Marine Ecosystem Management & A "Post-Sovereign" Transboundary Governance

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TABLE OF CONTENTS

I. INTRODUCTION

This paper argues that for purposes of managing transboundary environment problems in general, and marine ecosystems in particular, the role of international law as traditionally understood is somewhat overrated.[1] Binding international legal obligations owed by states to

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1. Some recent legal scholarship expands the definition of what counts as international law. *See, e.g.*, Andrew Guzman, *A Compliance-Based Theory of International Law*, 90 CAL. L. REV. 1823, 1825 (2002) (stating that "soft law should be considered

other states often turn out to be a good deal less important in environmental problem solving than is commonly supposed by many international lawyers, legal scholars, and environmental NGOs (non-governmental organizations). Specifically, this paper argues that emphasis on binding multilateral environmental agreements among sovereign states is often misplaced and possibly even counterproductive, insofar as it threatens to divert attention from more promising strategies for managing important categories of transboundary environmental problems. These strategies typically involve novel multi-party regional collaborative governance arrangements that include sub-national and non-state actors as well as sovereign states. Such strategies seek integrated and adaptive management at ecosystem scales. This open-ended, experimentalist problem-solving approach calls into question the primacy of fixed rules of obligation owed by states to other states.

This argument is not grounded in the usual Neo-realist objections to the role of international law. Neo-realists argue that international law operates mainly as a rhetorical smokescreen that imposes little real constraint on the self-interested actions of coldly rational, calculating, power-maximizing sovereign states.[2] Numerous commentators have pointed out that the Neo-realist view is difficult to square with the level of genuine cooperation that now exists in the international environmental arena,[3] but such longstanding debate is beyond the scope of this paper.

Building on the recent work of Eyal Benvenisti,[4] I argue that international legal agreements among states—and more specifically, multilateral agreements consisting of fixed, binding, rules of obligation owed by states to other states—are a suboptimal instrument for addressing some important categories of transnational environmental problems. This is so for several reasons.

II. STRUCTURAL LIMITATIONS OF PUBLIC INTERNATIONAL LAW

As any student of collective action readily grasps, public international law is limited in its scope and effectiveness by deep structural infirmities. In general, the bedrock principle of state sovereignty and the corollary rule of consent make it exceedingly difficult to get sovereign

international law"); Jutta Brunnee & Stephen J. Toope, *The Changing Nile Basin Regime: Does Law Matter?*, 43 HARV. INT'L. L.J. 105 (2002).

2. *See* Guzman, *supra* note 1, at 1836–37 (summarizing Realist and Neo-realist arguments); Stephen D. Krasner, *International Law and International Relations: Together, Apart, Together?*, 1 CHI. J. INT'L L. 93, 94–95 (2000).

3. *Cf.* Guzman (stating that the Neo-realist view is difficult to reconcile with the level of effort that states seem to invest in international agreements generally).

4. *See* EYAL BENVENISTI, SHARING TRANSBOUNDARY RESOURCES: INTERNATIONAL LAW AND OPTIMAL RESOURCE USE (2002).

states to agree to be bound by international legal rules and norms unless they see a clear self-interest in doing so. Given the "public good" character of international environmental progress, the temptation for any nation to free-ride is very strong. Moreover, even if states do manage to reach agreement, nominally binding rules may fall victim to free-riding for the second time at the implementation stage, in the form of under-compliance. Exacerbating this problem, sanctions for non-compliance are typically quite limited in scope and effectiveness—and not merely by accident or inattention, but by design, because sovereign states are reluctant to agree to be bound by stronger measures.[5] In addition, given the diffuse and collective nature of the benefits that flow from environmental cooperation, rarely would any state have adequate incentives to hold itself out as enforcer of the terms of a multilateral environmental agreement, even if dispute resolution mechanisms and meaningful sanctions were available.

At first blush, these considerations might appear to militate against any kind of meaningful international environmental cooperation. Note, however, that the scope of these claims is actually somewhat narrower. These arguments are rooted in an analysis of the interests of states *qua* states and go mainly to the limitations of a particular kind of transnational environmental cooperation. That is, cooperation in the nature of mutually agreed, reciprocal, legally binding, enforceable obligations among sovereign states—in sum, what we usually think of as international law.

