 (1995) (“These results indicate that the day the Toxics Release Inventory data were officially released and articles appeared with information about facility omissions, those companies with TRI omissions did experience negative, statistically significant abnormal returns.”); Madhu Khanna et. al., *Toxics Release Information: A Policy Tool for Environmental Protection*, 36 J. ENVTL. ECON. & MGMT. 243, 244 (1998) (“There is evidence that investors are paying increasing attention to environmental compliance records of companies.”); Shameek Konar & Mark A. Cohen, *Information as Regulation: The Effect of Community Right to Know Laws on Toxic Emissions*, 32 J. ENVTL. ECON. & MGMT. 109, 112 (1997) (“‘Green consumers’ may decide to boycott products of high polluting firms or otherwise look for alternatives.”). Disclosure requirements could help catalyze these effects. Konar & Cohen, *supra*. Firms might also be motivated by a desire to avoid the potential for future tort liability, or they might attempt to head off potentially onerous government regulation by creating a favorable environmental record. IAN AYRES & JOHN BRAITHWAITE, *RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE* 22–34, 90 (1992); see John W. Maxwell et. al., *Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism*, 43 J. L. & ECON. 583, 589–90 (2000) (“present[ing] a three-stage model of voluntary pollution control”). Moreover, at least some of the time, environmental protection will lower production costs because it leads to more efficient production processes. *But cf.* Timothy F. Malloy, *Regulating by Incentives: Myths, Models, and Micromarkets*, 80 TEX. L. REV. 531, 592 (2002) (arguing that firms are not black boxes and “[o]ur current use of incentives fails to recognize that a firm’s internal structure and processes can affect its response to external regulation in significant and unpredictable ways”).

101. One example is the EPA’s 33/50 program, which is a voluntary scheme to reduce emission of toxic chemicals by 33 percent in the first phase and 50 percent in the second phase. Emissions for the chemicals in question fell twice as much as those for other toxics chemicals. See Arora & Cason, *supra* note 100, at 275 (“Between 1990 and 1991 the releases and transfers of 33/50 program chemicals fell by 21% while the releases and transfers of non-33/50 chemicals fell by only 8%.”). For additional examples of self-regulation programs, see John R. Ehrenfeld, *Cultural Structure and the Challenge of Sustainability*, in *BETTER ENVIRONMENTAL DECISIONS: STRATEGIES FOR GOVERNMENTS, BUSINESSES, AND COMMUNITIES* 234–42 (Ken Sexton et al. eds., 1999) (highlighting ten self-regulation programs, such as Eco-Efficiency and The Natural Step). Perhaps the most successful mechanism to promote industry initiatives has been the Toxics Release Inventory (TRI). The TRI is triggered by a government mandate that firms report toxic emissions, but it contains no regulatory requirements. Still, information disclosure appears to have led to substantial voluntary reductions in some pollutants. See Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 GEO. L.J. 257, 287–88 (2001) (“Since TRI reporting began in 1988, reported releases of TRI-listed pollutants have dropped by nearly half . . . [and] most observers, including TRI-reporting firms, credit TRI with playing a central role in driving improvements in pollution performance.”); see also Archon Fung et. al., *After Backyard Environmentalism: Toward a Performance-Based Regime of Environmental Regulation*, 44 AM. BEHAV. SCI. 692, 697 (2000) (noting that TRI, although only an environmental regulation in the minimal sense of requiring various disclosures, actually has important disciplinary effects on private polluters because “TRI data often lead to efforts at informal regulation by community groups aimed at securing commitments to improve pollution performance”).

complicated. It suggests that federal and state agency functions might be all but replaced by networks of local decision-making entities governed by participatory democracy and directed only marginally by higher levels of government.¹⁰² Deliberative polyarchy contemplates a “form of democracy that results when a polity makes public choices by means of tiered governance councils—councils that organize service provision with the collaboration of local citizens, and pool their experience to inform their separate decisions.”¹⁰³

The primary purposes of agencies in deliberative polyarchy are

to assist state and local governments in benchmarking, and experimentalism generally, especially in connection with activities carried out under congressional authorizations; to set—again by a variation of benchmarking—regulatory standards for market actors; and to undertake such changes in their own activities and organization as cumulative self-scrutiny indicates will further these purposes.¹⁰⁴

Some agencies will provide services directly, such as administering public lands, and these agencies will have to “organize and coordinate local benchmarking evaluation” of their activities.¹⁰⁵ But regulatory agencies as we know them now would be thing of the past. For example, rather than setting pollution standards, the EPA would “coordinate industry, state, and local efforts to establish a rolling best-practice requirement.”¹⁰⁶

Both reformist ideas just described have something to offer. It makes sense to foster voluntarism and self-regulation wherever possible. Sometimes a regulatory agency can and should take a back seat to industrial initiative. Yet the prospect that voluntarism will

102. See Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267, 287–88 (1998). Professors Dorf and Sabel propose and define “directly deliberative polyarchy” as a model of:

linked systems of local and inter-local or federal pooling of information, each applying in its sphere the principles of benchmarking, simultaneous engineering, and error correction, so that actors scrutinize their initial understanding of problems and feasible solutions. . . . The system in which citizens in each locale participate directly in determining and assessing the utility of services local government provides, given the possibility of comparing the performance of their jurisdiction to the performance of similar settings, we will call *directly deliberative polyarchy*.

Id.

103. *Id.* at 320.

104. *Id.* at 345.

105. *Id.*

106. *Id.* at 396.

functionally replace federal and state agency regulation seems slight. Surveys show that business leaders are proenvironmental in the abstract, and yet their support for the environment does not necessarily translate into concrete business decisions.¹⁰⁷ And business leaders often do not view environmental regulations as having the same legitimacy as laws designed to protect the integrity of the marketplace.¹⁰⁸ Moreover, although firms may try to control their environmental impact to avoid tort liability or to reap the public relations benefits of being perceived as “green,” these incentives may not be enough to ensure compliance.¹⁰⁹ None of this means that self-regulatory initiatives that improve environmental performance do not occur, or that firms are inevitably untrustworthy partners in governance systems.¹¹⁰ But it seems quixotic to think that voluntary action by businesses will be enough to eliminate the need for regulation or government enforcement.

Deliberative polyarchy’s localist deliberation model is both vaguer and more promising in many regards than the self-regulation approach. It takes significant steps away from the formalistic view of

107. Steinzor, *supra* note 98, at 157–58. Professor Steinzor calls attention to a probing study of corporate culture by Professor Robert Jackall in the 1980s. See generally ROBERT JACKALL, *MORAL MAZES: THE WORLD OF CORPORATE MANAGERS* (1988). The study found that in a highly stressful environment, middle managers could not afford to take a long-term view, but focused instead on dealing with more immediate business issues. Steinzor, *supra* note 98, at 159–61.

108. PETER C. YEAGER, *THE LIMITS OF LAW: THE PUBLIC REGULATION OF PRIVATE POLLUTION* 8–10 (1991). As studies by Professor Robert Kagan and others have discovered, there is considerable diversity in the reaction of corporate management to environmental issues, depending on corporate culture. Robert A. Kagan & John T. Scholz, *The “Criminology of the Corporation” and Regulatory Enforcement Strategies*, in *ENFORCING REGULATION* 67 (Keith Hawkins & John M Thomas eds., 1984).

109. Clifford Rechtschaffen, *Deterrence vs. Cooperation and the Evolving Theory of Environmental Enforcement*, 71 S. CAL. L. REV. 1181, 1195 (1998). This skepticism about self-regulation finds support in two elementary economic principles. The first is that firms are rational maximizers of profits, rather than charitable institutions. Hence, to the extent that managers attempt to implement public-spirited impulses, the shareholders will take steps to bring them back under control. The second is that environmental harms are externalities, which do not affect the firms’ profitability. This is, in fact, the key economic justification for environmental regulation. Putting these two principles together, basic economics teaches us that firms will largely ignore environmental considerations as they seek to maximize their profits.

110. For a recent effort to appraise this approach to regulation, see Cary Coglianese & David Lazer, *Management-Based Regulatory Strategies*, in *MARKET-BASED GOVERNANCE: SUPPLY SIDE, DEMAND SIDE, AND DOWNSIDE* 201–19 (John D. Donahue & Joseph S. Nye eds., 2002) (noting the potential of management-based regulation and arguing that government policies should take into account firms’ incentives so that they take seriously the idea of managing to reduce social harm).

the administrative agency in an effort to reflect the reality of implementation, yet deliberative polyarchy nevertheless runs into considerable practical difficulties. Among other things, it proposes to delegate most substantive decision making authority to local units without an explanation of how those units will overcome collective action problems that impede cooperation. The theory also lacks an explanation of how those local units will be made sufficiently accountable to broader state and national constituencies that inevitably will be affected by environmental decisions.¹¹¹

111. A key difficulty with deliberative polyarchy is the impossibility of devising satisfactory administrative units. Deliberative polyarchy is compatible with the idea that different problems may have variable scales: “[t]he dimensions of effective government will change according to the particulars of the problem of governance; ‘local’ actors, whatever their limitations, know best when ‘local’ is improperly sized.” Dorf & Sabel, *supra* note 102, at 343. Thus, Congress would give the states “responsibility for determining the jurisdiction—local, statewide, regional, or jurisdictions wholly distinct from ordinary political boundaries—to be established to treat the problem.” *Id.* But it is unclear how this could work when a single decision has effects at many different levels. For example, the decision whether to build a new segment of an interstate involves questions of national transportation policy (Should we be trying to foster other modes of transportation to decrease dependence on foreign oil?), regional policy (If roads are to be built, how will they affect air pollution in the region? What areas are most in need of additional roads?), urban planning (How will the road affect existing neighborhoods?)—plus some issues whose geographic scale is harder to define, including equitable factors (depending on which groups will be impacted by the road) and environmental preservation (if the road will cross environmentally sensitive areas). There is no “right” size for the jurisdiction to address this problem. The problem affects many different geographical groups, each with its own interests and values. This is probably typical of most significant environmental issues.

Deliberative polyarchy deals with this problem by delegating it to existing local governments—essentially states and municipalities. This postpones, but does not solve, the problem of designing a structure that will be responsive to these various constituencies. In any event, it assumes that local governments will be willing to cooperate, and this may not be true except when a problem affects them all similarly. For instance, midwestern states have no incentive to join a group to solve the problem of acid rain, a problem which largely imposes costs on Eastern states. Similarly, local communities are likely to regard interstate construction as a necessity that ought, however, to take place somewhere else. NIMBY (Not In My Back Yard) presents a familiar difficulty in environmental law. Of course, it is not impossible to overcome these difficulties: the very existence of the federal Constitution is to some degree testimony to the contrary. But deliberative polyarchy leaps over a potentially severe collective action problem in its localistic approach. Even if appropriate nontraditional units can be formed, accountability remains a problem. It seems unlikely that citizens can be expected to participate directly and control dozens of overlapping units. It is optimistic enough to hope that participatory democracy can work even in existing structures of local government, without also assuming that air pollution authorities, water basin authorities, habitat conservation plans, interstate water allocators, and others will all be directly responsible to the people at large. Thus, deliberative polyarchy leaves unanswered the question of how to make these nontraditional government units accountable. If accountability is to flow from existing bodies of government, nontraditional entities must be designed to be accountable to them.

In addition, deliberative polyarchy envisions an idealized form of participatory democracy that seems somewhat utopian. And it appears that deliberative polyarchy is based on a model of decision making in nonpolitical private institutions (that is, firms) that function quite differently than public sector institutions. Among other things, firms devoted to profit making have fewer conflicts about organizational goals than public sector institutions, which must balance efficiency and fairness in the context of numerous political and legal constraints. One can imagine a benchmarking and “rolling rule” regime that functions effectively in for-profit firms simply because management, facing no internal opposition, orders that it be so. It seems less likely, however, that such an approach could work effectively in the public sector (at least without substantial oversight to ensure that the goals chosen, and the means used for achieving them, respond adequately to competing political imperatives).¹¹²

Finally, deliberative polyarchy seems to rely on a kind of effortless jet propulsion: local benchmarking and evaluation will be continuous, resulting in superior outcomes from everyone’s perspective, with little more than steering by higher levels of government. But the theory does not account sufficiently for interest group politics which could result in some fits and starts. Although we favor benchmarking as a tool, and think that agencies could help to facilitate more of it, we simply need more assurance that deliberative polyarchy would be effective in resolving environmental resource conflicts.

Most important from our perspective is that both voluntarism and deliberative polyarchy depend, ultimately, on a rather anemic view of the administrative state. The goal of both proposals is for federal agencies to disappear, or to perform the mildest of

112. For example, the engineers who design innovative missile systems know that their goal is to produce a missile with certain qualities; they do not simultaneously have to decide if building the missile is more important than alternative programs such as health care, or whether disarmament talks would be better than new weapons programs, or whether designing the best possible missile is more important than fair treatment of the participating engineers.

Political democracy is quite different. Political decisions are not just about means but also about ends, and different affected groups will have varying interests and values, resulting in divergent views about tradeoffs between competing goals even when the goals themselves are not controversial. Whatever decision is made will not be to the liking of some groups, and, except in utopian fantasy, not every individual who is affected will be able to directly participate in the decision. Thus, political democracy is about value choices, accountability, and representation, and like all other forms of politics, it is about power: the ability to do things that affect some people in ways they object to.

coordinating functions, and for state agencies to yield their functions largely to local institutions. We think this is neither realistic nor desirable. Local environmental problems have larger implications, and solutions will often have both economic and environmental spillovers that must be addressed on a larger geographical scale than the county.

In proposing modularity, we do not envision agencies operating solely in their idealized traditional form. Nor do we expect agencies, as the self-regulation approach would have it, to assume the role of cheerleader for private self-regulation. And we are skeptical about the possibility that federal and state agency functions can be replaced by local deliberative processes. Instead, we imagine federal and state agencies with statutory mandates as permanent components of the regulatory system, but components that often act only as parts of combinations. A combination may be short-term or long-term; it may include other agencies at the same level of government or agencies from other levels of government. It may include private firms and NGOs. Moreover, we imagine agencies using a broad portfolio of implementing instruments, including a range of informal agreements (e.g., records of decision; memoranda of understanding; interagency agreements; annual work plans) in addition to the more familiar and formal regulatory instruments, such as rules. What we have in mind, above all, is a sense of institutional provisionalism, flexibility, and coordination.¹¹³

D. The Building Blocks of Modularity

For all their limitations, the debates we describe here can be seen in a different light: each one, in its own way, seems to be moving in the direction of a different approach, one that is more capable of accommodating the complexity of environmental problems. For example, the recent scholarship on more decentralized resource management initiatives, including ecosystem-based governance systems and collaborative multistakeholder programs, necessarily enlarges the federalism debate by expanding it to include both more

113. Although the subject is too large to explore in this Article, this transformation in environmental governance raises great challenges for a system of review that increasingly focuses on “final” agency decisions. There is a risk that courts will either become irrelevant (because the flux of agency actions evades the requirements for review) or obstructive (because they review specific decisions in isolation without considering the broader modular context).

levels of government and a wider group of stakeholders.¹¹⁴ This literature focuses in particular on regional and local solutions, and on the important role that can be played by key stakeholders, especially members of the affected local communities who live near and use the resource in question.

The tools debate has evolved as well. Though it originally took the form of a pitched battle over whether assigning “pollution rights” is legitimate, fair, and even moral,¹¹⁵ it seems that both sides have softened in recent years. To us the right question now is not whether to use markets *or* prescriptive rules, but when and where to use which tools, and in what combination to procure a sufficient environmental benefit at an acceptable cost. And regardless of the tool chosen, it seems increasingly clear that careful attention to design on the front end and monitoring on the back end will both be crucial.¹¹⁶ Market proponents have, it seems, succeeded in legitimizing their favored policy instrument—cap and trade programs are here to stay. But proponents of prescriptive regulation have not lost entirely either. The traditional standard-setting and permitting process continues to be the backbone of environmental regulation. Our modular approach builds on recent trends in this debate, in which the task for regulators

114. See, e.g., Gerald E. Frug, *Beyond Regional Government*, 115 HARV. L. REV. 1763, 1807 (2002) (arguing that the election of a regional legislature would be likely to “generate negotiations over, and support for, a regional agenda,” including in the context of environmental issues); Karkkainen, *supra* note 6, at 217–18 (identifying the emergence of vertical and horizontal coordination across governments in the Chesapeake Bay and other initiatives in order to overcome the absence of a preexisting regional authority); *id.* at 234–35 (claiming that the legal literature has tended to be dismissive of collaborative ecosystem management but admonishing lawyers and legal scholars to “get over it” because “something is happening here, something very big, and something quite unconventional by the standards of the now familiar past”); Bradley C. Karkkainen, *Environmental Lawyering in the Age of Collaboration*, 2002 WIS. L. REV. 555, 555 (2002) (identifying new challenges to environmental lawyers presented by the emergence of regional and local collaborative environmental decision making); Sarah B. Van de Wetering & Robert W. Adler, *New Directions in Western Water Law: Conflict or Collaboration?*, 20 J. LAND RESOURCES & ENVTL. L. 15, 16 (2000) (exploring possible directions for water law in the West based on collaborative decision-making opportunities). See generally Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL. L. 973 (1995) (discussing ecosystem-based management in the context of watersheds).

115. See Drury, *supra* note 57, at 269–72 (discussing the system of “polluter pays” arising out of Superfund); Michael J. Sandel, *It’s Immoral to Buy the Right to Pollute*, N.Y. TIMES, Dec. 15, 1997, at A23 (arguing that “turning pollution into a commodity to be bought and sold removes the moral stigma that is properly associated with it”).

116. See generally MOVING TO MARKETS IN ENVIRONMENTAL REGULATION, LESSONS FROM TWENTY YEARS OF EXPERIENCE (Jody Freeman & Charles D. Kolstad eds., forthcoming 2005) (reflecting the evolution of the tools debate as described here).

is to design the right array of tools for particular problems in specific contexts.

And finally, there are trends in administrative law that point in the direction of a more modular conception of the agency, a conception in which the agency is not a lone monolith, but is embedded in a network of relationships with other agencies—relationships that must be coordinated, managed, and steered.¹¹⁷ To do this, agencies will sometimes act in traditionally authoritative and formal ways, and sometimes in less formal and more negotiated ways. And all of this will occur under conditions of radical uncertainty, which call for a spirit of provisionalism.

II. CALFED: A CASE STUDY IN MODULARITY

A. *The CalFed Story*

Before offering a more theoretical discussion of modularity, we find it useful to provide an example that illustrates many of its features. For this we turn to a process called CalFed, a multiagency regional effort to overcome the longstanding conflict over the immensely valuable water resources in the Bay-Delta area in Northern California.

1. *The Delta.* A few facts will help to convey the value of this water source. The Bay-Delta area, where the San Francisco Bay meets the two biggest rivers in California, is home to seven hundred and fifty different plant and animal species, which thrive in its unique blend of fresh and salt water.¹¹⁸ The Delta also provides 40 percent of the state's drinking water supplies and produces seven million acre-feet of water to irrigate approximately 45 percent of the state's crops, some of the most productive agricultural land in the world.¹¹⁹ In

117. See Orly Lobel, *The Renew Deal: The Fall of Regulation and the Rise of Governance in Contemporary Legal Thought*, 89 MINN. L. REV. 342, 344–45 (2004) (explaining how the governance model incorporates local initiative and central control).

118. CAL. BAY-DELTA PROGRAM, 2004 ANNUAL REPORT 10, available at http://calwater.ca.gov/AboutCalFed/AnnualReport2004/Annual_Report_2004.pdf.

119. See Rieke, *supra* note 97, at 344; Nawi & Brandt, *supra* note 39, at 4. Our account of the CalFed process draws heavily on Nawi & Brandt's informative article, and on another account by one of the key participants, Elizabeth "Betsy" Rieke, who served as Assistant Secretary for Water and Science in the Department of Interior (DOI) for two important years during the CalFed negotiations and who is universally credited with having shepherded the process along. See Rieke, *supra* note 97, at 341 (arguing, among other things, that the Clean

addition, densely populated and dry southern Californian cities depend heavily on the water supply pumped from this region. The Delta has been called the “hub”¹²⁰ and the “heart valve”¹²¹ of California’s complicated water distribution system. From this area, two pumping systems, the Central Valley Project (CVP), which is federally controlled, and the State Water Project (SWP), which is state controlled, deliver water to agricultural and urban communities.

By the time the CalFed process began in the early nineties, the health of the Bay-Delta ecosystem had been declining for years under the stress of the area’s dual roles: providing habitat for a variety of species, some endangered, and producing a crucial water supply for the famously thirsty state.¹²² Several species of fish, including Chinook salmon and steelhead trout, were in decline or endangered; water supplies were increasingly unreliable; water quality was below drinking water standards; and the Delta levee system had significant vulnerabilities to flooding.¹²³ For years, the key warring constituencies—environmentalists, urban water users, and agricultural water users—had fought to obtain a greater share of the resource.¹²⁴ Despite their collective interest in the health of the resource, one or the other stakeholder had managed to block every initiative aimed at resolving competing demands in a constructive way.¹²⁵ The conflict came to a head over whether the state would comply with federal demands that it adopt water quality standards pursuant to the Clean Water Act (CWA) in order to ensure sufficient freshwater for vulnerable fish populations protected under the Endangered Species Act (ESA). The standards would have imposed salinity and flow limits on the Delta, which in turn would have

Water Act (CWA) and Endangered Species Act (ESA) can be made more effective even without statutory changes). Our analysis also draws heavily on interviews with Patrick Wright, the Former Director of the Bay-Delta Authority, and on his unpublished personal notes analyzing CalFed, which he was kind enough to share with us. Notes of Patrick Wright [hereinafter Wright Notes] (unpublished document, on file with the *Duke Law Journal*). For several helpful conversations, we also thank Mary Nichols, Director of the Institute of the Environment at UCLA, who served as Secretary of Resources in Governor Gray Davis’s administration during a crucial period in the CalFed process.

120. Rieke, *supra* note 97, at 343.

121. Nawi & Brandt, *supra* note 39, at 4.

122. *Id.* at 4–7.

123. *Id.* at 5.