But transnational environmental cooperation need not be confined to this sort of familiar state-centric legal arrangement. Transnational environmental cooperation is not only possible but is in fact occurring, albeit not exclusively or even primarily through the vehicle of inter-sovereign legal agreements. To be sure, sovereign states still matter and will continue to play a major role in transnational environmental politics and governance for the foreseeable future. But because their incentives and capacities are often poorly matched to the nature and scope of the environmental challenges to be addressed, sovereign states are in crucial respects suboptimal parties, individually and collectively, to whom we entrust the task of solving complex transnational environmental problems. This reflects the limitation of international law in this regard, in its near-exclusive focus on sovereign states and inter-sovereign obligations to

5. *See* ABRAM CHAYES & ANTONIA HANDLER CHAYES, THE NEW SOVEREIGNTY: COMPLIANCE WITH INTERNATIONAL REGULATORY AGREEMENTS (1995).

address problems that might better be addressed through other kinds of governance arrangements.

III. SCALE MISMATCHES

Obviously, some environmental problems cannot be resolved within the territorial boundaries of sovereign states because the geographical scope of the problem extends beyond state boundaries. But international law is not the only instrument available to address these sorts of transnational problems; nor are global multilateral treaties the only alternative to state-by-state decision making.

In both academic and popular discourse, international environmental challenges are habitually described as problems of the "global commons," but that well-worn metaphor is often misleading. A small handful of environmental problems—ozone depletion and global climate change being leading examples—are genuinely global in character, both in the sense that the *problem* exists indivisibly on a global scale and because requisite *solutions* ultimately must operate on a global scale lest externalities generated in some locations undermine progress elsewhere. But these sorts of truly "global-global" problems—problems that occur globally and indivisibly and therefore require global-scale solutions—are in fact the exception, rather than the paradigmatic case they are often assumed to be. More commonly, environmental problems are ubiquitous, in some cases even globally distributed, but are nonetheless divisible into smaller subsets that do lend themselves to sub-global solutions at the regional, national, or local level. For these problems, environmental progress can be made in particular localities, nations, or regions without serious threat that lack of cooperation from other quarters will undercut the effectiveness of those efforts. One example of such a globally distributed but locally soluble problem is the loss and degradation of wetlands, addressed internationally though the Ramsar Convention on Wetlands of International Importance.[6] Wetland loss is occurring all over the planet; the problem is globally distributed. But the failure of some nations to address the problem does not seriously impinge upon the ability of others to do better, and to that extent global solutions are not essential. If a country like Sweden or the United States, or a region like Western Europe or North America, undertakes to protect its wetlands, it can proceed unilaterally or on a regional basis without fear that less vigorous efforts in other parts of the world will somehow undercut whatever environmental gains

6. Ramsar Convention on Wetlands of International Importance Especially As Waterfowl Habitat, Feb. 2, 1971, 996 U.N.T.S. 245.

might result from sound wetlands management where it is practiced.[7] To characterize the wetlands problem as a "global commons" problem just because it is global in distribution, or because some of the benefits of wetlands have a transnational "public good" character, is therefore highly misleading. It suggests wrongly that progress is impossible anywhere unless all parties cooperate. Similar arguments can be made with respect to protection of other habitat or ecosystem types, including marine and coastal ecosystems, as I shall argue shortly.

Many other important categories of environmental problems are genuinely transnational, in the sense that solutions do require cooperation across the boundaries of two or more neighboring states. But a good many of these are regional rather than global in character.[8] One example is the management of international watercourses. Sound management of the Danube, for instance, does not in any meaningful way depend upon the level of cooperation achieved in managing the Mekong, or vice-versa. Another example is acid deposition ("acid rain"), which typically occurs over continental rather than global scales. In these cases, solutions may require cooperation among all states within the relevant watershed or airshed, but watersheds or airsheds could in principle be managed effectively even in the absence of global rules. Of course, there is nothing wrong with global cooperation in these areas if it can be achieved, but given the difficulties inherent in negotiating strong global inter-sovereign agreements, one must question the enormous effort that goes into negotiating global rules concerning what are essentially regional problems. Any set of global rules for managing international watercourses, for example, will almost inevitably prove incomplete and inadequate to the task of actually managing any particular watershed in an environmentally sound way. Under such circumstances, the rules set down by a global multilateral agreement will operate at best as a set of imprecise and incomplete defaults around which parties will bargain to more specific,