124. Rieke, *supra* note 97, at 342.

125. *Id.*

reduced the amount of water that could be diverted for urban and agricultural uses.¹²⁶

In addition, for years there had been conflict over the amount of water diverted from the north to the south of the state. Southern farmers and cities proposed building a peripheral canal to divert water around the Bay Delta instead of through it, which northerners saw as simply an effort to export more water. In 1982 a statewide referendum on the proposal was defeated with significant northern opposition.¹²⁷

2. *Regulatory Fracture.* This longstanding conflict was exacerbated by a fractured regulatory environment in which nearly two dozen federal and state agencies shared regulatory or management responsibility for some aspect of the Bay-Delta system. And they continue to share these responsibilities. For example, the State Water Resources Control Board (SWRCB) sets statewide water quality standards, but the standards must be approved by the federal EPA pursuant to the CWA.¹²⁸ The state Department of Water Resources (DWR) manages the state water conveyance system (the SWP), whereas the USBR has authority over the federal system (the CVP). This means that the federal and state government each control the water rights for water conveyed through their respective facilities. The state also contains a complex water delivery system controlled by powerful water districts like the Metropolitan Water District in Los Angeles, which purchase and allocate water locally.

In addition, the California Department of Fish and Game (DFG) is responsible for administering the state's endangered species

126. Nawi & Brandt, *supra* note 39, at 5–6.

127. See Rieke, *supra* note 97, at 346 (“Northerners saw the canal not as an improvement but as a means to move ever-increasing amounts of water from north to south, to the detriment of both northern economies and the health of the Bay-Delta.”).

128. It is at least arguable that the federal government does not possess regulatory authority over salinity standards under the CWA, because these water quality standards related to flow levels necessary to sustain endangered fish, and not pollutants that are normally regulated by the EPA under the CWA. During the pre-CalFed conflict, the EPA sought to exert its authority and argued publicly that it was not limited to pollutant-specific parameters, even though privately agency officials thought they might lose in court. *See id.* at 354–55 (noting how agency officials “tentatively concluded that the authority to reallocate water supplies from California water users to the environment has vested not in EPA but in the State Board”). At the time, the federal government sought to use its leverage, both under the CWA and under the listing provisions of the ESA, to press California to take the lead in crafting a solution to the Delta conflict. Interview with Patrick Wright, Former Director, California Bay-Delta Authority [hereinafter Wright Interview] 1–2 (July 12, 2004) (on file with the *Duke Law Journal*).

legislation, while the FWS in the Department of Interior (DOI) and the National Marine Fisheries Service in the Department of Commerce (DOC) share responsibility for implementing the federal ESA. And finally, COE has some authority over wetlands under the Clean Water Act and also implements flood control projects that affect the Delta.¹²⁹

Before the CalFed process, there was no governmental mechanism for coordinating activities across these agencies, or for including stakeholders in Delta-related decision making in an ongoing way. For the most part, agencies were reactive and defensive, blocking the initiatives of their competitor agencies and trying to protect their own constituencies.¹³⁰ The federal-state relationship reached a low in the early 1990s when then-Governor Pete Wilson refused to allow the State Water Board to set water quality standards for the Bay Delta (as required by the Clean Water Act), arguing that the federal government was interfering with the state's prerogative to allocate water resources by listing species on a piecemeal basis under the ESA. Again, listings would have required pumping reductions at both the CVP and the SWP in order to protect the fish, which would have limited water diversions for agricultural and residential use. The Governor claimed, partly in response to political imperatives,¹³¹ that federal enforcement of the ESA was wreaking havoc with the state's water supply. As a result, the conflict reached a stalemate.¹³²

3. *The Origins of CalFed.* The first step toward a more elaborate multiagency effort to better manage this resource began with a federal interagency agreement. In 1993, after two years of negotiation, representatives of EPA, NMFS, FWS, and USBR signed an "Agreement of Coordination on California Bay/Delta Issues" that

129. Nawi & Brandt, *supra* note 39, at 9.

130. See Wright Interview, *supra* note 128, at 1.

Stakeholders were in gridlock for two decades because the agricultural, urban and environmental stakeholders could block each other but neither had enough clout to get their agenda enacted. The environmentalists could block new dams for twenty years but the existing dams were still killing the fish, and there was nothing they could do but invoke the Endangered Species Act.

131. Rieke describes policy insiders as suggesting that Governor Wilson was bowing to pressure from the agricultural sector, whose support he needed for his 1994 reelection campaign. Rieke, *supra* note 97, at 347.

132. See *id.* at 346-48 (stating that it was not until December 15, 1994, that "peace ha[d] broken out in California's long-running water wars").

committed the agencies to an ecosystem-based, and therefore more comprehensive, approach to the bundle of issues in the Delta.

In the abstract, an agreement like this sounds unremarkable. However, at the time and in the context, it represented a dramatic departure from business as usual.¹³³ Until CalFed, the SWRCB was the primary institution for resolving water-related conflicts in the state. The Board is a quasi-judicial independent agency that makes many of its policy decisions based on evidence submitted by parties.¹³⁴ Adjudicatory proceedings before the Board tend to exacerbate adversarial relationships among the parties. In this context, there is no tradition of parties working together to solve problems, nor is there any incentive for them to do so. Following the Agreement, the federal agencies—which now called themselves “Club-Fed”—began to act collectively, holding joint briefings and press conferences and participating together, as a united front, in state level workshops and hearings.¹³⁵

The Agreement’s most remarkable feature was its coordinated approach. The agencies agreed to identify collectively decisions that would impact the Bay Delta, to coordinate the timetables of those decisions, and to convey clearly the collective impact they would have on the system.¹³⁶ They agreed to cooperate, moreover, on specific regulatory initiatives. For the first time, they published an integrated set of regulatory proposals in the Federal Register.¹³⁷ To appreciate

133. Wright Interview, *supra* note 128, 1–2.

134. See *United States v. State Water Res. Control Bd.*, 182 Cal. App. 3d 82, 112–13 (1986) (stating that the Board operates in a quasi-legislative capacity for establishing water quality standards and in a quasi-judicial capacity for determining water rights); Norman K. Johnson & Charles T. DuMars, *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 NAT. RESOURCES J. 347, 379 (1989) (“The California Water Resources Control Board is an independent quasi-judicial body whose regulatory authority includes jurisdiction over the State Water Project and all other appropriators.”); California Environmental Protection Agency, State Water Resources Control Board, *Procedures Governing Adjudicative Proceedings before the State Water Resources Control Board and California Regional Water Quality Control Boards* 1 (Oct. 2, 1998) (“An adjudicative proceeding is a hearing to receive evidence for determination of facts pursuant to which the [Board] formulates and issues a decision. . . . Rulemaking and information proceedings . . . are not adjudicative proceedings and are subject to different procedures.”), available at http://www.waterrights.ca.gov/WRINFO/docs/procedures_govern_adjudicative_proceedings.pdf.

135. Rieke, *supra* note 97, at 361.

136. *Id.*

137. Water Quality Standards for Surface Waters of the Sacramento River, San Joaquin River, and San Francisco Bay and Delta of the State of California, 60 Fed. Reg. 4,664 (Jan. 24, 1995) (to be codified at 40 C.F.R. pt. 131).

the difficulty of doing this, imagine the different time lines and political pressures under which agencies normally operate. Regulatory priorities are usually affected by a host of conditions, including court-imposed deadlines, congressional oversight, and political direction from executive branch appointees. These influences, together with the different statutory mandates and budgetary constraints that shape agency behavior, can lead agencies to approach interconnected problems in a rather uncoordinated way. Yet in this case, the four agencies committed to work together. Betsy Rieke, the assistant secretary of Interior most responsible for the negotiations, claims that each of the federal agencies “took responsibility for solving the whole problem we jointly faced, not just their agency’s portion of the problem.”¹³⁸

What difference did this make? Traditionally, the EPA sets water quality standards (either on its own or by approving state standards), whereas wildlife agencies independently list endangered species and designate their critical habitat. The problem with this divided approach is that species survival and recovery can depend on water quality, including not only pollutants discharged from point sources but also salinity and flow criteria. Here, the EPA might never have coordinated with FWS had they not been facing the prospect of litigation over whether the CWA authorized them to set these salinity standards. Given that likelihood, however, the EPA approached FWS “with the idea of establishing a set of salinity standards that would serve as both the EPA promulgated standards under the CWA, and as the critical habitat designation under the ESA.”¹³⁹ Under the new interagency agreement, the four agencies decided, for the first time, to issue regulations simultaneously.¹⁴⁰ Again, this may seem like a small step, but the logistics of doing so are quite significant. Moreover, the wildlife agencies were at the time under court-ordered deadlines to list species. Delaying the listings required them to take both a legal and political risk.¹⁴¹

138. Rieke, *supra* note 97, at 360.

139. E-mail from Patrick Wright, Former Director of the California Bay-Delta Authority, to Jody Freeman, Professor of Law, Harvard Law School [hereinafter Wright E-mail] 5 (Oct. 20, 2004) (on file with the *Duke Law Journal*).

140. Wright Interview, *supra* note 128, at 1.

141. By all accounts the political leadership of Betsy Rieke, an Assistant Secretary of Interior, was crucial in convincing the agencies to sacrifice their own short-term interests and coordinate efforts. *Id.* at 1–2. See Nawi & Brandt, *supra* note 39, at 14 (referring to Rieke as “the mother of CalFed”).

The next step toward what would ultimately be the larger CalFed Program was a 1994 Accord among federal and state agencies and crucial stakeholders, reached just before an EPA deadline for imposing water quality standards on the state. In 1992, Governor Wilson had formed a State Water Policy Council from a collection of state agencies with authority over the Delta.¹⁴² This Council, representing the state, and Club-Fed, representing the united front of the four key federal agencies, signed the 1994 framework agreement and Memorandum of Understanding (MOU) that established a plan to cooperate for three years on two key issues: establishing new water quality standards, coordinating water delivery from the state, and federal water projects to ensure sufficient freshwater for the fish.¹⁴³ The agreement also institutionalized a long-term planning entity, which ultimately became the CalFed Bay-Delta Program. The entity was charged with initiating a comprehensive planning process for the Bay Delta, to be overseen by state and federal water officials and key stakeholders.

4. *CalFed's Three Phases.* Over the ensuing five years, a dozen federal and state agencies, together with stakeholder groups, negotiated a comprehensive agreement regarding the conflicts in the Bay Delta.¹⁴⁴ The process was divided into three stages. During Phase I, concluded in 1996, the agencies and stakeholders, helped by CalFed staff, defined the issues confronting the Bay; developed initial principles; and devised early versions of solutions.¹⁴⁵ After public comment and agency review, the initial scope of the negotiations

142. Catherine Hudzik, *Evaluating the Effectiveness of Collaboration in Water Resources Planning in California: A Case Study of CalFed 34* (2003) (unpublished M. L. Arch. thesis, University of California at Berkeley), available at http://www-iurd.ced.berkeley.edu/pub/abstract_wp200306.htm.

143. Nawi & Brandt, *supra* note 39, at 14. The Accord came about because of a number of factors: the political leadership of people like Assistant Secretary Rieke; the willingness of interest groups, frustrated with gridlock, to try a collaborative approach; looming deadlines for ESA listings; and progress negotiating contentious scientific issues related to water quality, which laid the basis for further consensus. *Id.* at 4-5.

144. The key agencies on the federal side were the National Oceanic and Atmospheric Administration (NOAA), FWS, USBR, the COE, and the DOI. On the state side they were: DWR, DFG, the SWRCB (State Water Resources Control Board), and the California Environmental Protection Agency (CalEPA). A number of other federal and state agencies played lesser roles. However, eighteen agencies (both cabinet and subcabinet level) did sign the MOU in 2000. CALFED BAY-DELTA PROG., Programmatic Record of Decision 1 (Aug. 28, 2000), available at <http://calwater.ca.gov/Archives/GeneralArchive/rod/ROD.pdf>.

145. *Id.* at 15.

broadened to include a wide range of Delta-related issues, which were then grouped into seven categories: ecosystem restoration; watershed management; water quality improvements; water transfers; water storage; levee system integrity; and water use efficiency measures.¹⁴⁶

During Phase II, the CalFed and agency staffs prepared a comprehensive programmatic environmental impact statement (EIS), as required by both federal and state law.¹⁴⁷ The agencies consulted with stakeholders through the Bay-Delta Advisory Council (BDAC), a body created to provide public input into the CalFed agencies' decision making.¹⁴⁸ In addition, stakeholders continued to consult with agency officials informally, through numerous meetings around the state. The EIS process helped agencies plan the specific actions that would be necessary to implement the Record of Decision (ROD)—the collection of commitments that the agencies would make to address the multitude of issues in the Bay Delta. As Phase II ended, Gray Davis replaced Pete Wilson as Governor of California. In the background of this transition, negotiations continued, but the Department of Interior's curtailment of pumping from the SWP and CVP, triggered by court orders, threatened to derail the process. At this point, the key players from the state and federal agencies met privately for several months to come to agreement on central key issues.¹⁴⁹

The result, finally reached in 2000, was the ROD—a single coordinated plan for addressing the full complement of water management and allocation issues in the Bay Delta. All twenty-three state and federal CalFed agencies signed a MOU regarding implementation of the ROD in August 2000. Phase III, now underway, involves implementing the ROD.

146. *Id.*

147. See National Environmental Policy Act of 1969 § 102, 42 U.S.C. § 4332(c) (2000) (requiring agencies to issue environmental impact statements); California Environmental Quality Act, CAL. PUB. RES. CODE § 21,002 (West 1996 & Supp. 2005) (forbidding public agencies from approving projects that do not include means to mitigate environmental effects caused by that project).

148. The BDAC was formally chartered as an advisory body and is subject to the accountability requirements under the Federal Advisory Committee Act. Federal Advisory Committee Act, Pub. L. No. 92-463, § 3(2)(C), 86 Stat. 770, 770 (1972), *reprinted in* 5 U.S.C. app. § 3(2)(C)(2000).

149. Patrick Wright recounts this history. Patrick Wright, *Fixing the Delta: The CalFed Bay-Delta Program and Water Policy Under the Davis Administration*, GOLDEN GATE L. REV. 331, 337 (2001); Nawi & Brandt, *supra* note 39, at 15-16.

5. *The CalFed ROD.* The CalFed ROD adopts an integrated approach to simultaneously address all of the issues and interests that have an impact on the Delta. This is a dramatic departure from the historical pattern, in which parties would simply fight for more of the resource, and progress would be made sequentially, if at all.¹⁵⁰ The commitment to integration and coordination of agency activity is expressed not merely in the abstract, but in concrete plans, some of which will be described below. Aside from integration and coordination, the most important animating principle of the CalFed ROD is balanced implementation: in principle, as soon as, or soon after, progress is made on one program objective, progress must also be made on the others.¹⁵¹ The goal is to ensure that no single priority dominates decision making. Needless to say, balanced implementation is crucial to maintaining stakeholder support for the process.

For each of the seven categories, the ROD adopts specific measures. For example, it commits CalFed agencies to expand storage capacity at existing reservoirs and to increase pumping, which addresses the needs of agricultural and residential consumers. The agencies also agree to restore the Delta ecosystem through increased flow and fish passage improvements, which addresses the concerns of environmentalists. In a similar effort at balance, the ROD requires agencies to invest in treatment technologies to improve water quality and also to fund improvements to shore up the integrity of Delta levees.¹⁵² These examples illustrate the ROD's comprehensiveness.

In addition to its substantive commitments, the ROD also creates new cooperative institutions to undertake coordinated joint decision making. It establishes a process for implementation under which one or more federal and one or more state agencies will share responsibility for leading implementation of each program element. This has prompted internal changes within the participating agencies, which have hired program staff to support them in their planning, coordination, monitoring, reporting, and public outreach. The MOU on implementing the ROD also established a "Policy Group" of representatives from all 23 agencies. That group would become the ongoing vehicle for discussing priorities, work plans, and budgets to ensure that implementation proceeded in a coordinated fashion.

150. Nawi & Brandt, *supra* note 39, at 17.

151. *Id.* at 22.

152. Nawi & Brandt, *supra* note 39, at 18–21.

Members were to review agency decisions for consistency with the ROD and make specific recommendations back to the agencies.

Another key principle of the ROD is a commitment to the use of independent and credible science as a basis for decision making. Among other things, the ROD provides for appointment of a Lead Scientist and an Independent Science Board to integrate science into all aspects of the Program.¹⁵³ This approach to science was meant to overcome a history of adversarialism among stakeholders, in which science was used “more for its combat potential than for its analytical qualities.”¹⁵⁴ In the early stages of the CalFed process, each side would advance the science that supported its position, or simply sit back and attack the other side’s science as biased. Even agency scientists had come to be viewed as advocates for one position or another. As a result, credibility on all sides was extremely weak. According to Wright, “to put it bluntly, no one in the environmental community has ever trusted the information generated by the water agencies (DWR and USBR), and no one in the water community trusts the data or conclusions of the fishery agencies.”¹⁵⁵ Thus the main function of the Independent Science Board would be to develop credible sources of information that would inspire confidence among both agencies and stakeholders.

The CalFed ROD also establishes a detailed process for soliciting and implementing stakeholder input. As noted above, it institutionalizes the BDAC,¹⁵⁶ which provides an opportunity for a wide variety of stakeholders to participate in the implementation process. Participating groups include environmental organizations, Native American Tribes, farmers’ associations, and agricultural and urban water agencies. Though different stakeholders have exerted more or less influence at different times in the CalFed process, collectively, they have been a consistent presence.¹⁵⁷ At key moments, stakeholders have stepped up to break logjams and generate policy solutions. In some cases they have even supplied necessary funding.¹⁵⁸

153. *Id.* at 21.

154. *Id.* at 26.

155. E-mail from Patrick Wright to Jody Freeman [hereinafter Wright E-mail] (July 14, 2004) (on file with the *Duke Law Journal*).

156. 5 U.S.C. app. §§ 1–16 (2000).

157. As Nawi & Brandt put it, “Stakeholders have stood squarely in the middle of both the conflict and the resolution.” Nawi & Brandt, *supra* note 39, at 23.

158. For example, to overcome an impasse in the negotiation of the 1994 Accord among the four federal agencies, an environmental group compromised on a water quality standard

Mary Nichols, the former Secretary of Resources in the Davis administration, described the dynamic between BDAC and the agencies in these terms:

At the last meeting of that group, we had presentations from members of the advisory committee to the agencies instead of the other way around. So it's no longer the advisory committee stakeholders sitting back with their arms folded critiquing what the agencies are doing. It's the advisory committee members who have been doing a lot of work between meetings coming to the agencies and telling agencies what they think ought to be done. It's a totally different dynamic, very healthy.¹⁵⁹

6. *The Environmental Water Account.* There are a number of specific examples of stakeholder contributions to policy, but none as significant as their role in the development of the Environmental Water Account (EWA). At first glance, the EWA is a quantity of water set aside specifically to compensate water users when their allocation must be reduced to protect endangered species.¹⁶⁰ Though the concept sounds simple, the EWA is perhaps the most interesting policy innovation to come from CalFed. It merits a thorough description not only because it represents a new approach to managing the Bay-Delta water supply, but because it resulted from an unusually collaborative process.

The EWA is potentially much more than a compensatory water account. Its purpose is to maximize both efficiency and flexibility in managing the water supply so that, in the end, more gets done with less water in response to superior information about where and when it is needed most. This requires operational decisions in what is, essentially, real time, and it depends on the ability to effectively gather and process good data about the likely effects of operational changes in water management and delivery.¹⁶¹ Ideally, improved water

proposal, and the Metropolitan Water District of Southern California provided \$10 million per year for three years for ecosystem restoration. *Id.*

159. *See id.* at 25 (quoting Mary Nichols, former California Secretary of Resources).

160. Of course, environmentalists do not believe this is properly viewed as compensation, because they do not think the other users were legally entitled to their existing entitlement. The question of what ought to be the appropriate baseline entitlement has been a contentious issue throughout the CalFed process.

161. Alf W. Brandt, *An Environmental Water Account: The California Experience*, 5 U. DENV. WATER L. REV. 426, 427-28 (2002). With the EWA, says Wright:

management could allow operators to go beyond what the traditional regulatory regime would envision. For example, they might be able to do more than merely ensure endangered species “survival,” which is the minimum required under the ESA. They could instead provide for species recovery, and even improve the aquatic environment for other species that are not yet listed.¹⁶²

Prior to the development of the EWA, the practice was for the wildlife agencies, pursuant to their authority under the ESA, to set seasonal limits on the amount of water that could be diverted for urban and agricultural uses. These limits were set according to biological opinions that determined the amount of water necessary to support protected species. The impact on the water supply of such limits could be dramatic: if too much water was being pumped out of the Delta, the pumps would need to be shut down, which could wreak havoc with agricultural and urban water supplies. But shutting the pumps down in this way is hardly an ideal approach to supporting the fish, a problem the EWA was designed to address. As Brandt explains,

[s]etting seasonal pumping restrictions by biological opinion under the ESA generally does not allow for a response to constantly changing hydrologic and fishery conditions. Only when project operations exceed ESA take limits do the fishery agencies seek additional pumping reductions, and, at that point, the reductions are often substantial, and are too late to prevent the excess [killing of fish]. With an EWA as collateral, the fishery agencies can call for early and moderate pumping reductions that minimize both the take of listed species and the need for subsequent, substantial pumping reductions.¹⁶³

Ideally then, water allocation would proceed flexibly in response to the changing needs of fisheries and the ecosystem as a whole, instead of in response to the specific regulatory requirements issued

You have a block of water waiting and if the fish are coming in March, you spend half the assets in March. People are actually tracking the fish as they come down. Before CalFed, pumps might be shut down in the middle of growing season with serious and sudden repercussions, and not necessarily in response to the real needs of the fishery.

Wright Interview, *supra* note 128, at 4. Doing this with maximum effectiveness requires enormous amounts of data about, for example, “endangered fish in the Delta and upstream tributaries, hydrology, and project operations.” Hudzik, *supra* note 142, at 41.