7. To be sure, because many wetlands serve as habitat for migratory bird species, loss of wetlands in one state or region might impose some negative environmental externalities on other states, making transnational cooperation desirable. But even those sorts of spillover effects are typically confined to particular regional "flyways." Many of the environmental benefits associated with wetlands, such as flood control, water filtration, groundwater recharge, and provision of habitat for local assemblages of plant and animal life, can be had through sound local management even if other wetlands are badly managed.

8. I use the term "regional" somewhat loosely here to refer to any problem that is transnational but less than global in geographic scope, ranging from two or more geographically contiguous states.

regionally tailored solutions. Viewed in that light, global rules might prove marginally helpful as a set of background conditions influencing the bargaining positions of the parties, but in themselves are neither necessary nor a sufficient condition for the kind of transnational cooperation needed to achieve ecologically sound watercourse management.

Somewhat more provocatively perhaps, I contend that even the oceans—typically viewed as the quintessential "global commons"—should be reconceptualized as a complex set of (admittedly interrelated) regional problems, requiring an equally complex set of regional solutions. It is a familiar temptation to think of the oceans as a single, vast, and indivisible global ecosystem. Yet contemporary science tells us that the oceans are far from an undifferentiated whole. Even though their parts are deeply interrelated, the oceans are more accurately seen as a rich mosaic of interdependent and overlapping local and regional biotic communities, habitats, and geochemical-physical processes, arrayed in distinctive bio-regional patterns—a web of distinctive ecosystems.[9] Some of these ecosystems face familiar threats from land-based pollution, overfishing, and destruction of wetlands, mangrove forests, and other critical coastal and nearshore habitats. Notice, however, that many of these problems tend to be concentrated in nearshore waters and coastal regions, that is, primarily within the territorial seas and Exclusive Economic Zones of coastal states, within their internal waters (such as bays and estuaries), on coastal lands, and in interior watersheds that affect conditions in estuaries and nearshore waters.

Like the problem of wetlands loss, ecologically sound management of these nearshore marine and coastal ecosystems does not necessarily require global solutions. In principle at least, progress in managing many of these ecosystems could be made within particular localities, within nations, or within transboundary regions, even if all states cannot agree to cooperate in that effort. To be sure, the interconnectedness of marine ecosystems means that poor management of some nearshore and coastal areas will produce environmental externalities elsewhere; and to that extent, as with the wetlands example, transnational cooperation may ultimately be desirable. It would be a serious mistake, though, to think of the oceans as a purely "global" problem, requiring purely global solutions. As with wetlands and watercourses, universally-agreed global rules are neither a necessary nor a sufficient condition for improved marine ecosystem management. Important environmental gains can be

9. *See* Richard L. Hill, *Biologist Advocates New Rules for Ocean*, THE OREGONIAN, Feb. 16, 2003, at A 19 (reporting findings of an interdisciplinary team of marine scientists who say the oceans are "not just one big neighborhood, but are chopped up into smaller ones" which can be managed at smaller scales "on a neighborhood-by-neighborhood basis").

had at regional, national, and local scales, even if efforts lag in other places.