162. Brandt, *supra* note 161, at 434.

163. *Id.* at 434.

by fish and wildlife agencies, as was historically the case.¹⁶⁴ To accomplish this, the EWA requires close coordination between so-called “project” or “water” agencies like USBR and DWR, which are responsible for acquiring, storing, and delivering water to users, and so-called “management” or “fisheries” agencies like FWS and DFG, which are responsible for protecting endangered fish. Traditionally, these agencies would never be enlisted in allocating water together. Yet the potential benefits of pooling their expertise are significant. As Nichols puts it,

By getting the right people from the federal and state water agencies and fisheries agencies together in one room, CalFed was able to get them to talk to each other about what each of them really needs. The great breakthrough was when they realized that they didn’t all need the same amount of water all the time. By taking water from the reservoirs only when it’s actually needed to irrigate crops, and leaving water in the rivers when the fish are actually there, it turns out that the same total volume of water can be allocated based on real time information, and each drop can be used much more efficiently. The engineers and biologists started talking about the time value of water. They came up with this new approach because people who don’t normally interact got together to try to solve a problem. You can’t do this by setting a standard. The conventional regulatory process can’t do this.¹⁶⁵

The success of the EWA depends on two things: the development of water assets (i.e., “growing” the water supply by acquiring water from existing water holders or from more efficient use of water projects) and the management of that supply simultaneously for environmental, agricultural, and urban needs. The conflicting demands on the Bay-Delta water supply had historically made doing this virtually impossible.

The events that led to the EWA merit recounting because they perfectly illustrate the collaborative and adaptive learning process—and the institutional innovation to which it can lead—that we think of as modular.¹⁶⁶ When the federal-state Accord was signed in 1994, it

164. *Id.* at 433.

165. E-mail from Mary Nichols, Secretary of California Resources Agency, to Jody Freeman (July 13, 2005) (on file with the *Duke Law Journal*). In this setting, “time value” refers to the time-bound nature of water uses, rather than to economic discounting.

166. Our account relies heavily on the detailed account of the Ops Group and the EWA by Catherine Hudzik. Hudzik, *supra* note 142, at 37–54.

created the CalFed Operations Coordination Group (Ops Group), consisting of the project agencies responsible for managing pumping from the SWP and CVP and the management agencies responsible for protecting fish and wildlife. The Ops Group was charged with implementing the new water quality standards, which meant coordinating water operations to ensure protection of the fish. Although these agencies had already begun to engage in informal consultation, the creation of the Ops Group formalized their relationship. They began to meet monthly, to use the same information, and to make real-time operational decisions—for both water supply and environmental protection—together.¹⁶⁷

The Ops Group consisted of high-level agency staff and some key stakeholders from environmental groups and local Water Districts.¹⁶⁸ It was assisted by two subgroups that fed it information and data. One was the Data Assessment Team, which consisted of agency staff from the management and operational agencies, plus stakeholder representatives. The Team met weekly, analyzed technical data and made recommendations to the Ops Group about modifying project operations. The second was the so-called “No Name” Group, which met on an as-needed basis. This group served as an informal conduit for stakeholder input to the agencies and for agencies to in turn funnel information to stakeholders.¹⁶⁹ According to Connick and Professor Innes, “The idea was that information on fisheries, water quality and flows could be evaluated quickly using the distributed intelligence of the diverse agency and stakeholder members.”¹⁷⁰

The Ops Group encountered some obstacles, in part because of ongoing litigation and ESA listings that put limitations on what it

167. *Id.* at 40.

168. The environmental stakeholders included the Bay Institute, Environmental Defense, and the Natural Heritage Institute. The Metropolitan Water District was the key water user involved. *Id.* at 38.

169. *Id.* at 41.

170. Sarah Connick & Judith E. Innes, *Outcomes of Collaborative Water Policy Making: Applying Complexity Thinking to Evaluation*, 46 J. ENVTL. PLANNING & MGMT. 177, 189 (2003).

Using up-to-the-minute monitoring data, these groups managed the situation on a day-to-day basis. The resource managers made key decisions at the lowest levels possible, elevated unresolved issues quickly and kept all the agencies and stakeholders informed. The decision making was quick and effective, and the process provided a much more nuanced response than the agencies could have provided working independently with inflexible guidelines.

Id. at 190.

could do operationally. And not all of the potentially relevant stakeholders participated regularly. Some lacked the expertise to do so, and others did not buy into the process. By the late nineties the group seemed to be at an impasse over the essential conflict: how to adequately protect the fish without depleting the water supply for other uses. And this was a time of crisis. The Delta pumps were shut down because of ESA listings right in the middle of growing season, which caused a political firestorm of statewide headlines and legislative hearings.¹⁷¹ It was in this context that the EWA emerged.

The idea was initially envisioned at a high-level meeting of key CalFed players by David Fullerton of the Metropolitan Water District. What happened next merits quoting at length:

In this room were all the chiefs of all the water agencies and the fisheries agencies. Then he [Bruce Babbitt, Secretary of Interior under the Clinton Administration] looked at Mike Spear, the regional head of the Fish and Wildlife Service, because the biggest issue was Delta Smelt at the time, and Tim Quinn [of the Metropolitan Water District], the biggest gun in the water supply side, and he said, "Do you two guys represent the rest of these guys?" They looked around and said yeah . . . and he said, "Okay, I'll tell you what I'm gonna do." He looked at Mike and Tim and said, "There's a room at the side over there, and you two guys are gonna go in there. I'm gonna give you 20 minutes, and you're gonna come out of there and tell us whether we have an impasse and we ought to quit, or you've got a way to solve this and you think we've got a process, a way to solve it. You can take anybody in there you want to, but you're going to come out and tell us whether we quit now and just fight." . . . One of them's got the Endangered Species Act on their side, the other side's got 2,500,000 people drinking—and they did, they went off.¹⁷²

What Quinn and Spear proposed, after being sent off to confer by Secretary Babbitt, was the EWA. The Ops Group and its subgroups then developed the concept in over a year of meetings.

The EWA is not the only example of CalFed's institutional innovation. The program has spawned what might be called "submodular" approaches as implementation of the ROD has proceeded. One good example is the South Delta Fish Facilities Forum (SDFFF), which is comprised of representatives from the

171. Nawi & Brandt, *supra* note 39, at 2–3.

172. Hudzik, *supra* note 142, at 45.

water and fishery agencies, as well as nonagency stakeholders. The SDDFF formed to develop a policy alternative to the extremely expensive fish screening and testing facilities that had been proposed by the fisheries agencies as part of the ROD. (The agencies had proposed to spend \$180 million on a test facility to assess the effectiveness of screening technology. The screens needed to be in place before more water could be pumped out of the Delta because the increased pumping threatened fish populations.) The agencies initially took offense at the idea that stakeholders could question their judgments. But the stakeholders proposed a detailed plan to study, test, and evaluate alternative technologies and practices that would provide adequate fish protection at a lower cost. Ultimately, the agencies agreed to participate.¹⁷³

At times, stakeholders have all but supplanted the agencies. For example, the ROD called for developing a water quality plan, but none of the responsible agencies, including the EPA, the SWRCB and the state Department of Health Services (DHS), was eager to take a leadership role. Instead, they remained preoccupied with their narrow statutory mandates, which focus on only a small part of the larger water quality problem. For example, the SWRCB's priority is source control of water pollution. The Board establishes water quality standards, oversees point source regulation and creates programs to control nonpoint source runoff. By contrast, DHS and the EPA set treatment standards for the water coming from taps. Each of these agencies alone can normally address only part of the larger water quality problem, but the CalFed process provided an opportunity to adopt a more integrated comprehensive approach. According to Wright, "no one had assumed responsibility, or was even thinking about, how to protect water quality from source to tap in an estuarine system, or considered the trade-offs involved."¹⁷⁴

The Drinking Water Subcommittee of the BDPAC emerged to fill this void. It proposed an innovative strategy to set ambient water quality targets as either traditional concentration limits or in a manner that would achieve an "equivalent level of public health [ELPH] protection."¹⁷⁵ The strategy calls for improving water quality

173. Wright E-mail, *supra* note 155, at 2; see South Delta Fish Facilities Forum Charge and Background Document (on file with the *Duke Law Journal*) (explaining SDDFF's mission in detail).

174. Wright E-mail, *supra* note 155, at 3.

175. *Id.*

in the tributary waters entering the Delta by adopting water management measures that will reduce seawater intrusion, improving local and regional infrastructure and treatment technology, and establishing regional water quality exchanges—all of which is designed to ensure improved water quality at the tap.¹⁷⁶ This approach, which allows managers to prioritize among the different measures and make water quality improvements in the most cost-effective way, was adopted into the ROD. As with the EWA, stakeholders were crucial to developing a solution when the responsible agencies could or would not do so. Though the agencies participated, the subcommittee took the lead.¹⁷⁷

It is difficult to convey the novelty and ambition of the CalFed ROD with such a short summary and so few examples. The document is remarkable not only for being so broad in scope but for approaching implementation in such an integrated fashion.¹⁷⁸ This may be the ROD's greatest innovation—transforming how decisions regarding the Delta are to be made in the future. The adopted approach built on what the four federal agencies (Club-Fed) had begun in their 1993 Accord: agencies that were accustomed to acting independently, establishing their own priorities, and working on their own timelines were now formally committed to jointly coordinating

176. CAL. BAY-DELTA PROGRAM, WATER QUALITY PROGRAM MULTI-YEAR PROGRAM PLAN (YEARS 6–9) 5–6 (July 2005), available at http://calwater.ca.gov/ProgramPlans_2006/Water_Quality_Final_Draft.pdf.

177.

So for salts, for example, the most cost effective approach might be to relocate agricultural drains and the intakes of the urban agencies that draw supplies from the Delta. But for selenium, it might be to emphasize agricultural drainage management. The key is to look at each option from source to tap. But because no individual agency has the mandate to take this more global approach, stakeholders are providing the leadership and direction through the work of the subcommittee.

E-mail from Patrick Wright to Jody Freeman (May 31, 2005) (on file with the *Duke Law Journal*).

178. There is evidence of such joint activity both within the substantive plan and in the many joint documents incorporated into the ROD. These included

Biological Opinions issued contemporaneously by NMFS and FWS pursuant to Section 7 of the ESA. As a joint federal-state document, it incorporates findings and a certification under the California Environmental Quality Act, as well as the approval by the CDFG [California Department of Fish and Game] of CalFed's Multiple Species Conservation Program. The ROD also includes a programmatic consistency determination under the Coastal Zone Management Act; agreements addressing sections 401 and 404 of the Clean Water Act; operation of the Environmental Water Account, and overall Program implementation; and a conservation agreement regarding the Multiple Species Conservation Strategy.

Nawi & Brandt, *supra* note 39, at 21.

their regulatory, permitting, planning, and funding decisions. The explicit purpose of this coordination is to enable these agencies to achieve not only their own narrow statutory mandates but to accomplish comprehensive projectwide goals that none could achieve on their own.

7. *Institutional Innovation.* CalFed also embodies innovation in institutional form. It began as a loose network of agencies and stakeholders and evolved into a comprehensive and coordinated multiagency effort with commitments formalized in documents like the ROD and the MOU. The ROD anticipated that these commitments would be implemented through a combination of traditional and nontraditional regulatory strategies by the individual agencies using their preexisting authority, with input from stakeholders.

As mentioned, the participants initially created the CalFed Policy Group to assist with implementation. It was co-chaired by the DOI Assistant Secretary for Water and Science and the California Resources Agency Secretary, and it included the heads of the CalFed agencies. As the process developed, however, proposals began to emerge suggesting the creation of a new regional or joint state-federal governance structure. This occurred in response to a general sense that implementing the ROD would require a new institutional arrangement.

Settling on the precise governance structure, however, was contentious.¹⁷⁹ At this point, many stakeholders favored a new government agency, created by legislation, in which they would be entitled to play an active role. The agencies themselves did not want their authority usurped, but each generally acknowledged the need for a coordinating entity that would maintain a commitment to the “core” CalFed values—interagency coordination, balanced implementation, and independent science. This was especially necessary to prevent individual agencies from renegeing on their commitments. Some stakeholders had hoped to create a new entity with cross-cutting authority precisely because they feared that agencies would resist coordination. Other stakeholders with strong working relationships with particular agencies (e.g., water contractors and DWR) feared that a new entity would undermine the power of

179. Wright Notes, *supra* note 119, at 1–3.

“their” agency (indeed, their advocate) in the CalFed process. And lawyers for both state and federal agencies resisted creating a truly new joint federal-state agency because of concerns about the constitutionality and legality of federal and state entities having a say in each other’s activities. This, of course, demonstrates how existing limitations can constrain the options for institutional development.

And yet, these constraints did not foreclose every creative option. The agencies and stakeholders agreed to create the Bay-Delta Authority (BDA), which was charged with playing a coordinating and supervisory role over all of the CalFed agencies. The BDA would not intrude on the “turf” of any of the agencies, impinge on their budgets, or usurp their regulatory power. Structuring the BDA in this way would be a risk. Without regulatory power, it could not force action but instead would need to persuade the agencies to take its advice. It would have to manage a variety of stakeholders and agencies in a highly contentious and politicized environment, without its own constituency of support; if it got into political trouble, who would come to its defense? And handling so many different players without losing credibility would be challenging. Perhaps developing good relationships with some stakeholders or agencies might undermine the BDA’s influence with others. Perhaps its rather informal and experimental mission would make it appear weak or ineffectual. Perhaps it would be seen by some as a useless bureaucratic overlay. Its two primary tasks—to supervise and coordinate—could conceivably come into conflict.

Yet the BDA structure had some obvious benefits. First, and importantly, it was a pragmatic option simply because of its small institutional footprint. No agency had to yield its budgetary authority or shrink its regulatory power. Second, it was seen as a priority to create a coordinating entity in an environment characterized by an almost total lack of coordination. The BDA might accomplish a great deal simply by being an honest broker, a source of information, and a procurer of science. It could educate agencies about each other’s activities, remind them of their commitments, prod them to act or explain their inaction, and provide a forum to connect agencies to stakeholders to whom those agencies might otherwise not be favorably disposed. Moreover, the BDA could help to generate and disseminate credible and relevant scientific data that, because of its independence, would be difficult for the agencies to ignore. Perhaps most importantly, the BDA would uniquely take a projectwide perspective. It would have its own independent staff, which would

come to develop its own culture. Unlike the agencies, the BDA would be unburdened by a historical constituency or client. As a result, it would be free to represent CalFed and its programmatic goals.

In 2002, California passed legislation formally establishing the California BDA as a state entity under the California Resources Agency and institutionalizing its role in CalFed.¹⁸⁰ In its current form, the BDA includes twenty-four members: six representatives of state agencies; six (nonvoting) representatives from federal agencies;¹⁸¹ five public members from different regions of the state; two legislative appointees; and a representative from the public advisory committee (which had been renamed the Bay-Delta Public Advisory Council and formally chartered under the Federal Advisory Committee Act).¹⁸² There are also four nonvoting state members: the Chair and Vice Chair of the appropriate legislative committees in both the Assembly and the Senate. The BDA appointments are high level. On the federal side, they include the Secretary of the Interior; on the state side, the Secretary of Resources. The Authority has approval power over Annual Workplans and activities of the agencies, and it works with the Governor's Office of Finance to coordinate agency spending—an indirect but effective way to influence the traditional budgetary independence of the agencies.¹⁸³ The Authority's official role is to oversee the dozen or more state and federal agencies that will implement the ROD by helping to coordinate and integrate their activities. It has been charged with providing for balanced implementation, tracking and assessing Program progress, and, by

180. California Bay-Delta Authority Act, CAL. WATER CODE, Div. 26.4, §§ 79,400–79,476 (West 2004). On January 1, 2003, the Authority assumed responsibility for overseeing implementation of the Bay-Delta program. In addition, the Authority includes four ex-officio members, two each from the Senate and the House. The Bay-Delta Act calls for the Authority to sunset on January 1, 2006, unless federal legislation has been enacted authorizing the participation of federal agencies in the Authority (who now cannot formally participate).

181. Recently, Congress passed legislation formally authorizing the participation of the federal agencies on the Authority. Water Supply, Reliability, & Environmental Improvement Act, Pub. L. No. 108–361, 118 Stat. 1681 (2004).

182. Federal Advisory Committee Act, Pub. L. No. 92–463, § 3(2)(C), 86 Stat. 770, 770 (1972), reprinted in 5 U.S.C. app. § 3(2)(C) (2000). The Public Advisory Committee is treated as a state advisory committee as well.

183. See Wright Notes, *supra* note 119, at 7 (discussing the important role of the Department of Finance in maintaining balance in spending). Under the new federal authorizing legislation, OMB could play a similar role. Water Supply, Reliability & Environmental Improvement Act § 106.

directing the independent science board to review all program elements, ensuring that agencies use credible science.¹⁸⁴

Remarkably, until this formal institutionalization of the BDA, none of the CalFed activities had been authorized by legislation. CalFed had evolved as “essentially a creature of inter-agency agreements and budget allocations, grounded in its unique ability to perform an essential role in addressing the Bay-Delta.”¹⁸⁵ Now, however, it would become “official.”

8. *How to Account for CalFed.* What, in the end, explains CalFed’s emergence? Rieke’s analysis of the 1994 Agreement, which first institutionalized the CalFed Program, suggests two key factors: a favorable stakeholder environment in which parties not only wanted to reach agreement, but had the expertise, resources, and relationships necessary to contribute to it; and a federal strategy designed to leverage the state into developing a water quality plan. Clearly, without the prospect of mutual gains, the stakeholders would not have come to agreement. The ESA and CWA were critical in this regard because their requirements helped to create a crisislike situation in which it became clearer than ever that a long term plan was necessary. By the midnineties, it was apparent to every stakeholder that, although they could keep blocking one another, without a more collaborative process they would never really advance their long-term interests.¹⁸⁶ The system was clearly broken, and there were feelings of exasperation on all sides. This created an opportunity for something new.

Negotiations were helped along, as Rieke says, by stakeholders that brought both resources and expertise to the table. Indeed, a few local water agencies were as knowledgeable and powerful, in some

184. Authority members are assisted by a fulltime staff, which is headed by a Director. Nawi & Brandt, *supra* note 39, at 7.

185. *Id.* at 28. The BDPAC consists of nine subcommittees on topics ranging from Delta Levees and Habitat to Environmental Justice. Members are drawn from a wide variety of stakeholder groups including environmental organizations, water districts, Indian tribes, farm groups, and fisherman’s associations. *See* CAL. BAY-DELTA PROGRAM, *supra* note 118, at 51–52 (explaining the role of the BDPAC).

186. For example, the ESA is a powerful tool for environmentalists because “listed” species trigger a variety of protections including reductions in pumping, *see, e.g.*, Endangered Species Act, 16 U.S.C. § 1536(a)(4) (requiring agency consultation to ensure that agencies’ actions are not likely to jeopardize listed species), but the statute is ultimately too narrow to address the larger water management issues presented by the Delta. *See* Endangered Species Act, 16 U.S.C. § 1536(a)(4).

respects, as state and federal entities.¹⁸⁷ In addition, California's business community used its clout and knowledge of water issues to help keep the process moving. And environmental groups had sufficient legal and technical resources to "get to the table, remain at the table, and bring independent proposals to the discussions," which is not always the case in conflicts like this.¹⁸⁸

It is important to remember that it took time for these historically adversarial relationships to evolve. The CalFed Program benefited from years of informal discussions among key stakeholders, which helped to inch them forward and position them for reaching a formal agreement. By the time they negotiated the 1994 Accord establishing the Bay-Delta Program, these groups were building on earlier discussions dating to the eighties.¹⁸⁹ Although these earlier discussions had not produced a plan for the Delta, they had helped stakeholders to understand better their mutual interests and identify some initial principles for addressing management of the Delta. These earlier discussions provided the "foundation of technical information, alternatives and relationships" for ultimate agreement.¹⁹⁰ As things progressed, stakeholders became more willing to break old alliances and form new ones.¹⁹¹ For example, urban and rural water users (not usually allies) formed a coalition, in part to balance the pressure from environmental groups.¹⁹²

187. See Rieke, *supra* note 97, at 351 (describing the Metropolitan Water District in Southern California, one of the state's biggest wholesalers of water, as having an annual operating budget nearly as large as the federal Bureau of Reclamation's entire budget for the American West).

188. *Id.*

189. Nawi & Brandt, *supra* note 39, at 11. These discussions came to be known as the "Three Way Process." They began after the Peripheral Canal referendum was defeated by voters and after the California Supreme Court's rejection of the state's water quality standards. The discussions first began between urban and agricultural users. Urban users also opened discussions with environmentalists. *Id.*

190. Rieke, *supra* note 97, at 352.

191. Nawi & Brandt, *supra* note 39, at 11 (recounting how local agencies like the Metropolitan Water District began to work closely with other urban areas like San Francisco, weakening their ties to agricultural users who also received their water through the state pumping system that diverted it from the north).

192. Moreover, many stakeholders took risks. For example, the environmental community yielded on some aspects of water quality standards at a crucial moment. A representative from the agricultural alliance departed from his constituency's traditional opposition to water quality standards and persuaded irrigation districts to work together with an urban coalition. Rieke, *supra* note 97, at 351.

In addition, by 1993, federal agencies had themselves begun to cooperate on Bay-Delta issues, which laid the groundwork for later cooperation between the federal and state governments the next year. During this period, the federal government leveraged its legal authority under the CWA and the ESA to force the state to take primary responsibility for devising a plan. Without those legal levers, the Wilson administration may never have set water quality standards, which had become the crucial sticking point.

Along with the strong sense that the system was broken, the promise of increased funding was crucial to brokering the 1994 Agreement. As Nichols put it,

[Secretary] Babbitt was able to get the Wilson Administration and the ag[ricultural] and urban water agencies to stay at the table by insisting, contrary to all expectations, that the [Clinton] Administration was willing to request huge funds in new California water storage projects, even including dams, if everybody could agree on a whole package.¹⁹³

This was pivotal because there had been no new money for USBR or COE projects in the West for many years.