In cases where the affected regional ecosystem extends beyond the boundaries of a single state, some kind of transnational cooperation obviously will be necessary. But another kind of geographical mismatch comes immediately into play. For in addition to crossing state boundaries, coastal and marine ecosystems tend to divide states internally. A troubled regional marine ecosystem—such as the Gulf of Maine, shared by several U.S. New England states and Canadian Atlantic provinces—might profoundly affect coastal regions of several neighboring nations, for example, but be of little concern to people in the interior or along some other distant shore of any of those states. To be sure, some activities in the interior—particularly pollution, habitat loss, and hydrological alterations in the watersheds of tributary rivers—can have significant downstream effects on coastal and marine ecosystems, so that to improve conditions in the marine area we might also need to co-manage parts of the interior. But very often, coastal communities in neighboring states will have stronger common interests in how a regional marine ecosystem is managed than do the coastal and interior regions of a single state. Scale mismatches of this nature often leave states with relatively weak incentives to address transnational (or for that matter "national") marine environmental problems, which may be internally divisive or viewed as problems of a merely "regional" rather than truly "national" concern.

More generally, states *qua* states often have relatively weak incentives to engage in environmental protection, faced as they are with competing or conflicting domestic political imperatives and priorities, as well as competing diplomatic goals. Leaving the management of transnational environmental problems entirely to sovereign states, then, especially under a rule that requires unanimity and consent among all states before action is taken, looks like a recipe for inaction or for weak, least-common-denominator approaches. A more promising strategy might be to "build from the ground up" by more directly involving the parties that have the most tangible stake in the outcome, i.e., directly affected communities, industries, and interest groups.[10] States, of course, will almost certainly enter this picture at some point, and they possess resources and unique capabilities that allow them to play a prominent role.

10. *See id.* (reporting marine scientists' conclusion that management at local scales encourages emphasis on local benefits and builds local community support for marine environmental protection).

In sum, a strategy that relies exclusively or excessively on states to address transboundary environmental problems is likely to find a tough going. Strategies that involve other actors whose interests are better matched to the scale and nature of the resource and with greater incentives to initiate and sustain action have a better chance of success.

IV. CAPACITY MISMATCHES: FROM REGULATION BY FIXED RULE TO ADAPTIVE ECOSYSTEM MANAGEMENT

Growing recognition of the complexity, pervasiveness, and mutual interdependence of environmental problems is prompting a rethinking of environmental regulation and natural resource management strategies, both within the nation state and at the international level. Recent years have seen a marked shift from a regulatory model based on top-down, piecemeal, command-style fixed rules, towards a model based on locally or regionally tailored, broadly integrative, collaborative, experimental, and adaptive polyarchic governance arrangements that seek to manage entire ecosystems.[11]

The characteristic model of environmental regulation that emerged from the 1960s onward was rule-based and rule-bound.[12] It sought to solve environmental problems by imposing and enforcing fixed uniform rules, understood as binding commands by the sovereign state to which all subject to its jurisdiction must conform. This approach implicitly assumes that an expert decision-maker—the regulatory agency (an arm of the state)—would identify the most important environmental problems, gather sufficient expert information to specify effective solutions, express those solution as a series of specific legally binding commands, and finally enforce those commands by employing the coercive sanctioning power of the state. Characteristically, this model approaches complex problems by fragmentation, attempting to carve the larger ecological puzzle into smaller pieces that can be isolated and managed through categorical, command-style rules.

This conventional rule-making approach tends to focus regulatory effort on those aspects of environmental protection most susceptible to control by piecemeal categorical rules.[13] It typically emphasizes pollution

11. *See* Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267 (1998); Charles F. Sabel et al., *Beyond Backyard Environmentalism*, in BEYOND BACKYARD ENVIRONMENTALISM 3 (Joshua Cohen & Joel Rogers eds., 2000).

12. *See* A. Dan Tarlock, *The Future of Environmental "Rule of Law" Litigation*, 17 PACE. ENVTL. L. REV. 237 (2000); Bradley C. Karkkainen, *Environmental Lawyering in the Age of Collaboration*, 2002 WIS. L. REV. 555 (2002).

13. MARY GRAHAM, THE MORNING AFTER EARTH DAY: PRACTICAL ENVIRONMENTAL POLITICS (1999).

outputs over ecological conditions, pollution control over pollution prevention, large sources over small ones, and medium-by-medium and pollutant-by-pollutant rules over integrated approaches.[14] It tends to rely on fixed, highly prescriptive rules rather than flexible standards or adjustable goals and objectives. These characteristics of environmental regulation are popularly captured in the term "command-and-control."

The limitations of this approach have been the subject of much commentary. Despite significant reductions in pollution from the largest sources, diffuse sources remain largely uncontrolled.[15] Uncoordinated piecemeal regulatory programs impose redundant costs on both administrators and regulated entities, while critical problems fall between the cracks.[16] Rules crafted under necessarily fragmentary and incomplete information tend to be inflexible, either underinclusive or overinclusive, and costly to promulgate and implement. Sometimes rules work at cross purposes with other rules.[17] Most importantly, even as progress is made on some narrowly defined problems, ecosystems continue to be fragmented and degraded.[18]

Recently, however, a new regulatory model has begun to emerge, one that aims at integrated management of watersheds, estuaries, enclosed or semi-enclosed seas, old-growth forests, and other critically threatened ecosystems. Ecosystems exhibit unique local characteristics and therefore require context-sensitive management. Scientists and leading policy-makers have also come to appreciate that ecosystems are complex, dynamic systems composed of numerous mutually interdependent components and processes. These processes are often poorly understood due to gaps in basic scientific understanding, non-linear threshold effects, and high degrees of inherent stochasticity.[19] In the words of one leading ecologist,

14. Daniel A. Farber, *Triangulating the Future of Reinvention: Three Emerging Models of Environmental Protection*, 2000 U. ILL. L. REV. 61 (2000) [hereinafter Farber, *Reinvention*]; Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21 (2001).

15. U.S. EPA, Edgewater Consensus (1994).

16. Dennis A. Rondinelli, *A New Generation of Environmental Policy: Government-Business Collaboration in Environmental Management*, 31 ENVTL. L. REP. 10891, 10895 (2001). Stewart, *supra* note 14.

17. Daniel A. Farber, *Environmental Protection as a Learning Experience*, 27 LOY. L. A. L. REV. 791, 793–94 (1994) [hereinafter Farber, *Learning*].

18. U.S. EPA, Edgewater Consensus, *supra* note 15.

19. Lance H. Gunderson, *Stepping Back: Assessing for Understanding in Complex Regional Ecosystems*, *in* BIOREGIONAL ASSESSMENTS: SCIENCE AT THE CROSSROADS OF MANAGEMENT AND POLICY (K. Norman Johnson et al. eds., 1999).

"Ecosystems turn out to be not only more complex than we think—they are more complex than we *can* think."[20] Given the complex interdependencies of ecosystem components and processes, they must be managed as systems, employing an integrated, holistic, "place-based," ecosystem-specific management approach.[21] In place of program-delimited rules, then, a high degree of inter-program and interagency policy coordination is required; and in place of uniform regulatory requirements, context-sensitive locally tailored solutions are preferred.

Complexity in ecosystem processes also demands that managers eschew reliance on fixed rules. Advocates of an ecosystem-oriented approach urge the adoption of flexible and adaptive policy-making approaches based on principles of continuous experimentation and dynamic adjustment in response to advancements in scientific understanding, new and continuously improving information, changing conditions, and the observed effects of past management efforts.[22] Within this framework, every policy decision is understood as necessarily provisional. In short, an experimentalist "rolling rule" approach is emerging as the dominant paradigm in ecosystem management.[23] These technical features of the new model of environmental regulation are captured in the term "adaptive management," which has gained widespread currency in the scientific community and among the policy-makers most attuned to an ecosystems-oriented approach to environmental management.[24]

This new regulatory model has far-reaching institutional implications. If ecosystems are to be managed effectively, governance structures must be matched to the eco-geographical *scale* of the resource to be managed. That scale typically does not map well onto conventional, territorially-delimited political and jurisdictional boundaries.[25] In some cases, the nation-state will map across numerous and diverse ecological systems

20. REED F. NOSS ET AL., THE SCIENCE OF CONSERVATION PLANNING: HABITAT CONSERVATION UNDER THE ENDANGERED SPECIES ACT (1997).