The prospect of funding was perhaps even more important to the development of the ROD six years later. During this time, stakeholders cooperated to support passage of two water-related bond measures that together raised \$6 billion for water and water-related open space projects in the state, of which CalFed was allocated a substantial share.¹⁹⁴ The ROD was adopted at a time when both the state and federal budget surpluses were at record levels, which was critical to generating support for the program. A final

193. E-mail from Mary Nichols, former California Secretary of Resources (Oct. 10, 2004) (on file with *Duke Law Journal*). Nichols recounts that “Congress simply hadn’t had the money to throw around and environmentalists had joined with Eastern and Midwestern states to define all western water projects as bad pork.” *Id.*

194. CalFed supporters were instrumental in passing Propositions 50, 204 and 13, which produced respectively \$4 billion, \$1 billion and \$1.97 billion, for a total of \$6.97 billion. Nichols describes the bond effort this way:

The Governor wanted to rebuild California’s water infrastructure and the only way to get something on the ballot the first year he was in office was to work with The Nature Conservancy, the Southern California urban interests, and more enlightened water buffalos, so they crafted a bond measure that basically requires a [CalFed]-type approach to funding projects—multi-purpose, “green” water projects rise to the top and get funded quickly, everything else gets studied and has to meet a “beneficiary pays” test. . . . Remember, in California the saying is water runs uphill to money.

Id.

ingredient for success, which cannot be overstated, is leadership. By all accounts, Rieke and her team at Interior, and a variety of important local players like Tim Quinn at the MWD, were crucial to maintaining momentum in the face of repeated setbacks. As the Directors of the Bay-Delta Authority for the last decade, Lester Snow and Patrick Wright played key roles in maintaining that momentum.¹⁹⁵ Thus, though it may be hard to reproduce, CalFed's success is not accidental. It is the product of a potent combination: the favorable stakeholder environment and federal hammer identified by Rieke, along with a significant amount of money and very talented leadership.

B. Evaluating CalFed

1. *A Favorable View.* Our portrayal of CalFed suggests that it has already achieved a unique level of both procedural and substantive innovation simply by coming into being. The process by which it emerged illustrates how interagency coordination coupled with stakeholder participation (lubricated by funding, of course) can lead to more comprehensive planning and reshape a zero-sum struggle into a more multifaceted problem-focused exercise. And it provides a useful example of how informal agreements among actors with preexisting regulatory authority, together with an overlay of new governance structures, can help to overcome some of the limits inherent in a relatively rigid statutory and bureaucratic regime. Without leaving a large institutional footprint, these new governance structures can potentially have a meaningful long-term impact by shepherding agencies that have been historically entrenched in their independence toward greater coordination and collaboration. Finally, CalFed demonstrates how new policy ideas—like the EWA, the SDFFF, and the water quality strategy—can emerge from information-rich, joint problem-solving efforts in which parties that are normally opposed to each other channel their conflict constructively toward generating solutions and alternatives to an unsustainable status quo.

The BDA, while not perfect, has clearly enjoyed some success in coordinating the activities of the CalFed agencies. In a sense, the

195. Although beyond the scope of this Article, it would be useful to investigate whether the presence of this strong leadership was sheer coincidence, or whether it was produced by processes that could be replicated elsewhere.

Authority operates like a building contractor: it determines which projects—ecosystem restoration water supply or levee reinforcement?—must go first, and tries to link schedules to keep progress on track. The Authority crucially provides a forum in which implementing agencies can meet. Indeed, deputy directors from the agencies meet every other week to discuss their upcoming regulatory agenda and to ensure their efforts are in synch. Although this process does not guarantee perfect coordination, it would be impossible to achieve any coordination at all in its absence. And this kind of forum simply did not exist before CalFed.¹⁹⁶

CalFed has also succeeded in delivering concrete benefits to every constituency it serves. The Program has funded groundwater, recycling, and water use efficiency projects that have produced, in just a few years, the water supply benefits of two or three good-sized dams at a fraction of the cost. And it has done so, most significantly, without any opposition.¹⁹⁷ CalFed's ecosystem restoration efforts can be fairly credited with at least some contribution to helping restore salmon runs, which are now healthier. The Program has spent over half a billion dollars on ecosystem restoration, making it arguably the most ambitious such project in the world and laying the foundation for future improvements. Though they may take many years to materialize, the future health of the Delta requires investment now.¹⁹⁸ Over \$3 billion have been spent implementing the range of goals in the ROD: ecosystem restoration, water supply, and water quality projects. Perhaps most importantly, since the inception of CalFed, there have been no pump shutdowns. This stability has been particularly important to southern California, which draws about 40 percent of its supplies from the Delta and which, until the winter of 2005, had been experiencing one of the worst droughts of the century. The benefit of this stability to the state in terms of averted crop

196. Wright Interview, *supra* note 128, at 5.

197. CAL. BAY-DELTA PROGRAM, *supra* note 118, at 8.

198. *Id.* See also Tom Dunne, *Integrating Creativity, Science, and Responsibility*, SCIENCE IN ACTION: NEWS FROM THE CALFED BAY-DELTA SCIENCE PROGRAM, June 2003, at 22, available at http://www.science.calwater.ca.gov/pdf/SIA_cv_rivers_060103.pdf. Professor Dunne observes that:

CalFed is the most creative, most diverse, most likely to be productive, large-scale river restoration program anywhere in the world This is a giant research experiment, all the way from the policymaker down to the person dumping gravel into the river. Nobody's ever done "restoration" on this scale before. . . . [I]t is hard, unprecedented, and is going to require patience.

Id.

damage and other lost revenue, and a healthy bond rating, is measurable in the hundreds of millions of dollars. While no constituency has received all of its demands, the benefits to each one have been substantial. It seems unthinkable, for example, that ecosystem restoration could have occurred on the scale it has without this collaborative multi-stakeholder approach—why would water contractors, who have been historically resistant to every effort to list species under the ESA, ever have agreed to support it?

Implementing the CalFed ROD in a balanced manner has been, without question, a constant challenge. At different moments, one stakeholder group or another has felt that its interests were getting insufficient attention, as when environmentalists object that pumping out of the Delta is increasing per commitments in the ROD but without sufficient progress on water quality standards or ecosystem restoration.¹⁹⁹ Overcoming such conflicts requires updated agreements and timetables and a recommitment to the promised balanced implementation. To address this, in 2004 the Authority adopted a Delta Improvements Package (DIP) that includes a plan for increasing water exports while simultaneously making progress on ecosystem and water quality efforts. The DIP serves two purposes: further clarifying what specific measures are necessary to fulfill the ROD's goals in the Delta and formally recommitting participants to those goals as time passes.²⁰⁰ And stakeholders generated many of the proposals in the package, just as they helped to develop the EWA.²⁰¹

The DIP is notable as well because it resulted in more coordinated activity between the agencies. In the absence of the DIP, the resource agencies (DWR and USBR) would be seeking to increase pumping from the Delta to satisfy their contractors, which might adversely affect both ecosystem restoration and water quality.

199. Interview with Christopher Stevens, Counsel for Bay-Delta Authority (June 30, 2004) (on file with the *Duke Law Journal*).

200. Wright points out that it is extremely useful when dealing with reluctant agencies to be able to point to a signed document and say, "You agreed to do this." Wright Notes, *supra* note 119.

201. Wright E-mail, *supra* note 155, at 1–2.

[The DIP] is the best example of . . . how the ROD's general goals and commitments get translated into specific action plans that require stakeholder buy-in, how the stakeholders themselves developed many of its key elements, and how the Program transformed what was heavily criticized as an insider deal among just a couple of agencies and stakeholder groups into a public transparent process. This started as a stakeholder-driven process, but was transformed into an Authority and agency-driven process.

Id.

The key challenge facing the BDA was to ensure that greater pumping would not undermine the program's other goals. Without the CalFed process, DWR and USBR would have proceeded on their own, by producing lengthy environmental impact statements to explain and defend the effects of more pumping.²⁰² Then they would have negotiated mitigation with the fish and wildlife agencies.²⁰³ The two agencies would have proceeded in a linear and isolated way, regardless of what other agencies were planning to do, even if those agencies were preparing to take steps in the same area at the same time, to address matters like ecosystem health. Because of the CalFed process and the DIP specifically, these agencies instead adopted an integrated approach to planning that established explicit linkages between issues that had to be addressed on a mutually agreeable timeline. So, for example, DWR and USBR agreed not to increase pumping until a plan was put in place by the Regional Water Quality Control Board to ensure that all Delta water quality standards would be met.²⁰⁴ Sequencing like this would simply not have happened prior to CalFed.

The BDA developed Annual Program Plans as another mechanism for giving additional substance to the ROD. These Plans contain the accomplishments, schedules, priorities, and projected expenditures for every element of the program.²⁰⁵ They update the schedules that were set out in the ROD, explain which projects are delayed and why, and account for money spent or not spent. They serve as a feedback mechanism for both the BDA and the agencies, one that forces the agencies to revisit the principle of balanced implementation at regular intervals. The Program plans also help to make the CalFed process more transparent because they are submitted to public advisory subcommittees for review. This review provides an opportunity for regular stakeholder input, which in turn

202. See, e.g., CAL. PUB. RES. CODE §21100(a) (“All lead agencies shall prepare, or cause to be prepared by contract, and certify the completion of, an environmental impact report on any project which they propose to carry out or approve that may have a significant effect on the environment.”).

203. Wright E-mail, *supra* note 139, at 7.

204. *Id.*

205. Some of the workplans are developed by the implementing agencies themselves, some are written by Authority staff, and others are stakeholder driven. “Not surprisingly,” says Wright, “the agency driven plans tend to be those related to traditional agency programs, whereas the stakeholder-driven plans tend to be those that are more innovative and cross-cutting, or where there is no clear lead agency (for example, water quality).” Wright E-mail, *supra* note 155, at 3.

generates important feedback that the Authority appointees can then use to pressure reluctant agencies to move forward. The annual planning process really functions as an accountability mechanism because it requires the implementing agencies to provide explanations for their actions or failures to act.²⁰⁶

The ROD's commitment to balanced implementation has also led to an entirely different approach to grant funding by the CalFed agencies. Traditionally, each agency funded the projects it favored, consistent with its (narrow) statutory agenda. For example, in the context of managing the same ecosystem, the state fish and wildlife agencies and each of the federal fish and wildlife agencies would follow their own established processes, separately setting priorities and distributing money. Stakeholders aggressively lobbied agency officials. Agencies independently ranked proposals and made funding decisions without interagency consultation.

By contrast, under several CalFed Program elements, agencies have now consolidated their grant funding and coordinated expenditures of federal and state money in a single process. For example, in the ecosystem restoration program, nonprofits, universities, local watershed groups, and all other applicants no longer send their applications to an individual agency staffer. Instead, grant-seekers participate in a year-long process that is increasingly Internet-based, highly competitive, transparent, and very selective.²⁰⁷ In lieu of multiple requests for proposals (RFP), the agencies solicit only one. And independent science panels now review the applications, which adds rigor to the process.²⁰⁸ This new approach to funding improves the quality of applications and helps eliminate pork barrel funding.²⁰⁹ Like all aspects of the Program, interagency coordination over funding is an ongoing challenge. Some agency employees resist it because it reduces their independence and control. And legislatures sometimes earmark pots of money to reduce agency

206. In 2004, several of the plans were not recommended for approval by the BDPAC subcommittees, which meant that they went back to the staff for revision. According to Wright, this is another example of how stakeholders strongly influence program implementation. *Id.*

207. According to Wright, only 10 percent of a half billion dollars worth of proposals were originally funded. Wright Interview, *supra* note 128, at 5.

208. For example, the science panels will not approve funding proposals that lack detailed conceptual models demonstrating linkages to program objectives and commitments to monitoring and assessment. *Id.*

209. Interview with Patrick Wright, Former Director, California Bay-Delta Authority [hereinafter Wright Interview] 3 (Feb. 24, 2005) (on file with the *Duke Law Journal*).

discretion. Nevertheless, CalFed can credibly claim to have transformed the allocation of funding for water resources grants in the state.

The Science Program also appears to be a largely successful response to a previously adversarial approach to science, one that appeared to entrench positions rather than inform decision making.²¹⁰ CalFed seems to be the only initiative of its kind in the nation with a governance structure that includes a Lead Scientist and an Independent Science Board reporting directly to the appointed members of the BDA, rather than to, say, the staff director. The Science Program helps lend the BDA credibility in the scientific community. The first science chief, Sam Luoma, was, in the words of one participant, “utterly committed to creating an agency that would both learn and incorporate what it learned into management. The systems he set up for outside review, and his attempts to bring rigor to agency processes, have been commendable and have had real impacts.”²¹¹ Panels of independent scientists from universities or research institutions help to evaluate every aspect of the CalFed Program. And thus far the Science Program seems to have escaped the politicization that has come to characterize federal environmental regulation in recent years.²¹² As a result, it retains unusually high credibility with stakeholders. This is because CalFed’s Science Program is specifically designed *not* to determine the right answer “but rather to focus on areas of uncertainty . . . and to discuss and explain them.”²¹³

The Authority plays an important role, then, in bolstering the use of science to illuminate areas of agreement as well as disagreement. And this occurs, as frequently as possible, early in the decision making process before agency commitments have crystallized. For example, BDA staff members conduct science workshops to help

210. We wish to thank Professor Holly Doremus for helping to focus our attention on this aspect of CalFed. See E-mail from Holly Doremus, Professor of Law, University of California, Davis, to Daniel A. Farber, Professor of Law, University of California, Berkeley [hereinafter Doremus E-mail] 2 (Sept. 16, 2004) (on file with the *Duke Law Journal*) (noting the importance of the science program).

211. *Id.* at 2.

212. On February 18, 2004, a group of top U.S. scientists, including numerous Nobel laureates, published a report and an open letter accusing the Bush administration of suppressing and distorting science for political gain. James Glanz, *Scientists Say Administration Distorts Facts*, N.Y. TIMES, Feb. 19, 2004, at A18.

213. Nawi & Brandt, *supra* note 39.

stakeholders vet scientific data in a neutral forum before regulatory decisions have been made. In one instance, when the federal FWS appeared headed toward listing an endangered species and the state DFG opposed it, the staff arranged a technical workshop on the data itself, rather than on whether listing or not listing was a good idea.²¹⁴ This helped to illuminate the strengths and weaknesses of the data on which the agencies planned to rely, and it did so in a highly public setting.²¹⁵

For all of these reasons, CalFed deserves a significant amount of credit. The challenges before it were, and still are, immense. Everything about the natural and political environment in which the BDA operates is precarious: the Delta is a dynamic system, agencies remain wary of each other and guard their power jealously, and stakeholder groups remain fiercely committed to their interests. Yet CalFed has managed to generate an impressive amount of both procedural and substantive policy innovation in a relatively short time. It provides a useful illustration of many of the features of our concept of modularity.

2. *A Critical View.* Nevertheless, CalFed is very much a work in progress.²¹⁶ The ROD, after five years, has only been partially implemented. Critics might charge that the CalFed experiment is less successful and revolutionary than its supporters think. The history of CalFed arguably shows only that if the stresses are high enough, if budgets are in surplus, and if there are entrepreneurial people in leadership positions, it is possible to develop new, creative institutions that cross jurisdictional and functional lines. Conditions such as these will coalesce only rarely, one could say. Moreover, critics might claim that CalFed's largely procedural innovations go only part of the distance to the ideal of modularity, because modular institutions must

214. Wright Notes, *supra* note 119, at 11.

215. There are other examples as well. When a Delta storage project proposed a feasibility study for building a reservoir, the Authority conducted an independent scientific review that raised serious questions about its feasibility. When water managers proposed increasing pumping from the Delta, and fisheries agencies responded that they ought to build state of the art fishscreens at a cost of \$200 million, the Authority launched a process to explore less expensive options. To do this, the Authority took advantage of expertise in local water districts and convinced the wildlife agencies that they could use the help. *See supra* note 173 and accompanying text.

216. We thank Professor Doremus for voicing many of the concerns we discuss in this section.

improve environmental *outcomes* in measurable ways. CalFed will not be a real success story, one might argue, until there is evidence that endangered fish species are in fact doing better than they would have without the Program, the water supply for cities and farmers is both larger and more reliable than in the past, the delta levee system demonstrably improved, and drinking water safer than ever for human consumption.

Critics might also resist the notion that the CalFed process really helped stakeholders reconsider their positions. One could say that, on the contrary, the legal regime had already established the stakeholders' expectations. For example, the ESA and CWA had created entitlements on the environmental side, whereas irrigation contracts and municipal water needs established entitlements on the extractive side. In this view, CalFed did not strike a new balance among stakeholders or encourage them to reconsider their demands so much as it tried to implement the balance of power among them that had already been struck largely because of background statutes. Seen in this way, even CalFed's procedural innovations seem less impressive. Critics might argue as well that CalFed has not really reduced conflict—certainly not if the absence of litigation is the appropriate criterion. Stakeholders still resort to lawsuits over important CalFed-related decisions.²¹⁷

How do we respond to criticisms such as these? First, as noted above, CalFed has delivered concrete benefits to every constituency it serves, including improvements in water storage capacity, water reliability, ecosystem restoration, and drinking water quality. And this has amounted to billions of dollars in real benefits.²¹⁸ In addition, CalFed's planning process is based on the notion that investing in the future is worthwhile: many of the Program's benefits require more than a few years to come to fruition. For example, ecosystem restoration is a complicated and long-term process that cannot be evaluated within political cycles of two or four years. There will undoubtedly be fits and starts and ups and downs in the ecosystem restoration process. This is simply the nature of the enterprise.

217. Wright Interview, *supra* note 128, at 4–5. Litigation is still occurring—over both the environmental impact statement prepared for the EWA and over whether the splittail, smelt, or sturgeon ought to be on the endangered list. Doremus E-mail, *supra* note 210, at 1.

218. See CAL. BAY-DELTA PROGRAM, *supra* note 118, at 5 (“Nearly 80 percent of the \$2.9 billion invested in CalFed programs in the first four years has gone to efforts that contribute to multiple program objectives.”).

Ecosystems are extremely complex and our knowledge of them dramatically incomplete. Salmon runs have been restored in the Bay Delta in recent years, but other species, such as the Delta smelt, have fared less well. In both cases, CalFed deserves neither all of the credit nor all of the blame.²¹⁹ In truth, the reasons why one species of fish improves while another declines are still unclear, even to the best scientists. Still, this kind of uncertainty calls for more, not less, commitment to studying and experimenting with restoration.

Second, whether CalFed had a meaningful effect on stakeholder perspectives—whether it re-shaped their expectations or simply mediated entrenched positions—is somewhat in the eye of the beholder. CalFed did, however, force participants to adopt a more comprehensive view. The operative question for at least some participants shifted from, “What are we alone entitled to take from this water resource?” to “What do we need the Bay Delta to provide for us collectively?” The answer to the new, larger question was daunting: ecosystem restoration *and* flood control (improving the integrity of the levee system); improved water quality (reducing toxic contamination and excess nutrients) *and* a more balanced allocation of water resources for residential, agricultural, and wildlife uses. The point is not that CalFed led participants to abandon long-held interests, but rather that it broadened the basis of discussion and forced stakeholders or agencies with only one perspective to take seriously the perspectives of others. This may not have changed the underlying conflict, but conceivably it changed how people imagined and talked about solutions. At a minimum, it led for the first time to integrated and coordinated planning. And while this kind of innovation can sound procedural, it has real effects on the ground once agencies begin to implement their agreements.

It is undeniable, however, that the existing legal levers can limit the ability to think about problems in creative ways. As noted in Part I, agency cultures develop pursuant to statutory mandates. They are “sticky” and resistant to change. As Wright says, “even when agencies

219. As Professor Doremus puts it:

The delta smelt might come off the [endangered species] list, but if it does it will be because it has always been a tough fish to understand, not because [CalFed] has made conditions noticeably better. (Same story for the splittail, which had a very brief tenure on the protected list.) There are attempts to say that the [CalFed] program automatically makes the fish better off (I think the FWS may be taking this tack in the smelt status review), but that isn't backed up with either empirical facts or regulatory authority.

Doremus E-mail, *supra* note 210, at 1.

are given a flexible, new tool like EWA, they have great difficulty overcoming their instinct to apply that tool in the traditional, prescriptive way.”²²⁰ By some accounts, for example, the regulatory and operational agencies still focus on pumping operations at the CVP and SWP as the most important reason why the fish are failing when in fact their role in the decline of the fish populations is unclear,²²¹ and habitat factors undoubtedly make an important contribution to the problem. Yet the pumps remain the focus because the regulatory agencies see them as their only mechanism for controlling the system. Manipulating the pumps is familiar, and both agencies and stakeholders have grown used to the occasional shutdown. Some observers believe that the EWA may have had a perverse effect in this regard by intensifying the focus on pumping, which diverts attention from other factors that may be affecting the fish.²²²

In addition, EWA managers appear to be fairly risk averse and continue to hoard the water, expending it only when they are strongly convinced the fish will benefit. And, as we reflected in our description, the dominant view of the EWA is that its purpose is to compensate, even though it has the potential to do more. For example, with the right incentives, managers could be encouraged to be more experimental in allocation decisions, using the water to learn more about the system. This strongly suggests that one measure of success for the process as it moves forward will be the extent to which

220. Wright E-mail, *supra* note 139, at 2.

221. Environmentalists charge that record levels of pumping are responsible for the decline of several species of fish, including smelt and bass. Yet CalFed’s defenders say that no one really knows what is causing the fish to decline and note that the Program has over the same period achieved success in restoring salmon populations. See Bettina Boxall, *Water Accord Said to Be in Peril*, L.A. TIMES, Nov. 7, 2004, at B1 (discussing the ongoing debate); Editorial, *Delta Fish Decline Foretells State Water Woes*, CONTRA COSTA TIMES, May 8, 2005, at F4 (noting that “no one seems to know why the Delta open-water fish seem to be disappearing”).

222.

They don’t want it known (if in fact it’s true) that killing fish at the pumps isn’t what is causing population declines because they fear losing that one handle and not being able to replace it with anything else. The operational agencies have learned to live with occasional pumping restrictions, are getting better at predicting when those restrictions will come (through CalFed and their cooperation with the fish agencies), and with the EWA have a way to make their clients the water users whole when they must impose those restrictions. In that sense, perhaps CalFed has actually had a perverse effect *if our goal is to learn about the system and protect the environment*. Everyone can live with the focus at the pumps, except quite possibly the fish. We need to do a better job of structuring institutions that will force a response to the problem, rather than just to the levers.