21. Norman L. Christensen et al., *The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management*, 6(3) ECOLOGICAL APPLICATIONS 665 (1996); C. S. Holling et al., *Science, Sustainability and Resource Management*, *in* LINKING SOCIAL AND ECOLOGICAL SYSTEMS: MANAGEMENT PRACTICES AND SOCIAL MECHANISMS FOR BUILDING RESILIENCE 342 (Fikret Berkes & Carl Folke eds., 1998); Gunderson, *supra* note 19; U.S. Forest Service Committee of Scientists, Sustaining the People's Lands: Recommendations for Stewardship of Forests and Grasslands into the Next Century (1999).

22. Christensen et al., *supra* note 21, at 669–71.

23. Dorf & Sabel, *supra* note 11; Bradley C. Karkkainen et al., *After Backyard Environmentalism: Toward a Performance-Based Regime of Environmental Regulation*, 44 AMER. BEHAVIORAL SCIENTIST 692 (2000).

24. KAI N. LEE, COMPASS AND GYROSCOPE: INTEGRATING SCIENCE AND POLITICS FOR THE ENVIRONMENT (1993); Gunderson, *supra* note 19, at 35–36.

25. Reed F. Noss, *Some Principles of Conservation Biology, as They Apply to Environmental Law*, 69 CHI. KENT L. REV. 893 (1994).

and must be subdivided into smaller functional units. In other cases, the ecological system will straddle territorial boundaries, making transboundary cooperation imperative. Standard territorially delimited subnational units of government—states, counties, and municipalities in the U.S. context—are also typically a poor fit, either too large or too small, or both simultaneously. At a minimum, then, a high degree of intergovernmental coordination is typically required to manage ecosystems at the appropriate eco-geographical scale.

Beyond intergovernmentalism, however, ecosystem management demands a deeper reconfiguration of governance structures. Ecosystem management requires integrated management of the multiple resources and stressors that jointly comprise the ecological whole. Yet the conventional regulatory structures of the nation-state are poorly matched to the *scope* of this management task. Competencies are typically fragmented among multiple, mission-specific governmental agencies and (especially in federal systems like the United States) further dispersed over multiple tiers of government—federal, state, and local.[26] Other crucial and scarce resources—land, economic decision-making power, knowledge, and expertise—are largely in the hands of private (non-state) actors, including landowners, businesses, the scientific community, and not-for-profit nongovernmental organizations (NGOs). In principle, of course, the state as sovereign could command or entice any of these non-state actors to conform to a state-devised and state-directed plan to protect the ecological resource. Yet the complex and dynamic nature of ecosystems, coupled with the corollary need to maintain a flexible, dynamic, continuous-learning approach, place it beyond the capacity of any state agency or the state as a whole to develop such a plan *ex ante*.

In response to this crisis of state competence, the state has little choice but to enlist the aid of non-state actors—including intergovernmental organizations (IGOs), NGOs, the business community, landowners, and the independent scientific community—and draw on their expertise and resources, as well as their commitment to use the competencies at their disposal to join in an open-ended effort at collaborative problem-solving. These arrangements place state actors side-by-side with non-state actors in a joint enterprise to define and assess the ecological problem to be addressed, propose and evaluate provisional solutions, determine and

26. Holling et al., *supra* note 21.

execute management plans, monitor outcomes, and assess and revise joint plans as necessary throughout the management effort. Thus expertise, resources, and capacities are pooled in hybrid public/private problem-solving governance arrangements.[27] Nor can that joint effort simply be a once-off advisory exercise, in which non-state parties advise the state as it devises a rule that then becomes final and binding on all the state's subjects through a conventional exercise of state sovereignty. As we have seen, continuous learning, experimentation, and "adaptive management" remain essential elements of the enterprise, in which non-state parties operate as partners with sovereign states. What emerges, then, is co-governance of the ecosystem by the state and its various non-state partners whose participation may be as critical to the project's ultimate success as is the participation of the state itself.[28] In the process, conventional distinctions between state and non-state, sovereign and subject, and command and compliance become blurred.

The emphasis in these problem-solving institutional collaborations is neither on imposing rules that constrain the exercise of sovereignty from above nor on achieving inter-sovereign horizontal diffusion of successful approaches. Instead, the new governance arrangements amount to an informal and largely tacit amendment to conventional understandings of the nature of sovereign authority.[29] Although states remain leading actors in these collaborative problem-solving arrangements, authority to address problems traditionally considered to fall within the province of state sovereignty is reassigned to hybrid constellations of state and non-state actors. The effective locus of governance thus devolves from the sovereignty of the state to dynamic and continuously evolving polyarchic arrangements. I call this phenomenon "post-sovereign" governance.

Of course, non-state actors have long been involved in conventional law and policy-making processes in consultative, advisory, or "lobbying" capacities. In the new governance arrangements, however, the role of non-state actors is more than merely that of consultant, advisor, or lobbyist to a sovereign authority that retains ultimate discretion to define policy and to issue binding law. Instead, decision-making—governance itself—occurs in and through ongoing collaborations in which states and non-state actors work side-by-side as co-participants, co-authors, and co-executors of policy, roughly as formal equals although certainly often of unequal capacity and resources.

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27. Karkkainen et al., *supra* note 23.
28. *Id.*
29. Dorf & Sabel, *supra* note 11; Sabel et al., *supra* note 11.

These sorts of governance arrangements, furthermore, should not be understood merely as external horizontal or vertical constraints on state sovereignty. Instead, they involve a partial disaggregation or "unbundling" of the package of powers that traditionally have been thought to constitute state sovereignty.[30] Specifically, the state's power as sovereign to regulate for protection of the environment and conservation of natural resources within its territorial jurisdiction is detached and reassigned to a new hybrid institutional form. There it is recombined and merged with the powers, resources, expertise, and competencies of a variety of other state and non-state actors, creating a wholly new governance structure—the only structure capable of acting at the appropriate eco-geographical scale and with an adequate scope of authority to meet the demands of integrated ecosystem management. Characteristically, however, these new arrangements are themselves open, polycentric, and continuously evolving.[31] Key elements of this model can be seen, *inter alia*, in the governance arrangements for the Great Lakes and some other international freshwater systems, the Baltic and some other regional seas, and, in certain crucial respects, the global ozone depletion regime.

These new arrangements are not confined to the international arena. Strikingly similar multi-party collaborative governance arrangements are also emerging within nation-states to address similar categories of complex environmental problems occurring wholly within the state's conventional territorial jurisdiction, arguably leading to a partial disaggregation (or at minimum, a significant redefinition) of state sovereignty even within its own territorial borders. This paper draws on an advanced example from the U.S. experience, the Chesapeake Bay Program, which closely resembles in form and function the kinds of arrangements now also emerging at the international level and which has served as a leading prototype for some of the most important innovations occurring elsewhere.

30. Anne-Marie Slaughter, *The Real New World Order*, FOREIGN AFFAIRS, Sept./Oct. 1997 183; S. SASSEN, GLOBALIZATION AND ITS DISCONTENTS: ESSAYS ON THE NEW MOBILITY OF PEOPLE & MONEY (1998).

31. Henry A. Regier, *Great Lakes-St. Lawrence River Basin Assessments: Case Study*, *in* BIOREGIONAL ASSESSMENTS: SCIENCE AT THE CROSSROADS OF MANAGEMENT AND POLICY 135, 138–39 (1999).

V. LEADING CASES

A. The Chesapeake Bay

By most accounts, the Chesapeake Bay program is the most extensive, mature, institutionally complex, and successful of the new ecosystem governance arrangements. It is widely viewed as a model for other large estuaries and highly stressed marine ecosystems.[32] Although the Chesapeake Bay and its tributaries are located entirely within the internal waters of the United States, the Chesapeake Bay program nonetheless represents a clear example of the institutional architecture I am calling "post-sovereign."

As North America's largest estuary, the Chesapeake Bay was long prized for its scenic beauty, recreational opportunities, and prolific fish and shellfish production, but it suffered severe declines in environmental conditions and living resources in the late 20th Century, despite the emergence of stringent pollution control laws. In response, federal, state, and local governments, together with local businesses, residents, and NGOs, joined forces to create the Chesapeake Bay program, an ambitious regional collaborative ecosystem management system seeking integrated management of a suite of resources and environmental stressors in the Bay itself and in the watersheds of its tributary streams.