Doremus E-mail, *supra* note 210, at 2–3.

it can adopt incentives for moving away from the traditional legal levers, so that the focus is on learning what fish need, rather than what the agencies are used to doing. Nevertheless, despite this continuing challenge, the existing legal regime was successfully supplemented, finessed, or circumvented at several junctures in the CalFed process. Although CalFed has not succeeded in overcoming the background legal regime, it appears to have pushed beyond some of its limitations.

The most difficult problem, not surprisingly, may be maintaining stakeholder support for the Program over time. While the threat of litigation, if used wisely, can help to prompt the CalFed agencies to maintain their momentum, that threat can also be destructive. In fact, efforts on the part of some stakeholders to circumvent CalFed through litigation has exerted a drag on progress. In some instances, there has been, in addition, a “wait until November” attitude among some who think that developments in state or national politics will favor their interests.²²³ Yet, the process has kept going not because most agencies and most stakeholders are deeply committed to it, but because there are sufficient numbers of moderates in each of the relevant communities who are.²²⁴ The ongoing challenge is to maintain and build on this broad-based coalition to provide ballast against those (on all sides) who think they can do better in the conventional regulatory and judicial process.²²⁵

All of this requires commitment over sustained periods of time, which can lead to stakeholder fatigue.²²⁶ Both stakeholders and agencies must stay motivated over a period of years, not months, through different budget and political cycles, and as personnel in both the agencies and the interest groups change. This weighs especially heavily on stakeholders with fewer resources. A shared governance approach like this may give a disproportionate advantage to

223. Wright Interview, *supra* note 128, at 4.

224. Wright Notes, *supra* note 119, at 5.

225. As one example, many in the environmental community still believe that they could do better litigating under the ESA. They argue that CalFed has focused on plans that will increase storage and exports of water at the expense of ecosystem restoration. The counterargument is that the ESA simply cannot accomplish what environmentalists seek and that CalFed has supplied hundreds of millions of dollars and hundreds of thousands of acre-feet of water more than any regulatory/litigation strategy could ever produce. In any event, it would be surprising to hear stakeholders brimming with satisfaction, because they continue to believe that during the implementation phase it is in their strategic interest to remain unsatisfied.

226. Wright Interview, *supra* note 139, at 3.

stakeholders with the resources not only to keep up, but to hire their own technical staff to work with the agencies in developing options and recommendations.²²⁷ And some agencies, like USBR, have closer “client” relationships with their stakeholders which can help those stakeholders stay involved; environmental interests may not enjoy the same advantage.²²⁸ Finally, there may be a tradeoff between transparency and speed: more open, deliberative processes like this can be slower than traditional top-down approaches and can try the patience.

That the Program is dependent on continued support from moderate stakeholders is both a strength and weakness. On the one hand, large policy leaps may be less likely in a context in which the center must hold. As a result, perhaps more radical, and arguably superior, solutions never materialize, or when they do, they might quickly be ruled out. For example, in the ecosystem restoration program, the Authority has largely abandoned land acquisitions and chosen instead to procure easements because opposition to purchases is so strong among local governments and agricultural interests.²²⁹ At the same time, however, the checks and balances among the stakeholders and agencies, and between the state legislature and Congress, have been absolutely critical to the program’s success. Without consistent pressure from all sides forcing the players through the CalFed process, the Program’s stability would be threatened. Until recently, no major stakeholders had a viable alternative to CalFed. Although some groups have pursued litigation on individual issues, for the most part, they have been unable to do complete end-

227. *Id.* According to Wright, the environmental and public interest groups have a hard time even keeping track of the program’s activities, and thus tend to be much more reactive. “It’s also their culture,” he says, “to expect that the agencies will do their jobs according to the traditional model even without their involvement.” *Id.*

228. In the case of CalFed, the issue is compounded by the historically close relationship between USBR and DWR and their contractors: “Because they view their contractors as their primary customers, they meet frequently to share information and shape policy. This relationship generally does not exist between the fisheries agencies and the environmental community.” *Id.* The relative ability of the water users to influence the process erupted into the media in the fall of 2004, when environmental groups complained that they were being shut out of deals brokered between the users and the agencies. *See, e.g.,* Boxall, *supra* note 221 (describing the controversy); Stuart Leavenworth, *Major Shift Mapped for Delta Water*, SACRAMENTO BEE, Sept. 26, 2004, at A1 (quoting an environmentalist reacting to being shut out of recent talks as stating that “[i]t is clear that major agencies are acting outside of CalFed”).

229. Wright Interview, *supra* note 139, at 3.

runs around CalFed through state or federal administrative or legislative action.²³⁰

As this Article goes to press, however, the consensus support for CalFed has begun to weaken, exposing its political vulnerability. CalFed has always enjoyed very strong state and federal support: the Wilson and Davis administrations in California provided leadership in the face of stakeholder opposition, and the Clinton administration signaled its consistent support for the Program through the active participation of Secretary Babbitt, who regularly attended high-level meetings and helped to broker impasses. Yet times have changed. The Bush administration has resisted cooperative efforts with the state for reasons that are not entirely clear.²³¹ For example, although Congress recently passed legislation authorizing federal agency representatives to vote at BDA meetings (giving them authorization they previously lacked, which had limited their effectiveness), the Bush appointees from these agencies only rarely attend Authority meetings. The relative indifference of the Bush administration to CalFed, compared to its predecessor, is plain to participants.²³²

At the same time, the new Governor, Arnold Schwarzenegger, does not appear to be as committed to CalFed as previous Governors.²³³ His administration has never thrown its weight behind CalFed as a Program or the BDA as a governance structure. The reasons for this are a matter of speculation. The Schwarzenegger administration seems, as a general matter, to disfavor independent boards and commissions like the BDA—the Governor called in 2004 for a massive state re-organization, called the California Performance Review, to eliminate most of these independent entities and integrate their functions into existing executive agencies.²³⁴ The BDA is even

230. *Id.*

231. It appears that the administration prefers to settle disputes with water contractors privately, through litigation, without engaging a multistakeholder process. *See* Interview with Patrick Wright [hereinafter Wright Interview] (July 19, 2005) (describing the relative infrequency with which federal agency officials attend Authority meetings).

232. *See id.* (citing the lack of federal leadership and noting that it's "not a coincidence that under [President] Clinton there was [a] strong presence from [Secretary] Babbitt").

233. *See* E-mail from Paula Daniels, Regional Member of the Bay-Delta Authority, to Jody Freeman [hereinafter Daniels E-mail] (July 28, 2005) (noting the general lack of leadership and support from the Governor's office felt by members of the BDA) (on file with the *Duke Law Journal*).

234. *See* Jody Freeman, Editorial, *Schwarzenegger's Power Grab: Reform Proposal would Hand Many Key Decisions to the Governor's Appointees*, L.A. TIMES, Aug. 9, 2004, at B11

more unusual in its governance structure and mission than the majority of California's independent agencies, so it is possible that the Schwarzenegger administration is simply flexing its executive muscle and wishes to integrate the BDA's functions into an executive agency like the DWR. It is also possible that the administration, which inherited the BDA and had no political stake in its creation, simply does not know what to make of it.

It is in this context—the context of a relative leadership vacuum—that in recent months the Program has come in for a scathing round of criticism. Despite substantial investment in species recovery, environmentalists have charged that not enough is being done to protect endangered species and insist pumping should slow until the species recover.²³⁵ Water users, meanwhile, complain that no new reservoirs have been built and push for a commitment to increase pumping capacity, even though CalFed-funded water conservation projects have yielded the same benefits as two or three good-sized dams at a fraction of the cost. None of these criticisms and demands is especially new, but in the past they have been met with strong resistance from both the state and the federal governments. Individual CalFed agencies knew that they could not circumvent the CalFed process and strike private deals with stakeholders without being brought up short. At critical moments, attempts by one or the other interest group to do such end-runs would be met with a firm message that the process to use—the only process—was CalFed.²³⁶

Support from the Schwarzenegger administration and the California legislature is particularly necessary in late 2005, as CalFed begins to run out of money. It was extremely fortunate that the CalFed ROD was adopted at a time when both the state and federal budget surpluses were at an all time high.²³⁷ CalFed supporters managed to pass three water-related bond measures for CalFed in the first four years of the program,²³⁸ which generated almost \$3 billion in

(describing the California Performance Review and criticizing the governor's attempt to take control of independent agencies).

235. See *supra* note 221.

236. Interview with Mary Nichols (July 19, 2005) (on file with the *Duke Law Journal*).

237. Wright Interview, *supra* note 128, at 3. The CalFed agencies have spent roughly three billion dollars in the first four years following the adoption of the ROD. CAL. BAY-DELTA PROGRAM, *supra* note 118, at 5. That money may not have been available if the timing had been different.

238. Of the \$6 billion raised for water projects in the state from Propositions 50, 204, and 13, CalFed was allocated approximately \$2 billion. The program has thus far spent \$400 million

funding for CalFed. Most of that funding has already been spent, as noted, on program implementation: groundwater, recycling, and other water conservation projects designed to shore up water supply reliability; ecosystem restoration projects; and water quality improvements. Yet the bond money has nearly run out and there is now significant disagreement over how, and at what level, to continue to fund the Program.²³⁹

In late 2004, the BDA proposed a ten-year, \$8 billion financing plan. The plan calls for a combination of state and federal monies as well as user fees, which are designed to ensure that the farmers and cities that benefit from increased water supply reliability pay their fair share of the program's costs. Such fees would help to ensure the future financial stability of CalFed in the face of a state budget crisis.²⁴⁰ To succeed, however, the finance plan would require the political backing of both the state legislature and the Governor, which has not been forthcoming.²⁴¹ Governor Schwarzenegger had originally promised to support the BDA's plan but ultimately reneged and instead called for CalFed to be audited and scaled back.²⁴² The Governor's decision sent a powerful message to the Authority, most of whose public appointees were not even consulted,²⁴³ that its role

from Proposition 50, \$385 million from Proposition 204, and \$440 million from Proposition 13, for a total of approximately \$1.2 billion. As a result, just under \$1 billion remains from these bond funds. CAL. BAY-DELTA PROGRAM, *supra* note 118, at 56. See *supra* note 194 for a description of the bond effort.

239. See Jody Freeman, *Why is Arnold Afraid of the Water?*, L.A. TIMES, Aug. 21, 2005, at M1 (describing the Bay-Delta Authority's proposal to impose user fees on farmers and cities to finance the plan, and describing the Governor's resistance to user fees).

240. The Authority's financial plan, including user fees, had been painstakingly negotiated among all the stakeholders. User fees are contentious but they were envisioned in the original ROD. See Wright Interview, *supra* note 231 (discussing the negotiation of the finance plan).

241. See Freeman, *supra* note 239 (describing Governor Schwarzenegger's decision to renege on a commitment to support user fees and the legislature's decision to attack the Bay-Delta Authority's plan); see also Bruce Babbitt & Douglas Wheeler, *The Fluid State of Liquid Politics*, L.A. TIMES, Aug. 23, 2005, at B13 (explaining the contentiousness over user fees and providing a rationale for cost sharing among users and the public).

242. See Freeman, *supra* note 239 ("The governor was expected in May [2005] to issue his proposals for user fees and defend the water-sharing program. Instead, Schwarzenegger further delayed his proposals and called for the program to be audited and scaled back."); Dana Nichols & Hank Shaw, *Departure Called 'Serious Blow,'* STOCKTON RECORD, May 26, 2005 (citing Governor Schwarzenegger's "plan to review all of CALFED's efforts and come up with a new, 10-year plan for the program by Nov. 1[, 2005]"); GOVERNOR'S BUDGET 2005-06, 3940 WATER RESOURCES CONTROL BOARD (Jan. 10, 2005) (citing decreased funding for CalFed as a "Major Program Change"), at <http://govbud.dof.ca.gov/StateAgencyBudgets/3890/3940/department.html> (last modified Jan. 7, 2005) (on file with the *Duke Law Journal*).

243. Daniels E-mail, *supra* note 233.

would be further reduced.²⁴⁴ Authority Staff Director Patrick Wright and Chief Scientist Johnnie Moore resigned.²⁴⁵ For their part, legislators attacked the finance plan as totally unrealistic—citing the Governor’s lack of support—and threatened to cut funding to CalFed to “life support levels,” declining the opportunity to act independently to approve user fees legislatively.²⁴⁶ Neither the Governor nor the legislature appears to be willing to support user fees, which have long been contentious, because they are vulnerable to being viewed as a “tax.”

These recent events have made clear that some of the potential strengths of the BDA have turned out to be weaknesses as well. The BDA has no powerful client constituency to defend it, but virtually every agency and stakeholder has reasons to oppose it. How does one defend an entity that no one has heard of, that operates by jawboning and cajoling, on grounds that it does things like “make better science available” and “improve a complex planning process” when people are pointing to dead fish in the Delta? Its dual charges—to coordinate agency action but also to supervise the agencies and hold them accountable—may be incompatible. In the coming months, the BDA may be restructured to address this kind of problem, or simply eliminated in favor of allowing the DWR to absorb CalFed. The Governor asked the state’s Little Hoover Commission to study the

244. Some state officials and water contractors have been suggesting that DWR take over most of CalFed’s operations. To the delight of the water contractors who stand to gain from this move, DWR staff are currently overseeing the Authority staff and the Independent Science Program. Subsuming CalFed into an existing agency such as DWR is likely to undermine some of its best features: independence, innovation, transparency, and flexibility. DWR has always been an agency that serves its water user clients. It is hard to imagine that the agency can manage the SWP, which pumps and delivers water to its client users, and simultaneously manage the water supply for the wide variety of other goals and interests that are part of the CalFed program. Conflicts among the narrow perspectives of the agencies were the driving force behind CalFed’s creation in the first place.

245. Nichols & Shaw, *supra* note 242; Press Release, State of California Resources Agency, CalFed Director Patrick Wright Reassigned to Resources Agency (May 25, 2005), available at http://calwater.ca.gov/Newsroom/NewsReleases_2005/Resources_Agency_Wright_Grindstaff_Announcement_5-25-05.pdf.

246. Mike Taugher, *Despite Spending Billions, CalFed Can’t Fix Delta*, CONTRA COSTA TIMES, May 1, 2005, at F4. See *Miller Demands Answers on Delta*, CONTRA COSTA TIMES, May 7, 2005, at A1 (noting that the BDA released an \$8 billion 10-year plan); Hank Shaw, *Closing down CalFed; Funding for Delta Water Project Likely to Get Yanked*, STOCKTON RECORD, April 20, 2005 (quoting State Senator Sheila Kuehl as saying, “CALFED is doomed to a pretty thin gruel for funding this year”).

program and make recommendations, a process that is ongoing as this article goes to press.²⁴⁷

Still, despite these developments, the CalFed story contains the seeds of a truly different approach to complex environmental and natural resource management problems. CalFed suggests at least the possibility of overcoming the traditional fractured regime. The challenge, as with all aspects of such a complex process, is to see down the road to what will be necessary at each stage of implementation, and to build alliances strong enough to overcome inevitable resistance from one quarter or another. It may not be possible to insulate experiments like CalFed from political and economic swings for long enough to see what they can accomplish. Recent events only underscore how fragile these efforts are. Yet despite its imperfections, and regardless of its future, CalFed has already provided a powerful illustration of what we think of as modular environmental regulation.

III. TOWARD A THEORY OF MODULARITY

In this Part, drawing on our CalFed case study, we distill our modular theory into its basic building blocks. We also draw on promising analogies of modularity from other contexts. In the final Part, we consider some obstacles to the more general emergence and proliferation of modular environmental regulation.

A. *The Constituent Parts of Modularity*

A key aspect of modularity is flexibility and coordination, both within and across agencies and among levels of government. In addition, modularity envisions that these agency parts and subparts will interact with a host of private actors. Further, modularity requires that institutional form follow function wherever possible, meaning that the goal of the modular enterprise is first to diagnose problems and second to devise solutions and match institutions capable of implementing them. Modularity also features agreement-based regulation in addition to more traditional regulatory tools. It also depends upon and promotes social learning. Modularity requires, in addition, adaptive processes capable of generating and incorporating

247. Letter from Governor Arnold Schwarzenegger to California's Little Hoover Commission (Jan. 6, 2005), *available at* http://cpr.ca.gov/pdf/lhc_letter.pdf.

new information. Finally, modularity demands multiple avenues for stakeholder participation. All of this is well illustrated by CalFed.

1. *Overcoming Regulatory Fracture Through Coordination.* By laying the basis for greater interagency coordination, modular structures help to overcome the fractured assignment of regulatory power that generally characterizes environmental regulation and natural resource management. As we have argued, the current structure of cooperative federalism and the narrow focus of agencies that have an impact on environmental resources impedes attempts to engage in integrated environmental planning and implementation. The diffusion of authority across agencies at all levels of government can result in a vacuum of leadership for larger, systemwide problems.²⁴⁸ In the CalFed example, the EPA focuses on water quality, fish and wildlife agencies focus on species protection, and water agencies deal with supply. There are also procedural aspects of the administrative process that can impede collaboration. For example, in Rieke's view, the federal primacy and relatively closed nature of the ESA consultation process, which has no public participation component, makes stakeholders feel excluded and allows states to argue that federal agencies improperly interfere with state resource management prerogatives.²⁴⁹ Rieke also recounts how other, more generic aspects of the administrative process can polarize stakeholders. For example, prior to CalFed, the federal government had traditionally conducted oversight of state water quality standards primarily through rulemaking, which does not lend itself to cooperative engagement with states and stakeholders across multiple

248. These divisions make it difficult to respond to complex environmental problems. This is especially true if the environmental problem itself crosses jurisdictional boundaries (e.g., between states), but even when it does not, divided authority over a single resource can lead to enormous coordination problems. Things become yet more complicated where the environmental problem involves more than one medium, or when a single resource, such as water, has multiple environmental effects. Moreover, as we have argued, the interactive and second order effects of environmental harms can be very difficult to control with media-specific approaches. Frequently, attempts to remediate one environmental problem simply result in substitution or transfer of a different problem to another medium, as when scrubbers remove toxic air pollutants only to create a toxic sludge by-product, which must be deposited on land; or when fuel additives designed to produce cleaner burning fuel contaminate drinking water supplies, as with MTBE. See generally Paul Weiland & Robert Vos, *Reforming EPA's Organizational Structure: Establishing an Adaptable Agency through Ecostate Regions*, 42 NAT. RESOURCES. J. 91 (2002) (proposing a more flexible agency approach for the EPA).

249. Rieke, *supra* note 97, at 357–58; see Endangered Species Act of 1973 § 7, 16 U.S.C. § 1536 (2000) (explaining the consultation process).

issues.²⁵⁰ In describing the rulemaking process, Rieke echoes others who criticize rulemaking: “Each side stakes out a public position that it tends to defend against all criticism. Both the state and the regulated community feel excluded from meaningful participation in the policy formulation process.”²⁵¹

Interagency coordination can come from transforming a conflict into a set of questions about a problem. For example, instead of separating water allocation from water quality issues and assigning them to different agencies, the CalFed process bundled these matters together, which helped to shift things from a zero-sum conflict to a set of problems that required an integrated and coordinated approach. This is what we mean by adopting a “problem-shed” focus. Instead of circumscribing their reach geographically (i.e., by focusing on what each agency could physically control) and observing jurisdictional boundaries (i.e., by focusing on what each agency was legally authorized to control), agencies and stakeholders began to think more comprehensively about the collection of problems and activities that contributed to the inability of the Bay Delta to perform its desired functions. Former Resources Secretary Nichols describes the shift in terms of framing: “It focused on who is doing what with the water. The wrong question is, ‘Can we regulate them’? The right question is, ‘Who is contributing to the problem’? And we worry about what to do later.”²⁵²

Similarly, instead of looking at each agency’s narrow statutory mandate (e.g., at the federal level, the EPA regulates water quality, whereas DOI and DOC manage endangered species protection), CalFed adopted a broader approach: “You say to each agency, even if this isn’t your responsibility historically, you too should participate in the decision.”²⁵³ The purpose of this exercise was to explore the capacity of the Bay-Delta system, determine the range of demands placed on it, and then devise a plan for satisfying those demands. Ideally, such an inquiry would proceed without initial regard for traditional jurisdictional or legal limitations. And to some extent, for

250. Rieke, *supra* note 97, at 357.

251. *Id.* This is by now a familiar criticism of traditional agency rulemaking procedures. See Freeman, *supra* note 6, at 3 (pointing out the shortcomings of the traditional notice and comment process); see also Harter, *supra* note 51, at 7 (proposing negotiations between affected parties in lieu of formalized rulemaking procedures).

252. Nichols Interview, *supra* note 165.

253. *Id.*

some periods during the CalFed negotiations, these appear to have been pushed to the background. Of course the default legal regime still affected the participants' perception of their entitlements. It seems fair to say that the nature of the undertaking changed with CalFed. No longer could each stakeholder maintain its single-issue focus. Neither could agencies ignore aspects of the Delta on the theory that it was some other agency's problem.

2. *Form Following Function.* Modularity requires that form follow function. We mean this as both a logical interconnection and an evolutionary one. This is exemplified in the CalFed process. The first federal attempt to adopt a more integrated regulatory approach to Delta issues resulted in an institutional overlay that took the form of Club-Fed, the four-agency commitment to coordinate regulatory activities. This evolved organically and iteratively in response to failures of the background regime embodied in the statutes:

There was no comprehensive procedural framework agreed upon in advance and designed to be implemented in a step-by-step manner. Rather, the components of the overlay emerged on an ad hoc basis. Whenever it was clear that the existing mechanisms were inadequate, a new component was devised to address the unresolved problems.²⁵⁴

This same step-by-step institutional innovation developed during negotiation of the ROD, which ultimately resulted in creating the Policy Group, which in turn expanded and became formally institutionalized as the Bay-Delta Authority. The CalFed process had generated a new governance structure, but this occurred only after the components of a comprehensive plan made the need for that structure clear. The BDA was designed neither to replace agencies nor to merge them. It was not created to compete with them for funding or intrude too heavily upon their budgetary authority. Instead, the BDA was to add value primarily by coordinating and facilitating action while taking the long and systemwide view. Although the BDA was not given control of member agencies' budgets, in practice, the requirement that the program's implementation activities be balanced among the various program objectives arguably established a significant constraint on the

254. Rieke, *supra* note 97, at 358–59.

agencies' traditional independence.²⁵⁵ This requirement conceivably allows the BDA to point out that some programs are significantly underfunded compared to others, which could influence funding allocations in the following year.²⁵⁶ With sufficiently expert staff to make recommendations credible, sufficiently high-level appointments to lend them authority, and carefully tended public input to ensure responsiveness and accountability, institutions like the BDA represent a promising innovation.

CalFed offers the best example of form following function in environmental and natural resource management contexts that we have come across. There are other examples of governance structures emerging in a seemingly similar way (the Chesapeake Bay Program comes to mind), but none with which we are familiar have managed to do this while also accomplishing the other things we have identified: interagency coordination, agreement-based regulation, social learning, adaptation, and extensive stakeholder participation. Most of the initiatives with which CalFed might be compared involve one or two of these features, and most remain driven by one key (and usually federal) agency.²⁵⁷

255. See *supra* notes 179–83 and accompanying text.

256. For example, in Years 1–4 of CalFed, ecosystem restoration projects received \$653 million and water conservation recycling projects received \$486 million. In contrast, levee restoration projects received just \$83 million and drinking water projects received just \$93 million. CAL. BAY-DELTA PROGRAM, *supra* note 118, at 56.

257. While we cannot do a comprehensive comparison here, many other programs, such as the Great Lakes National Program and the Everglades Restoration Program, appear to be multiagency efforts but are in fact driven largely by a single agency. See Stephen S. Light et al., *The Everglades: Evolution of Management in a Turbulent Ecosystem*, in BARRIERS & BRIDGES TO THE RENEWAL OF ECOSYSTEMS AND INSTITUTIONS 103, 114 (Lance H. Gunderson et al. eds., 1995) (“The federal operations or participation in water management in the Everglades has been historically entrusted to the U.S. Army Corps of Engineers”); THE COMPREHENSIVE EVERGLADES RESTORATION PLAN, THE DEVELOPMENT TEAM (stating that “[d]evelopment of the [Everglades] Plan . . . was led by the U.S. Army Corps of Engineers, Jacksonville District [while] many other federal, state, tribal and local agencies were active partners” in its development), at http://www.evergladesplan.org/about/rest_plan.cfm (updated June 2002) (on file with the *Duke Law Journal*); U.S. ENVTL. PROTECTION AGENCY, GREAT LAKES REGIONAL COLLABORATION: FACT SHEET ON THE BUSH ADMINISTRATION ACTIONS IN THE GREAT LAKES REGION (identifying the EPA as the lead agency in the Great Lakes National Program), at <http://www.epa.gov/glnpo/collaboration/taskforce/factsheet.html> (last updated March 22, 2005) (on file with the *Duke Law Journal*). Of those initiatives that do feature a greater degree of interagency coordination, none appears to cover the multiple objectives that CalFed does. For example, they may focus on ecosystems without dealing with water supply and reliability.

3. *Agreement-Based Regulation.* A modular structure's authority is derived from the participants, and it can only operate on the basis of their agreement. Throughout the CalFed process, agreements, both formal and informal, appear more prevalent than rules, limits, and prohibitions. Not that rules are unimportant. As agencies turn to implementation, they rely on their traditional regulatory authority and will of course employ the conventional tools of regulation. But these are not the focus of discussion initially. Because modularity amounts to a movement toward agreement-based regulation and management, it shifts the regulatory spotlight to a host of instruments that do not generally attract much attention in either administrative or environmental law. These include RODs, MOUs and Memorandums of Agreement (MOAs), Annual Work Plans, and even things called "Packages," which serve to memorialize commitments. The range of potentially useful agreement-based instruments is quite broad. In addition to those used in the CalFed example, one could imagine bilateral interagency agreements, interstate compacts, and multistate or regional resolutions.

How general or specific should these agreements be? Who ought to sign them? What are the accountability mechanisms for ensuring that commitments are kept? How should they be updated over time?²⁵⁸ These are the kinds of questions modularity situates at the center of environmental regulation and resource management. Again, the focus on agreement does not preclude a further and equally important set of questions about which tools to use for implementation. Indeed, it lays the groundwork for this second stage. One can imagine, for example, an ecosystem restoration plan depending in part on traditional standard setting for point sources of water pollution, in part on creating an effluent trading program to help reduce nonpoint source pollution, and in part on a cooperative effort among agencies to divert water in real time in response to the demonstrated needs of competing users.

Sometimes, moreover, a "regulatory" or "management" solution will emerge that seems unfamiliar. What, after all, is the EWA? It operates like a bank account of water, on which customers can draw,

258. As we saw with CalFed, agreements require regular updating to recommit participants to their agreements and to allow for greater specificity as things change over time. *See supra* note 200 and accompanying text. We imagine a kind of "iterative agreement regime," in which existing agreements provide enough stability for work to move forward, but where, over time, they become stale.

yet there is a baseline amount of water that the CalFed agencies have agreed to set aside for fish. And these minimum amounts are based, in part, upon what statutes and regulations would have required in the traditional process.²⁵⁹ The EWA depends, therefore, on the background legal regime for its baseline. Yet ultimate allocations will depend on competing needs in circumstances that are quite dynamic. This is not a conventional prescriptive tool, nor is it a functioning market-based instrument.²⁶⁰

Interestingly, there is not an Administrative Procedure Act “agency decision” to be found here: no rulemaking, no adjudication. Instead, we find a collection of expert agency staff from different (historically opposed) agencies, receiving input from different (historically opposed) nongovernmental stakeholders, who are themselves neither elected nor appointed, exercising discretion in real time based on imperfect and regularly updated data, all answering to a coordinating “Authority” comprised of federal and state officials together with “public” appointees, which is counseled by a public advisory body but which has no independent regulatory power! This is not what we are used to in administrative and environmental law. This is modularity.

We would expect, in an agreement-based system, to see a mix of implementation tools that are as flexible and problem-derived as the initial agreements on project goals. But the choice of tools flows from the identification of the key principles, which take the form of mutual promises. In the context of negotiating a comprehensive agreement, the idea of an abstract preference for “market” versus “prescriptive” tools seems both premature and nonsensical. Implementation might involve traditional rulemaking and permitting, but also, conceivably, market trading schemes and information-forcing mechanisms, all deployed in an organized way to implement different aspects of a comprehensive plan. Although dimensions of the plan might ultimately be promulgated as traditional regulations, other aspects may take the form of quasi-contractual and relatively informal instruments. Similarly, participants in modular systems need to think creatively about funding. They may draw on a variety of financing

259. Brandt, *supra* note 161, at 439.

260. An economist might propose a market mechanism as an alternative, but we doubt that such a market would be feasible because the rapidly shifting information base would make stable entitlements difficult to create. It would also be difficult to distribute initial entitlements to environmental participants.

tools, including federal and state appropriations, user fees, taxes, self-supporting bonds (which California uses to help support CalFed),²⁶¹ or perhaps in some cases, power revenues.

Modular regulation relies, therefore, on a broad range of both regulatory tools and funding mechanisms to supplement the more traditional regulatory tools with which we are relatively familiar. And implementing these tools will require parties to negotiate agreements that look as much “contractual” as they are regulatory. As we saw with CalFed, these agreements have the advantage of flexibility. They can be modified more easily than rules. Yet this flexibility also presents a challenge because agreements must be updated on a regular basis. The revision process can serve important functions, however. It can remind parties of their commitments, force them to account for their actions, and incorporate new priorities and information as it develops over time.

4. *Facilitating Social Learning.* Modularity facilitates learning and incorporates useful information into decision making processes. Advocates of “adaptive management” routinely call for this kind of information-rich process.²⁶² Yet it can be difficult to find good examples of it, in part because contemporary environmental regulation and natural resource management have been shaped by a legal regime that too often promotes the careful hoarding of information and fails to build in mechanisms for environmental agencies to learn from their actions.

Modularity both depends upon and promotes “social learning,” which usually arises in more deliberative or collaborative processes in which participants with different perspectives interact, exchange information and arguments, and become open to the reformulation of goals and/or strategies.²⁶³ When we say “become open,” we do not mean anything magical, only that in settings like this, the presentation of data and argument can lead people to change their minds, especially when the alternative to working together is highly

261. See Connick & Innes, *supra* note 170, at 185 (noting that “otherwise opposing stakeholders jointly developed and publicly supported two major statewide ballot initiatives to raise nearly \$3 billion for environmental restoration, water quality improvement, water use efficiency and water supply facilities”).

262. E.g., KAI N. LEE, COMPASS AND GYROSCOPE: INTEGRATING SCIENCE AND POLITICS FOR THE ENVIRONMENT 8–9 (1993).

263. On the concept of social learning, see Daniel Fiorino, *Rethinking Environmental Regulation: Perspectives on Law and Governance*, 23 HARV. ENVTL. L. REV. 441, 459–64 (1999).

undesirable (e.g., continued stalemate or very costly adversarial options with high uncertainty as to outcome). This approach departs significantly from the adjudicative model that has long dominated environmental regulation and natural resource management. It moves away, that is, from a system focused on resolving which party is right, in favor of a deliberative model focused on determining what to do and how best to do it.

In settings conducive to social learning, the participants might interact in a number of ways—direct and indirect, formal and informal—and “not just in the highly structured ways associated with conventional rule-making.”²⁶⁴ The purpose here is to move beyond a more traditional understanding of agency process, one in which interest groups submit their views to an agency charged with receiving them—a process that suggests unidirectional information transmission with little opportunity for substantive and flexible give and take, and in which all of the participants see the agency as retaining exclusive ownership over the key matters to be decided.

To encourage the social learning that is necessary for modularity, participants must maximize opportunities for both sharing and developing information together.²⁶⁵ Conceivably this information would include not only technical and scientific data, but also information about industrial processes or agency practices, along with background information about assumptions, interests, and perspectives. Under the proper circumstances, changes in viewpoint within such groups can occur “mainly as a result of processes much more like the deliberative model than like the groupthink model emphasizing social conformity.”²⁶⁶ The best group decisions seem to result when the parties are operating under “flexible rigidity,” with high thresholds for acceptable outcomes.²⁶⁷ Ideally, such an approach substitutes a problem orientation for the traditional focus on competition, while at the same time giving participants “a relatively high minimum outcome they should be willing to settle for.”²⁶⁸ Stringent prescriptive regulations can play an important shadow role

264. *Id.* at 460.

265. Fiorino, *supra* note 263, at 460; *see also* Freeman & Langbein, *supra* note 7, at 62 (discussing learning as one of the most frequently reported benefits of regulatory negotiation).

266. Steven Kelman, *Adversary and Cooperationist Institutions for Conflict Resolution in Public Policymaking*, 11 J. POL'Y ANALYSIS & MGMT. 178, 193 (1992).

267. *Id.* at 194.

268. *Id.*

by establishing a compelling need for problem solving,²⁶⁹ as the ESA listing process and the CWA requirements for water quality standards did in the CalFed process. Approaches that facilitate social learning increase the chances that agencies and stakeholders will devise innovative solutions that none of them individually would have conceived, let alone implemented. Although we recognize that this kind of exchange, interaction, and information production could conceivably occur in a traditional regulatory process such as notice and comment rulemaking, we think it fair to say that what we describe here would be the exception rather than the rule in the traditional context. Modular approaches, by contrast, are self-consciously designed to foster the kind of information-rich, highly interactive joint exercise we have in mind.²⁷⁰

Empirical evidence suggests that such interactions can have positive effects. They can promote a disposition to cooperate, lead to new ways of thinking, contribute to the development of new group norms,²⁷¹ improve once-adversarial relationships, and help to build trust.²⁷² These positive benefits are likely to accrue, we propose, in situations where parties are encouraged to share the data on which their judgments are based and defend those judgments directly to each other.²⁷³ Again, we hasten to add a caveat: participants in longstanding environmental and natural resource conflicts will not lightly abandon their traditional interests. The point is simply that well-designed and effectively managed processes can encourage social learning through joint ownership of a problem, information sharing,

269. Cf. Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 YALE L.J. 950, 950 (1979) (“We see the primary function of contemporary divorce law not as imposing order from above, but rather as providing a framework within which divorcing couples can themselves determine postdissolution rights and responsibilities.”).

270. See Kelman, *supra* note 266, 186–87 (explaining the phenomenon of social learning).

271. See *id.* at 185–86 (identifying how institutions that foster cooperation “encourag[e] participants to value and respect others”).

272. See Connick & Innes, *supra* note 170, at 180 (referring to collaborative policymaking and arguing that agreements can be important as markers but that “[w]hat are less ephemeral are the relationships, practices, norms and behaviours that emerge and persist”).

273. See LAWRENCE SUSSKIND & JEFFREY CRUIKSHANK, *BREAKING THE IMPASSE: CONSENSUAL APPROACHES TO RESOLVING PUBLIC DISPUTES* 13 (1987) (arguing that consensual decision making produces public policy that will “avoid stalemate, reduce the need for litigation, and restore the credibility of government”); Lawrence Susskind & Merrick Hoben, *Making Regional Policy Dialogues Work: A Credo for Metro-Scale Consensus Building*, 22 TEMP. ENVTL. L. & TECH. J. 123, 127–30 (2004) (explaining how a modular approach is optimal in addressing a hypothetical intermunicipal conflict).

and focused articulation of rationales. In so doing, they can increase the prospects for generating useful information. Whether that information is in fact incorporated into decision making requires another step, of course, but that it be generated in the first instance is necessary.

The EWA illustrates how process design can be so closely linked to substantive policy development that the line between the two seems to blur. First, recall that the EWA only surfaced once federal and state officials, and other stakeholders with relevant expertise, began to focus together on how to meet all of the Delta's competing needs at a time of crisis. Although some of the building blocks of the EWA were already in place before CalFed—agency coordination on the Accord standards and the beginnings of shared expertise—water operators could not run the pumps in a “real time way” because they were bound to meet the prescriptive standards set under the ESA. This, and the preoccupation of the stakeholders with competition over the resource, made it difficult for an alternative like the EWA to take shape as a policy. It only surfaced, and then developed into an option that could be implemented, when key players were asked under pressure to find new ways to cooperate.

The EWA was developed through a yearlong process—begun even earlier by the Ops Group—that required intense cooperation between the water agencies and the fisheries agencies, but it depended to a significant extent on other stakeholders like the powerful Metropolitan Water District and knowledgeable representatives from the environmental community. Together, the participants created technical teams to build and run water supply models of water delivery for multiple purposes. These modeling games depended on “real data on hydrology, project operations, and fish populations from past years, to experiment with different ways of managing the system” and represented “a turning point.”²⁷⁴ Quoting from an interview published in *Estuary* magazine, Hudzik recounts how one CalFed staff member described the process:

It's like playing three-dimensional chess all day long. When we get out of the gaming room, we're all brain dead. But the work that follows the game is even more important. For every eight hours of gaming it takes another 12 hours to figure out if we did any good.

274. Hudzik, *supra* note 142, at 47. Hudzik's article provides a comprehensive analysis of the EWA. *Id.* at 45–51.

Did we do better than a standard? Did we make more water? Did we use it more efficiently? How many fish did we lose?²⁷⁵

According to Wright, this was an innovation that could only have been accomplished by challenging the monopoly on expertise claimed by agencies like USBR and DWR, agencies that had historically been reluctant to try to satisfy multiple demands and which, as a result, lacked credibility in the environmental community. Yet water districts with no such prior commitments or political baggage emerged to offer stakeholders independent expertise on modeling.²⁷⁶ Similarly, on the environmental side, fish and wildlife agencies were no longer the sole experts—the environmental and university communities had become equally sophisticated. This “democratization of expertise” proved indispensable to devising the EWA.²⁷⁷

The modeling games gave the engineers and scientists who conducted them “an understanding of the water system as a whole that went well beyond the understanding each of them had brought to the process as individuals.”²⁷⁸

Perhaps most striking, the EWA requires a close working alliance among agencies that have been adversaries throughout the Bay-Delta conflict. The two groups of agencies have very different cultures and represent very different constituencies—constituencies that generally prefer to sue each other rather than cooperate. Running the EWA now requires that water project managers from DWR and USBR (typically trained as engineers) and wildlife officials from FWS and DFG (typically trained as biologists) work together to operate the two water storage and conveyance facility networks in the state. This alliance could produce a great deal of productive learning.

Engineers will learn more about listed fish species’ sensitivities. Biologists will learn more about minimizing water project yield costs. All will need to learn how to develop the EWA through project reoperation [increased yield from operational adjustments during periods when fish do not need water], taking advantage of periods when the projects have minimal effect on fish and project yield can grow. This deepening relationship between the ESA

275. *Id.* at 47–48 (internal quotation marks omitted).

276. Wright Interview, *supra* note 128, at 2.

277. See generally WONDOLLECK & YAFFEE, *supra* note 6 (providing case studies of collaborative efforts).

278. Hudzik, *supra* note 142, at 48.

Agencies and the Project Agencies offers one of the most important, yet unstated, benefits from the EWA's development.²⁷⁹

The EWA illustrates the extent to which policy innovation can be deeply dependent on process design. Modular structures are based on this understanding. In addition, the example demonstrates that something unexpected and productive can arise from a conflict-ridden situation when incentives are realigned to promote social learning. Remarkably, this can happen even when many of the background legal constraints continue to exert a countervailing force on the modular structure.

The learning process in modular initiatives may not look familiar, and it may not work in an entirely linear or predictable way. An example from the climate change context helps illustrate the way in which a seemingly inchoate process can nevertheless be productive: "Scientists may start with something they learned about the smoke from volcanoes, put it alongside telescopic observations of Venus, notice the chemistry of smog in Los Angeles, and plug it all into a computer calculation about clouds."²⁸⁰ This process "doesn't look like an exploring team moving into new territory. It looks more like a crowd of people scurrying about, some huddling together to exchange notes, others straining to hear a distant voice or shouting criticism across the hubbub."²⁸¹ Our concept of modular regulation contemplates somewhat more structure but shares this sense of improvised interconnectivities.

5. *Adaptation.* Modular structures are designed to be adaptive, meaning they must be flexible enough to absorb new information as it develops.²⁸² Because knowledge of environmental problems is so dramatically incomplete, and because environmental systems are so dynamic, regulatory and management institutions cannot be static.²⁸³ The challenge is to ensure that the modular structure is responsive and nimble enough to engage in dynamic learning, while being stable enough to function effectively. We can break this into three subproblems: (1) maintaining the necessary collection of information

279. Brandt, *supra* note 161, at 448.

280. SPENCER WEART, *THE DISCOVERY OF GLOBAL WARMING* 193–94 (2003).

281. *Id.* at 194.

282. For a definition of adaptive management, see Karkkainen, *supra* note 6, at 202–04.

283. FARBER, *supra* note 6, at 179.

by components of the modular system, (2) obtaining the needed flow of information among components of the modular system, and (3) keeping the organization flexible enough to respond to changing information.

Consider the challenge posed by CalFed. Even with over twenty expert government agencies and a wide variety of experienced stakeholders participating in the process, the dearth of knowledge about virtually every aspect of the Bay-Delta system is striking. What, for example, is really responsible for the failing fish populations in the Delta? The CalFed process cries out for scientific and technical information. This, we believe, is a key aspect of modularity: modular systems create institutions and structures aimed at generating and using timely, high quality information while avoiding “battles of the experts” that seek a single right answer. As Sam Luoma, CalFed’s first Lead Scientist, saw it, the advocacy approach to science that informed the pre-CalFed dispute was not very good at helping decision makers address the gray areas “where the science is uncertain and the decision-makers’ need for objective information is the greatest.”²⁸⁴

The Science Program helps to facilitate information collection and processing, which has been a recurrent problem in environmental regulation and natural resource management. This is enormously expensive and time consuming, and it often lacks a constituency. Indeed, interest groups sometimes would prefer to avoid the collection of new information that might contradict their own positions. By providing timely, useful, and highly credible information, modular structures can help to foster a constituency of “information consumers” in the form of other agencies and stakeholders. This new constituency can then maintain a demand for continued information collection. Again, the BDA’s role in promoting the use of science across the agencies in every aspect of the CalFed implementation process is instructive.

Even when the relevant information has been collected, however, it may not reach the people who really need it, either because of organizational reluctance to receive or share it, or both. Even when information flows freely, the system may be too inflexible to adapt to it, as when a change in direction would require not just a new agreement but a new rulemaking process. Ideally, modular

284. Nawi & Brandt, *supra* note 39, at 26.

processes provide mechanisms by which information can be directly fed into the system, as the EWA example illustrates with its approach to allocating water assets on an as-needed basis. This attitude toward information generation and consumption departs significantly from the approach that now dominates environmental law and natural resource management, an approach exemplified by statutes like the National Environmental Policy Act (NEPA), which requires agencies to disclose impacts or collect data without necessarily requiring that agencies put the data to productive use.²⁸⁵

Processes like CalFed can also spawn what we call “submodularity,” a variety of smaller scale teams or components that might address pieces of particular problems. These might take the form of subcommittees of stakeholders and agencies, as occurs in CalFed. Submodular structures like the BDPAC committees helped to generate the DIP, the alternative strategy for fish screens and the novel approach to water quality standards. Still more submodular processes might emerge in CalFed over time. For example, if a particular watershed within the larger Bay-Delta ecosystem is identified as needing a restoration plan, a team can be assembled specifically for that purpose, using staff from a variety of state, federal, and local agencies, as well representatives from stakeholder groups with relevant expertise. Indeed, submodular structures already seem to be proliferating in CalFed. For example, regional and local entities are increasingly exercising primary responsibility for implementing the key actions in the ROD (e.g., in developing watershed plans or integrated water management plans), which frees the CalFed agencies to remain focused on systemwide improvements.²⁸⁶ The agencies can also increase local knowledge of, and support for, programmatic goals by providing financial and technical assistance to submodular units. Indeed, Wright reports that where CalFed is seen as a source of funding and technical assistance for these efforts, local support for CalFed is stronger.²⁸⁷

Notice that these submodular structures do not permanently rearrange existing bureaucracies. Instead, they are provisional units

285. See Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 COLUM. L. REV. 903, 905 (noting that critics “bemoan the length and cost of the NEPA process [and] the spottiness and low overall quality of the information it generates”).

286. Wright Notes, *supra* note 119, at 10.

287. *Id.*

focused on a specific task. If they involve local participation, they may be especially adept at responding to the needs and perspectives at the county, district, or municipal level. And they may have the benefit of transmitting that more local experience to higher-ups who may be less familiar with how watersheds function locally. Ideally, submodular structures provide the vehicle for information to flow in an organized way throughout the larger modular system.²⁸⁸

Submodularity may also enhance flexibility. Being able to assemble problem-solving teams from particular agencies and stakeholder groups offers a way to meet new challenges without creating a rigid bureaucratic structure. The ability of modular and submodular components to combine in different ways provides a way of matching the right team with each problem. Modularity also helps address another barrier to agency flexibility, which is simply the inevitable fact that some agency officials are likely to be resistant to change. Those officials may be valuable, and their lack of flexibility may even be beneficial in tasks requiring central coordination.²⁸⁹ In any event, agency employees will necessarily vary in their problem-solving orientation and ability to adapt to new circumstances. Submodularity allows the most flexible individuals to be matched with problem-solving tasks requiring flexibility, leaving their more rigid colleagues to handle important but more routine tasks.²⁹⁰ These personnel issues may seem petty compared with the grand issues of regulatory or management reform, but in the end, the ability to effectively use personnel is key to the success of any system and especially critical when organizations are expected to adapt to changing circumstances.

As we have suggested, modularity is meant to convey this kind of institutional provisionalism. Without wishing to eliminate traditional bureaucracies, we propose that their component parts can be reconfigured into relatively larger and smaller structures for particular purposes. This requires thinking about agencies in terms of what they have to offer rather than how they usually act. Agencies represent a collection of different expertise, perspectives, and tools.

288. The “No-Name” group played something akin to this role in supplying information to the Ops Group and disseminating it back to stakeholders. Connick & Innes, *supra* note 170, at 189–90.

289. MALCOLM K. SPARROW, *THE REGULATORY CRAFT: CONTROLLING RISKS, SOLVING PROBLEMS, AND MANAGING COMPLIANCE* 234 (2000).

290. *Id.* at 233–34.

To reconfigure agencies effectively, of course, requires adopting a problem solving orientation, in which the “trick is to define the problem in the most natural and insightful terms, resisting the temptation to force problems into the mold of existing programs or bureaucratic structures.”²⁹¹

Far from addressing every aspect of a complex problem at the same time, then, a modular approach requires careful delineation of the matters that are most closely related and capable of being addressed simultaneously or through coordinated action, both in the short and longer term. Although this can sound abstract, it is in fact rather intuitive and sensible. Think of a building contractor planning and coordinating the many steps of construction in the context of imperfect information: demolition, drywall, wiring, plumbing, and the like. Some things must come before others; some must happen simultaneously; a few are so interdependent that they must be coordinated every step of the way. Some aspects of construction must be done immediately, though others can be deferred into the future. Unlikely things happen. And of course someone must keep paying the bills. A successful modular system will match components and subcomponents (teams and groups) with a defined set of tasks that represent only part of the larger problem. In doing so, the construction of the problems themselves will likely change. This is the hallmark of an adaptive system: new information and experience should help decision makers reconceptualize the challenges they face. CalFed illustrates that this kind of adaptation can take place when, as Nichols put it, you put the right people together in a room.

A related concern is the ability of modular structures to remain flexible and responsive as new facts and circumstances arise, while providing enough transparency to ensure that discretion is exercised in an accountable manner. This is, of course, an exceedingly delicate balance to strike. Traditionally in environmental law, as in administrative law generally, we add procedures to constrain discretion out of concern that too much flexibility will allow administrators to operate irrationally or to act out of purely political motives. Yet a modular approach requires at least some flexibility—the process would grind to a halt if every agency decision were

291. *Id.* at 147. For example: “Ecosystem management structures (watershed-based committees) can tackle ecosystem-shaped problems, but they are the wrong apparatus for solving industry problems that straddle multiple watershed areas or for addressing household threats.” *Id.*

obligated to go through a cumbersome and relatively formal process. Modular structures are characterized by at least as much informality as the traditional administrative process (which has considerable informality built into it despite the strictures of the Administrative Procedure Act), and likely significantly more. Witness the proliferation of informal instruments in CalFed, including the MOAs, “packages” that require written commitments, and annual workplans mentioned earlier. Certainly, these kinds of instruments might permit a broader range of discretion than would rules and orders. And they are easier to modify than regulations or enabling legislation.

Indeed, CalFed is a good example of how regulatory tools can become more flexible over time, allowing decision makers more discretion. Again, the EWA provides an example:

Before the Accord, . . . virtually all flow standards were expressed as mean monthly instream flows. Compliance is easy to measure, but otherwise this approach is not very effective in protecting fish that may migrate at different times in different years. We now have a more flexible set of tools, including the EWA . . . , and we even allow some standards to be relaxed to bank the water later for fish. . . . Under the old approach, the agencies simply monitored compliance with the standards and updated them (usually as a result of litigation) every decade or so through the adversarial process established by the State Water Resources Control Board. The agencies can now do experiments with these blocks of water and change how they allocate supplies on a daily, monthly, or annual basis, *without going through any kind of formal regulatory process*, and in doing so, immediately take advantage of the scientific work underway.²⁹²

Of course, operational flexibility and informal regulatory tools, as administrative and environmental law scholars well know, both pose significant downside risks. The environmental community involved in the CalFed process may worry that the much touted “flexibility” of the collaborative process will really amount to a consistent preference for, say, farmers over fish, when it comes to allocating water. They might suspect that the regulatory baselines

292. Wright E-mail, *supra* note 139, at 6–7 (emphasis in original). Wright explains that “in the first year of the EWA, the agencies allocated some of their EWA supplies to protect migrating winter-run salmon.” *Id.* at 7. Then in later years, the scientific data showed little evidence that pumping is a major concern for the winter-run, so the agencies allocated their supplies to the Delta smelt instead. *Id.* Wright cites this as a good example of real-time management made possible by the flexibility of the regulatory tools. *Id.*

over which they have litigated so fervently will be undermined or deferred until later in a highly discretionary and relatively invisible process that is not as easy to monitor as lawsuits.²⁹³

Such concerns are perfectly legitimate and they sound an important note of caution. Ultimately, modular enterprises will depend heavily on the capacity of the institutional framework to deliver on its commitments or to offer credible explanations of why progress may be slower than expected. This is the only way to build trust. Still, in a multistakeholder environment where resources are scarce and valuable, parties will always have reason to complain. Even when they benefit, it will be simply against their long-term interest in gaining even more to claim they have received enough. The key, as Wright points out, is to hold the moderate center together. Of course, it matters who the decision makers are in such systems. If decision making becomes highly politicized, with wild swings in orientation as administrations change, stakeholders will conclude that the “balance” promised them will never materialize. The institutional framework must provide some assurance of stability for stakeholders to buy into it. This is why insulating decision makers from political winds, to at least some extent, is crucial. The BDA’s unique structure as an independent agency with a stakeholder advisory group offers one example of an effort to avoid total dominance by either the executive or the legislative branch, or by any single agency.

6. *Public Participation/Accountability.* Modular structures require multiple avenues, formal and informal, for broad stakeholder participation. Ideally, this not only improves the quality of decision making but also to help provide accountability. The key difference between participation in a modular process and the public participation provided by traditional administrative process lies in the diversity of roles that stakeholders can play; in a modular process they both generate policy ideas and perform an accountability function.

As we have already noted, stakeholder participation in the CalFed process has been both highly varied and highly valuable. Like

293. For example, the commitments offered in the DIP, which promises greater flexibility in Delta export pumping to make it easier to meet the program’s multiple objectives, could conceivably result in excess pumping to the detriment of the fish. *Id.* The DIP commitments have no legal force behind them. *Id.*

most features of CalFed, the format of stakeholder participation has evolved over time, but it has always proceeded simultaneously along multiple tracks. The BDPAC is the most formalized avenue for stakeholder input both to the Authority and the implementing agencies, but there are numerous other channels. In some instances, as with the EWA, stakeholders participate fairly directly in the sort of operational decision making that is normally thought to be the exclusive domain of agencies. Modular structures are characterized by this kind of deep and broad stakeholder participation.

Indeed, sometimes stakeholder participation leads to real policy shifts and new ideas, as we have seen not only with the development and operation of the EWA but with the DIP and the ELPH strategy as well. These examples demonstrate that stakeholder expertise can be enormously valuable, as can their relative independence. Federal and state agencies have no monopoly on the scientific and technological knowledge required to address complex environmental problems. This is not because average citizens living in local watersheds necessarily have engineering degrees. The expertise in which we are most interested likely resides in sophisticated local institutions or interest groups with training, experience, and track records. Perhaps surprisingly, it is not just that agencies can help to mediate disputes among historically warring stakeholders but that stakeholder involvement can help to overcome impasses between historically opposed agencies.

Nevertheless, the inspirational stories of breakthroughs due to stakeholder initiative are frequently enough balanced by more depressing accounts of breakdowns, or of less than noble participation—as when stakeholders remain active solely to protect their interests, threatening all the while to do an end-run around the process via litigation—to give us pause.²⁹⁴ And the problems are not always caused by stakeholders. There can be instances in which decision makers consult stakeholder groups in a *pro forma* way simply to maintain the appearance of public consultation. Such behavior can be expected to occur in collaborative processes that depend on negotiation and compromise. The hope is that they can be minimized.

Despite these shortcomings, the CalFed process represents an improvement over the two most traditional mechanisms of public

294. Wright Interview, *supra* note 128, at 4–5.

involvement in agency decision making: the notice and comment process for rulemaking and the EIS planning process under NEPA and CEQA. These mechanisms provide only relatively infrequent and superficial opportunities for consultation. In these processes the agency (usually a single one) retains “ownership” over decision making, and has relatively few, and often highly structured, opportunities to hear from knowledgeable players. Moreover, stakeholder participation will be most intense at peak-level moments, as when a rule is proposed or an EIS is issued, rather than throughout the life of planning and implementation. Stakeholders may find it especially valuable to have an opportunity to influence decisions made by agencies that are traditionally opposed to their interests. The interagency processes and stakeholder fora in the CalFed process afford opportunities for environmentalists to make some headway with USBR, and for water contractors to have some impact on FWS.

B. Modular Analogs

We have tried to give the concept of modularity sufficient content in the environmental context to enable someone to discern whether a particular initiative can credibly claim to be modular. To further illustrate what we have in mind, we draw in this section on modular analogs that arise in fields far-removed from environmental regulation.

In the computer industry, for example, modularity “means organizing complements (products that work with one another) to interoperate through public, nondiscriminatory, and well-understood interfaces.”²⁹⁵ This might involve “[a]n open architecture [which] can facilitate innovation in individual components” and allow “rapid trial-and-error learning.”²⁹⁶ Flexibility and the capacity to facilitate learning are key features of a modular structure in this context.

Despite the obvious differences between the two settings, designing software and designing organizations to tackle environmental problems share some challenges. For example, both settings call for systems capable of processing large amounts of information and performing complex tasks. Both settings also raise

295. Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J.L. & TECH. 85, 95 (2004).

296. *Id.* at 95; *see also id.* at 92 (noting that a modular structure “facilitated innovation in ways that had not been matched with an integrated structure”).

issues of transparency (needed by the software engineers for error correction and later modification of software; needed by environmental regulators for both error correction and public accountability), and both must pay careful attention to linkages between components to ensure they function without discord. Even more concretely than in the environmental context, modularity in software design refers to the extent to which an entity “can be broken down into smaller components, or modules, that can be independently and asynchronously produced before they are assembled into a whole.”²⁹⁷ This captures the notion of building, unbuilding, and rebuilding that we referred to earlier.²⁹⁸ Modularity makes possible, among other things, the design of public source software by multiple individuals, allowing scattered individuals to rival the product of the world’s largest corporation.²⁹⁹

One of modularity’s key features is the coordination of existing agencies for particular purposes, without necessarily creating cumbersome new bureaucracies. Recall that the role of the BDA is to facilitate and encourage this coordination. A modular system thus facilitates the pooling of expertise from many different entities.³⁰⁰ Transaction cost economics supplies a useful analog for this aspect of modularity. Consider, for example, the so-called “make/buy” decision that business enterprises confront when choosing whether to outsource work to a network of suppliers rather than acquiring those suppliers and integrating all operations within a single organization.³⁰¹ According to transaction cost economists, there are limits to how much activity a single organization can effectively control. For that

297. Yochai Benkler, *Coase’s Penguin, or, Linux and The Nature of the Firm*, 112 YALE L.J. 369, 435 (2002).

298. In software design, for example, “[T]ransparent modularity permits code to be modified; it permits one part to be substituted for another. The code then is open; the code is modular; chunks could be moved and substituted for something else; many forks, or ways that the code could develop, are possible.” Lawrence Lessig, *Open Code and Open Societies: Value of Internet Governance*, 74 CHI.-KENT L. REV. 1405, 1415 (1999).

299. See Benkler, *supra* note 297, at 434–36 (describing how modularity plays a key role in the efficiency of large-scale collaborations); Lessig, *supra* note 298, at 1410 (noting that some believe Linux to be “the single greatest threat” to Microsoft).

300. See Sabel et al., *supra* note 6, at 14–15 (identifying pooling as a means of consolidating data to develop more effective regulatory practices).

301. For an overview of the elements that factor into such decisions, see Benkler, *supra* note 297, at 400–23.

reason, it is more efficient to cooperate with other firms rather than to perform everything in-house.³⁰²

Eventually, diseconomies of scope and scale catch up with any organization. This is as true in the regulatory sphere as in business. Thus, it is possible to discern the outlines of a transaction cost approach to modularity. Overcoming diseconomies of scale and scope can be an important function of regulatory modularity. Where agencies have different areas of specialization, configuring them for particular purposes can take advantage of the economy of scale resulting from their respective strengths. It might be quite difficult and costly, by contrast, for a new bureaucratic entity to develop the relevant expertise on its own. And, of course, there is the political impracticability of eliminating agencies that have become entrenched. A modular approach offers an avenue for reform that is less wrenching and more pragmatic.

Yet another example of modularity can be found in the international context, in which states come together to create differently configured “regimes” (essentially, formal or informal rule systems) for solving particular problems.³⁰³ Nation states naturally have different values and interests, and relatively more or less power, yet they frequently coordinate their activities. They do this in myriad ways: by signing treaties, building international institutions, entering

302. See OLIVER E. WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS* 117 (1975) (“The distinctive powers of internal organization are impaired and transactional diseconomies are incurred as firm size and the degree of vertical integration are progressively extended.”).

303. For examples of such regimes, see the World Trade Organization, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and the World Intellectual Property Organization. International law scholars are just beginning to identify and analyze the relationships between these different sets of rules. See Laurence R. Helfer, *Regime Shifting: The TRIPs Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 *YALE J. INT’L L.* 1, 6–7 (2004) (analyzing the reasons for and relevance of international regimes in the context of international intellectual property law); Kal Raustiala & David G. Victor, *The Regime Complex for Plant Genetic Resources*, *INT’L ORG.* 277, 279–81 (2004) (defining a regime in the singular as a core international agreement administered by a discrete organization and extending the analysis to “regime complexes,” in which interrelated and overlapping regimes require broad rules to allow navigation of conflicting legal rules, thereby enabling argumentation over interpretation and forum shopping among regime institutions). See generally Andrew T. Guzman, *International Antitrust and the WTO: The Lesson from Intellectual Property*, 43 *VA. J. INT’L L.* 933 (2003) (proposing a process of developing an international antitrust regime based on lessons learned from the development of international intellectual property regimes because of the shared characteristics of the two fields).

On the conflict between different regimes, see generally *Theme Statement: Conflict and Coordination Across International Regimes*, 97 *AM. SOC’Y INT’L L. PROC.* 325 (2003).

informal agreements, and engaging in episodic ad hoc cooperation. In addition to agreements among states, moreover, international cooperation and coordination can arise less formally, through networks of regulators or other substate actors such as nongovernmental organizations.³⁰⁴

The implicit suggestion of this perspective on international relations is that states and their subparts build and then participate in a wide variety of arrangements for different purposes. One can imagine regimes, therefore, as an example of the kind of institutional provisionalism that we think of as modular. These processes allow states and networks of actors across states to maintain officially their separate identities and voices, while acting in concert in a wide variety of ways to advance their interests. It is intriguing to see the supposedly hierarchical world of domestic regulation evolving in a direction reminiscent of modern international relations. The components of the modular structure in each setting provide access points—voice opportunities—for a wide variety of groups and perspectives. As in the international arena, there is tremendous heterogeneity among interest groups in the domestic sphere. A more hierarchical organizational form would provide fewer opportunities for this kind of cross-cutting input.

While incomplete, these examples are suggestive, we hope, as analogs and metaphors. They highlight some additional benefits of modularity that supplement our own case study: the idea that modular structures may increase structural transparency and flexibility, help to overcome diseconomies of scope and scale, and be better able than hierarchical structures to accommodate diverse voices. Of course, we recognize that this vision remains a normative ideal. Real world modular structures may go some of this distance, but they still face serious obstacles. We turn to these in the next section.

304. Anne-Marie Slaughter, *The Real New World Order*, FOREIGN AFF., Sept.–Oct. 1997, at 183–97; see also MARGARET E. KECK & KATHRYN SIKKINK, *ACTIVISTS BEYOND BORDERS: ADVOCACY NETWORKS IN INTERNATIONAL POLITICS 1* (1998) (describing the emergence of “transnational advocacy networks” consisting of state and nonstate actors).

IV. OBSTACLES TO MODULARITY

A. *Resistant Agencies*

One of the greatest obstacles to modularity, as noted, is the traditionally narrow mandates, missions, and organizational structures of regulatory and management agencies.³⁰⁵ Many agencies resist coordinating their activities with other agencies, even when they might agree that coordination would be beneficial because they face few incentives to do so. This is the product not only of statutory mandates, but also of oversight by the three branches. Congress tends not only to authorize but to fund agencies on an individual basis. For their part, courts have little opportunity to encourage interagency coordination; their main function is to ensure that individual agencies do not abuse the discretion afforded them by Congress. And although, of all the branches, the executive branch may have the biggest interest in interagency coordination,³⁰⁶ it nevertheless remains elusive.³⁰⁷ Agencies tend to reflexively resist sharing their authority or

305. This point, and many others like those we make in the rest of this section, were made (it has been pointed out to us) in an impressive CEQ Report commissioned by the Clinton administration but never acted upon. COUNCIL ON ENVIRONMENTAL QUALITY, THE NATIONAL ENVIRONMENTAL POLICY ACT: A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS 7 (1997), available at <http://clinton4.nara.gov/media/pdf/nepa25fn.pdf>. Ten years ago, the Clinton administration was already thinking along the lines of interagency teams, stakeholder partnerships, and cross-cutting budgets—the building blocks for the kind of modularity we advocate here. The EPA also published a path-breaking work during the same period through its watershed planning and ecosystem restoration programs, which have led to increased agency coordination on a watershed basis. See Karkkainen, *supra* note 6, at 191–92 (citing EPA efforts to replicate nationally programs like the Chesapeake Bay Program, which use a “watershed approach”).

306. See Terry M. Moe & Scott A. Wilson, Presidents and the Politics of Structure, 57 *Law & Contemp. Probs.* 1, 11–12 (1994) (arguing that only the President, and not Congress, has the incentive to coordinate across agencies); see also *id.* at 18–19 (discussing how presidents can centralize control over policy decision by imposing managerial rules, using the Office of Management and Budget, and establishing structures).

307. For example, since the terrorist attacks of September 11, 2001, both the President and Congress have instituted a variety of reforms aimed at increasing interagency coordination over national security, including the creation of an entirely new agency: the Department of Homeland Security. See Homeland Security Act of 2002, Pub. L. No. 107-296, §§ 101–103, 116 Stat. 2135, 2142–45 (codified at 6 U.S.C.A. §§ 111–113 (Supp. 2004)). However, interagency coordination is still weak. See U.S. GOV'T ACCOUNTABILITY OFF., GAO-05-323, U.S. PUBLIC DIPLOMACY: INTERAGENCY COORDINATION EFFORTS HAMPERED BY THE LACK OF A NATIONAL COMMUNICATION STRATEGY 2–5 (2005) (describing the need for greater interagency coordination for national security), at <http://www.gao.gov/new.items/d05323.pdf> (on file with the *Duke Law Journal*).

constraining their flexibility in any way that might compromise their independence and power. Agencies may also erect obstacles to too much public involvement—many agency staff likely think the traditional public comment period works just fine and have no wish to cede decision making power to outsiders. And finally, agencies are especially reluctant to yield any of their budgeting authority. They can be expected to push for funding for their narrow priorities rather than for what's best for the program as a whole, if it would diminish their share.³⁰⁸

Moreover, the extent to which agency culture can be a significant impediment to change cannot be overstated. One of the lessons of the CalFed process is that each agency brings different notions of their roles and different cultures to the table. Some agencies are motivated to improve the quality of their decision making to accomplish their statutory mandates, whereas others are more oriented to assisting their clients even when doing so conflicts with a larger notion of the “public interest.” Some agencies have track records of being more open and transparent in decision making, whereas others have legacies of being closed. And finally, agency staff tend to have relatively narrow job classifications and areas of expertise. Relatively few of them can be expected to have been exposed to dispute resolution and collaborative processes.

It is difficult to convey how challenging interagency coordination can be, even with committed, strong leadership and a set of key players willing to risk political capital with their constituencies.³⁰⁹ Agency cooperation requires resources in the form of personnel and money. Insufficient resources is said to be the most common cause of failure in cooperative efforts.³¹⁰ Yet securing sufficient funding is easier said than done. As we saw with CalFed, modular approaches to regulation and management will require a substantial commitment of resources, sometimes in the billions of dollars, which is especially difficult to raise in times of budget shortfall.

308. See Nawi & Brandt, *supra* note 39, at 32 (“[A]gencies in general in any area of government are resistant to sharing their authorities and to any actions or structures that could constrain their independence or normal decision-making process.”).

309. As one scholar remarks: “Agencies cooperate? Of course not! As one of my colleagues quipped when I told her I was writing a book about interagency cooperation, ‘Short book, huh?’” EUGENE BARDACH, *GETTING AGENCIES TO WORK TOGETHER: THE PRACTICE AND THEORY OF MANAGERIAL CRAFTSMANSHIP* 4 (1998).

310. *Id.* at 163. “Nothing coordinates like cash,” says one scholar. See *id.* at 191.

Beyond being expensive, modular structures present unique problems because they require programmatic funding across issues and agencies. As we noted earlier, the legislative process is neither organized nor accustomed to funding on this cross-cutting basis.³¹¹ In a recent effort to secure federal authorization for CalFed, the program's advocates sought precisely this kind of funding in the form of a "block grant" intended to cut across agencies, with the idea that budgeting decisions among them would be guided by general principles like "balanced implementation."³¹² This would leave agency administrators (presumably advised by the BDA) with the freedom to steer funds to those aspects of the larger CalFed Program that needed it first or most. The effort to secure such funding failed, however. In the end, Congress authorized CalFed but required that the legislation describe all of the specific projects and programs in the CalFed ROD. As Wright says, key members of Congress needed to assure themselves that the program was balanced. They were not prepared to leave those judgments to agencies, guided by the BDA.³¹³ Although this is hardly surprising from a traditional oversight perspective, it reduces the flexibility to adjust the balance of funding as conditions change.³¹⁴

Thus, modular processes not only require substantial resources, they may well require a different approach to funding entirely. The federal budget process stymies efforts at cross-cut budgeting at every turn, not just in the appropriations process. For example, now that the federal authorization bill has passed, OMB has developed an

311. See Wright E-mail, *supra* note 139, at 6 (stating that attracting support for CalFed in Congress is difficult because members must be convinced to accept the plan as a whole, rather than picking and choosing elements they want to support). We suspect that fragmentation among oversight committees for different agencies could be another contributing factor.

312. Wright Notes, *supra* note 119, at 4.

313. *Id.*

314. Wright recalls the fateful meeting between Senators Feinstein (D-CA) and Kyl (R-AZ) on the CalFed bill this way: "At one point Kyl turned to me and said, 'Sorry, I understand that you have an innovative program out there, and that balance is important but I'm a traditional guy, and I need to see things done the traditional way.'" Wright Interview, *supra* note 128, at 1. Convincing members of Congress to fund on a more programmatic basis is especially challenging when members had no significant role in shaping CalFed from the start. And the fact that CalFed depends on a multiple agency strategy for implementation also complicates the process of seeking support in Congress. Instead of focusing lobbying efforts on one agency (e.g., the Department of Interior, which funded CalFed in the initial stages) the Program must continue to seek funding from many different agencies, which means many different congressional committees will need to be persuaded of its merits. Wright Notes, *supra* note 119, at 4.

interagency cross-cut budget that shows all expenditures related to CalFed.³¹⁵ This helps to convey to legislators what CalFed as a whole requires, and it could help to coordinate what the agencies need relative to one another on an ongoing basis. Still, OMB produces the interagency budget *after* agencies submit their requests. There is no interagency process on the front end, at the planning stage when it is needed most. As Wright says, “There is still no adequate mechanism for a truly interagency approach. The agencies involved not only don’t share their budget requests that go to OMB, they are prohibited from sharing them—and they have separate OMB examiners—because all budgeting is done on an agency by agency basis.”³¹⁶

Beyond funding modular efforts, Congress and state legislatures can help to stimulate modularity by creating legislative triggers or default rules that force stakeholders to cooperate. We saw this in the CalFed process. Strict legal mandates, like ESA-driven limits on pumping, or water quality standards under the CWA, can trigger a sense of crisis that prompts agencies to overcome traditional ways of doing business. Little concentrates the efforts of an agency as much as the prospect of an ESA injunction or the anticipation of pump shutdowns in the Delta during growing season. Litigation may function as a useful background threat, as long as it is not used so indiscriminately as to derail the process entirely. One study suggests that the perceived threat of litigation is one of the two most important factors determining levels of interagency cooperation.³¹⁷

The other important factor in promoting cooperation is the influence of professionals across agencies who share both a common perspective and a professional network.³¹⁸ To the extent that

315. See OFF. OF MGMT. & BUDGET, CALFED FY 1998–2006 BUDGET CROSSCUT METHODOLOGY (2005), available at http://www.whitehouse.gov/omb/budget/fy2006/pdf/ap_cd_rom/calfed_methods.pdf; OFF. OF MGMT. & BUDGET, CALFED-RELATED FED. FUNDING (2005) (showing federal funding by CalFed category and by agency), available at http://www.whitehouse.gov/omb/budget/fy2006/pdf/ap_cd_rom/calfed.pdf.

316. Wright E-mail, *supra* note 139, at 6; see also COUNCIL ON ENVIRONMENTAL QUALITY, *supra* note 305, at 7 (citing interagency coordination as key to successful collaboration).

317. THOMAS, *supra* note 31, at 258–59. Managers particularly feared the loss of autonomy that an injunction would cause. *Id.* at 263.

318. *Id.* at 261. Professor Thomas argues that the influence of ecologists was due in large part to their united viewpoint:

Their influence resulted not from their absolute numbers or line authority within the agencies, but rather from their consensual knowledge. The management principles of conservation biology offered synergistic possibilities for joint gains that spread throughout the larger epistemic community of ecologists, and were gradually understood and accepted by line managers and field staff as well.

legislators, in structuring agencies, and agency staff themselves in coordinating with one another, can promote these connections, they can help to lay a foundation for modularity.³¹⁹ In addition, cooperation may work best with agencies whose line managers enjoy significant discretion and are not tied down by complicated standard operating procedures.³²⁰ Again, there is a lesson for legislatures: narrowly circumscribed statutory delegations may frustrate cooperative problem solving, even as they serve to constrain agency discretion.

B. Accountability

As with any governmental decision-making structure, we expect modular systems to be accountable. But this begs the question, Accountable to whom? And what is evidence of sufficient accountability? We resist characterizing the accountability challenge in this context as a simple version of a principal-agent problem.³²¹ That characterization can be appropriate in some instances, but it seems too formal and simplistic for the environmental and natural resource contexts with which we are concerned. For example, the traditional principal-agent formulation assumes the existence of a principal with well-defined preferences. Yet this fails utterly to capture the dynamic in a multiagency, multistakeholder, intergovernmental process like CalFed. In these situations, there are likely to be numerous principals across different levels of government with a variety of sometimes competing preferences. We expect that a modular system such as this will raise the same concerns about accountability that arise in any networklike arrangement of decision makers in which power is diffused.³²²

Id. As Thomas explains: “In California, agency ecologists had been cooperating for years—within professional networks, across agency boundaries—trying to develop plans and gather agency resources to implement these plans.” *Id.* at 265. According to Thomas’s study, the Park Service did not cooperate well because it was on good terms with environmental groups and was, therefore, not worried about being sued. *Id.* at 267.

319. Professor Thomas’s study also revealed that the rotation of personnel could present a serious barrier to cooperation, which depends on long-term working relationships. These are unlikely to develop in agencies where “success” often leads to transfer. *Id.* at 271–73.

320. *Id.* at 274–75.

321. This is not to say that application of the economic concept of agency slack is not useful; only that it provides only a partial understanding. For a thoughtful application of this framework in an analogous setting of private firms, see generally Michael J. Trebilcock & Edward M. Iacobucci, *Privatization and Accountability*, 116 HARV. L. REV. 1422 (2003).

322. Professor Richard Stewart has summarized some of the concerns as follows:

Yet modular arrangements can be surprisingly “accountability-rich.” Recall that in CalFed each agency remains intact. This means that as agencies take steps to implement the program, they must, at a minimum, adhere to the normal procedural rules that would apply to them, including federal or state APA requirements. And, as always, each of these agencies is accountable to multiple principals: they must obey their statutory mandates, respond to legislative oversight, adhere to judicial decisions, and conform to the priorities of their executive branch principals. Nothing in the CalFed process supplants these traditional checks. Rather, the process supplements them with additional accountability measures.

In a modular structure, the agencies must also respond to one another and to stakeholders they have brought into the process. In this sense, accountability in modular structures—at least those characterized by a significant amount of interagency coordination, intergovernmental cooperation, and stakeholder participation—is horizontal. This means that although decision makers are hierarchically located in relation to a variety of traditional principals, they are also horizontally placed in relation to both sister agencies and other important constituencies. The CalFed example illustrates how horizontal accountability might work. Recall that as part of agreeing to the DIP, agencies with historically competing interests agreed to link their actions: DWR and USBR’s plans for pumping water from the Delta for their clients would be linked to the fish and wildlife agencies’ planning process for protecting endangered fish. And similar linkages were established through the creation of the EWA, which requires traditionally warring agencies and stakeholders to make decisions together. In this situation, the implementing agencies must respond more often and to more players than they

The network is not a legally accountable entity. In some cases, the network process will eventually result in formal legal arrangements involving governmental authorities, memoranda of understanding, licenses for regulated entities, even formal regulations. These can be reviewed by courts for excess of power There may, however, be many participating governmental entities, from different levels of government, subject to review in different courts. . . . [I]t is hard to see how the interest representation model, which relies on formal legal procedures for decisionmaking, can be successfully applied to network arrangements. Successfully subjecting network decisionmaking to a system of regulatory analysis review on the OMB model is also quite problematic.

Richard B. Stewart, *Administrative Law in the Twenty-First Century*, 78 N.Y.U. L. REV. 437, 452 (2003). As to Stewart’s final point about OMB oversight, our view is that economic analysis (where appropriate) should be part of the initial decision-making process, not an add-on imposed by an external reviewer.

would in a traditional principal-agent relationship.³²³ And with so many parties constantly talking to one another, it is harder for any party to dominate the process, or to get away with something by going off secretly on its own. Although the accountability to principles in the traditional APA model can theoretically work to block bad rules or projects if they are sufficiently large and visible, the CalFed modular structure actually introduces additional mechanisms of control that may be more likely to constrain action in practice. And beyond providing a check on bad behavior, the interpenetration afforded by horizontal relationships can help to change longstanding cultures and attitudes.

In addition to horizontal and vertical accountability, modular systems can create additional layers of accountability in the form of new institutions. In CalFed, the group of implementing agencies must answer to the BDA. One might think the BDA is bound to be a weak institutional player because it possesses neither budgetary nor rulemaking power; indeed, it wasn't even legislatively authorized until 2003. Yet by all accounts the Authority has been quite effective at promoting coordination. We suspect this is at least in part because it is specifically charged with overseeing the entire program and has no single constituency. Without a historical client base, the Authority is the only entity that is entirely free to pursue balanced implementation in earnest. The BDA has also taken advantage of nontraditional oversight tools. For example, notwithstanding its lack of direct budgetary power, the Authority has worked with the Governor's Office of Finance to try to ensure that programwide state spending is balanced among objectives.³²⁴ And even without the power to directly alter the agencies' legislative mandates (as Congress or a state legislature might), the BDA can affect the agencies' implementation of their statutory mandates by engaging in a less direct form of oversight: making recommendations; rejecting proposals; and requiring explanations and plans on a regular basis.

Nevertheless, there remain reasons to be concerned about whether modular systems will, in practice, produce sufficient accountability. First, the plural accountability described above has a downside: there may be so many vertical and horizontal checks in place that observers will not know who is ultimately responsible for

323. Note that the Bay-Delta Authority influences programwide budgeting, however, through the Office of Finance. Wright Notes, *supra* note 119, at 7.

324. See *supra* note 183 and accompanying text.

what. In other words, if accountability is too diffuse, it may not be meaningful. In addition, the relative informality of modular tools (e.g., agreements, packages, plans) may come to displace more traditional, visible, and formal agency procedures. In the worst-case scenario, so-called modular approaches may serve—as some environmentalists fear about CalFed—as a front for unrestricted discretion by bureaucrats.

Selecting the participants in a modular structure also presents potential accountability problems. Modular structures depend on a delicate balance of agencies and stakeholders. But what determines which stakeholders should participate? In the CalFed example, the stakeholders with the most influence either have significant political power (meaning they have demonstrated the capacity to grind the system to a halt through litigation), significant expertise (meaning they are valuable in finding solutions), or both. But few stakeholders can credibly claim to represent fully the “public interest.” This concern arises with all collaborative or multistakeholder initiatives. In theory, virtually any group of stakeholders can be disqualified on the grounds that it will only pursue its narrow interests or because its claims to representing a broader public are dubious. This charge can be leveled equally at private firms, local watershed groups, and national environmental organizations, none of which is elected by the general public. Even participation by local governments can raise problems. To the extent that they achieve a dominant role, local interests (perhaps captured by industry) might outweigh state or national interests. Moreover, local government is often fragmented among multiple municipal governments, whose interests and incentives may or may not converge with those of the metropolitan region as a whole, let alone those of the broader public.³²⁵ Meanwhile, higher levels of government are often thought to be disconnected from the concerns of those most directly impacted by regulatory actions.

If designed poorly, then, intensive collaboration between different levels of government and among a variety of agencies and stakeholders might diminish political accountability. In *New York v. United States*,³²⁶ a case in which state participation in a federal environmental program was mandated by federal legislation, Justice

325. For an extensive discussion of this problem and possible solutions, see David Barron, *Reclaiming Home Rule*, 116 HARV. L. REV. 2255 (2003).

326. 505 U.S. 144 (1992).

O'Connor worried that democratic accountability would suffer because of the inability of citizens to identify whether it was state or federal officials who had ultimate policy responsibility.³²⁷ Modular structures are significantly more complex than this simple federal-state scenario, as we have shown, and it is easy to imagine that they could cause much greater citizen confusion. To put a fine point on it, if you have a problem concerning the drafting or implementation of the Bay-Delta ROD, against whom, precisely, should you vote in the next election?

No governance arrangement can provide perfect accountability, and measuring modularity against such an ideal would be unfair. But modular approaches must be designed with these concerns in mind. So, for example, although it is impossible to specify precisely which stakeholders ought to participate in each modular regime, it seems appropriate to establish an expectation of balance: balance in numbers, across perspectives, and in terms of capacity. And we would expect modular structures to aim to give voice to a variety of local, regional, and national interests, providing access for a rich and diverse set of stakeholders.³²⁸ As we have already noted, the various participants will provide a menu of political and legal accountability mechanisms. If the system is badly designed, these vertical and horizontal accountability mechanisms may in effect cancel one another out, but in a well-constructed system they should reinforce each other. The fact that some participants have direct electoral control fosters one form of accountability; the fact that others must be prepared to defend the reasonableness of their actions in court may provide another; the ready access of some participants to the media may provide yet a third. Participants may check and balance one another in true Madisonian style. Nongovernmental organizations, local governments, state governments, firms, communities, districts, and federal agencies have diverging interests. They may, granted, collude with one another, but they are at least equally likely to act as fire alarms, alerting legislators and the public to malfunctions of the regulatory process.

As we have seen, CalFed is highly, if imperfectly, transparent. It features both formal and informal tracks of stakeholder participation

327. *Id.* at 168–69.

328. Just as the national government includes representation of state populaces (the Senate), more localized communities (the House), and the nation as a whole (the president), so the modular structure can blend constituencies.

(including the Public Advisory Group and many informal opportunities for contact with both the Authority members and agency staff); a rigorous Science Program that independently reviews each aspect of program implementation; Annual Work Plans requiring detailed updating by agencies; the DIP, a package of commitments to renew balanced implementation of the key elements of the plan; and an Authority created to coordinate agency actions, which themselves remain subject to the APA and other applicable administrative law requirements. In the face of such overlapping and complementary features, it would be misleading to suggest that this process of checks and balances is “unaccountable.”

CONCLUSION

Modular environmental regulation seeks to overcome regulatory fracture through inter-agency and inter-stakeholder coordination. It requires that institutional form follow function, relies on “agreement based” decision making, facilitates “social learning,” and both encourages and depends upon an adaptive process in which information plays a crucial role. Finally, a modular approach promotes accountability by supplementing traditional procedural checks with a variety of informal controls and broad stakeholder participation. The goal of the modular enterprise is to diagnose problems and design solutions first, and then to devise governance institutions and regulatory or contractual tools capable of implementing them. This requires a willingness on the part of decision makers to free themselves, even if temporarily, from the narrowness of their own statutory mandates, procedural practices, and cultural blinders so that they can participate in systemwide problem-solving. Studies show that there are significant benefits to adopting a problem-based approach, and innovative agencies often do this informally.³²⁹ Yet they could do so much more frequently. Participants in modular processes must resist the temptation, however, to simply fit their definition of the problems to be solved

329. SPARROW, *supra* note 289, at 132–34. We recognize that the challenge of problem definition remains. To some extent, this process is intuitive. It makes no sense “[t]rying to force, through the ecosystem management system, problems that do not coincide with specific watershed areas (for example, the problem of pesticide-induced arsenic concentrations on golf courses, or threats to manatees from speeding boats, or radon in homes, or asbestos in schools).” *Id.* at 218.

into the mold of existing bureaucratic structures.³³⁰ The CalFed example at the heart of this article, while falling short of our theoretical ideal, nevertheless serves as the best example we have found of a modular approach to environmental regulation. As we learned through CalFed, the background legal regime exerts a powerful gravitational pull. It can retard the design of new institutions and inhibit the development of innovative policy options. The problem-solving focus we advocate is meant to encourage participants to look beyond these existing constraints—to finesse and channel them—even if it is impossible to overcome them entirely.

Modularity is not a panacea, but the alternatives are distinctly unpromising. One could imagine, for example, the formation of a collection of new, autonomous legal entities, correctly geared to the scale of a given environmental problem or geographic area and designed to replace existing agencies. Unlike a modular structure, which is subject to all the existing accountability mechanisms of its members, such new entities would need an entirely new accountability process. Apart from the potential confusion that could be caused by a multitude of such special purpose agencies, we believe that in many cases they would be faced with an unmanageable task for which they would have to develop their own expertise. The political, legal, and economic costs of replacing existing bureaucratic structures with such entities seem overwhelming. An alternative solution is to consolidate all authority at the highest existing applicable level of government, which would normally be the federal government. As with all proposals to centralize environmental regulation and resource management in the federal government, however, the chief problem is that federal decision makers are too remote from local conditions to make the day-to-day judgments necessary to effectively manage environmental resources.

It remains tempting, though ultimately impractical, to consider integrating the myriad functions of existing environmental agencies, whether at the federal or state level. As a thought experiment, imagine that everything relevant to environmental protection and natural resource management in the United States could be the subject of one unified program, coordinated by one agency. In this hypothetical universe, water quality issues would never be considered independently of water allocation issues, which would always require

330. *Id.* at 147.

consideration of species conservation and, more generally, ecosystem health. But addressing ecosystem health would require addressing agricultural practices and resource extraction methods, along with tackling air quality that might adversely affect the ecosystem, and so on, until there would be one holistic, comprehensive agenda for managing a seemingly unlimited set of interconnected resources that cross multiple jurisdictions. Presumably, moreover, this hypothetical “super” agency would need to have regulatory authority over every policy area that affected the health of the environment—including transportation policy, energy policy, and land use. Even thinking about this is exhausting. Assuming it were politically feasible, an agency that tried to cover this much ground would be technically overwhelmed and would likely suffocate in its own bureaucracy. Creating a mega-agency is fraught with problems. Even when all of the agencies in question are part of the same level of government, combining them effectively may be much more difficult than one might think.³³¹

Thus, addressing environmental problems and managing complex natural resources will necessarily involve multiple agencies with a variety of expertise and multiple levels of governments with differing capacities. The need to overcome the fragmentation inherent in this approach, however, requires looking for opportunities for integration, coordination, and information-sharing. This is what the idea of modularity is meant to capture. We also contemplate the possibility of multiple, overlapping modular structures addressing a variety of problems. For example, an agency might participate in a variety of collaborative exercises, each of which might have some features of modularity: a Habitat Conservation Plan; a basin-based water quality and resource management program; a regional air pollution plan; and a multi-party negotiation aimed at regulating an industry sector.³³² This creates the possibility that the agency could help cross-fertilize between these projects, adapting successful solutions in one context to problems in other contexts. Overlapping membership also increases the likelihood of informal cooperation among the participants in different modular structures. By preserving the individual units rather than transferring authority to some higher-

331. “[I]f there is one proposition on which consensus among students of public administration is firm and widespread, it is that reorganization normally produces little of value at a very high cost in time, energy, and personal anxiety.” BARDACH, *supra* note 309, at 16.

332. For a description of HCP or XL negotiations, see Freeman, *supra* note 2, at 191–95.

level or consolidated entity, the modular structure creates the possibility of useful synergies.

Given the complex nature of environmental problems and natural resource management, there is no alternative to adopting a more modular approach, with its emphasis on collaborative processes and negotiated solutions. Litigation will always occur, but it is not a useful, or even viable, method of planning, coordination, and management. This recognition leads, inexorably, to concerns about the professional training of those who would lead or work in modular institutions. What discipline adequately prepares professionals—equips them with the necessary skills—to both build and participate in modular structures? Certainly not, we are sad to say, law schools. Modularity requires a more expansive understanding of the role of the environmental lawyer than a traditional legal education, with its ongoing emphasis on litigation and inordinate focus on courts, allows. In a regime of modular regulation, contests over legality will remain important, and being adversarial will sometimes be absolutely necessary. We will be the first to point out that litigation campaigns by environmental groups are largely responsible for gains in environmental protection achieved over the last thirty years, for huge losses averted, and for conservation, such as it is, of our natural resources. But as in corporate law, much of what lawyers do in the future, we propose, will be transaction rather than litigation oriented. Increasingly, the emphasis will be on structuring the governance arrangements and designing the regulatory tools to implement multi-party agreements, with litigation mostly functioning as a background threat. Thus, modular regulation will, among other things, place new demands on law schools to conceptualize these issues as design problems and to train students to deal with them creatively. In proposing modular environmental regulation as an alternative worth pursuing, spelling out its central features, and providing a case study as concrete illustration, we hope that this Article has taken a first step in that direction.