Although the Clean Water Act (CWA) stringently regulates large point-source polluters, it does not effectively reach pollution from diffuse, non-point sources such as farms and city streets, nor does it mandate integrated management of the aquatic ecosystem. Overall water quality, therefore, remained poor even after the CWA's enactment, and the adverse effects of pollution were aggravated by destruction or degradation of coastal wetlands, riparian forest buffers, submerged benthic habitats, and filter-feeding organisms that play critical roles in regulating water quality and ecosystem health. Over-harvesting depleted crucial resources like filter-feeding oysters that, when abundant, play a crucial role in maintaining water quality. It became clear at an early stage that fixed and uniform national pollution control rules would not be adequate to address this complex of interrelated problems.[33] The Chesapeake Bay program's chief accomplishment is the development of a continuously evolving set of institutional arrangements that allow it to address these interrelated problems in response to rapidly changing understandings of

32. Robert Costanza & Jack Greer, *The Chesapeake Bay and its Watershed: A Model for Sustainable Ecosystem Management?*, *in* BARRIERS AND BRIDGES TO THE RENEWAL OF ECOSYSTEMS AND INSTITUTIONS (Lance H. Gunderson et al. eds., 1995) [hereinafter BARRIERS AND BRIDGES].

33. *Id.*

the nature of the threat and to implement appropriate policy responses.[34]

Spurred by a broad citizen movement rallying under the motto "Save the Bay!," Congress funded a major research program in the 1970s to assess the Bay's status and the causes of its decline. That report revealed a complex web of interrelated causes and alarming symptoms that spanned several states in the region.[35] Responding to these findings, the U.S. Environmental Protection Agency (EPA), the states of Maryland, Virginia, and Pennsylvania, and the District of Columbia, signed the Chesapeake Bay Agreement in 1983, committing themselves to joint efforts to improve and protect water quality and living resources of the Chesapeake Bay's estuarine systems. The Agreement established a core institutional framework, articulated a shared long-term vision, and set in motion an iterative process of ongoing scientific investigation, evaluation, and revised substantive commitments.

A second Chesapeake Bay Agreement in 1987 marked the next phase in this evolutionary process. It established monitoring of biological indicators of ecosystem health as the bedrock of future management efforts and identified the productivity, diversity, and abundance of the Bay's living resources as the best ultimate measures of the Chesapeake Bay's condition. The 1987 Agreement set ambitious performance improvement targets, including a goal of reducing nutrient loadings by forty percent. When subsequent studies revealed that nutrient loadings in various tributaries had differential impacts on water quality, the parties again revised system-wide goals and codified them in a 1992 commitment to develop tributary-specific nutrient reduction targets and implementation plans. The increasingly localized nature of these tasks led the Chesapeake Bay program to devolve crucial management responsibilities to semi-autonomous, public/private tributary teams composed of government officials, scientific experts, agricultural and industry representatives, and citizen volunteers who became experts on problems and location-specific solutions in their own tributaries, but whose local efforts remain nested within the larger basin-wide institutional framework and policy goals.

Subsequent directives added progressively more detailed commitments in such areas as toxic reduction, habitat restoration, riparian forest buffers, wetlands protection, agricultural non-point source pollution reduction, and removal of stream barriers to improve fish passage. The most recent

34. Sabel et al., *supra* note 11.
35. Costanza & Greer, *supra* note 32.

basinwide agreement, known simply as Chesapeake 2000, is the most detailed and comprehensive recovery plan to date. It set ambitious targets for the restoration of oyster beds, wetlands, riparian buffers, and submerged aquatic vegetation; called for the development of multi-species management plans to protect sensitive biological communities; and committed to develop and implement stream-specific watershed management plans and stream corridor restoration goals. It also addressed land use goals, calling for a thirty percent reduction in the rate of urban sprawl and permanent preservation of twenty percent of the lands in the watershed.

Complex institutional arrangements have co-evolved alongside these increasingly comprehensive programmatic commitments. At the center of these arrangements is an Executive Council, consisting of signatories to the framework agreement, responsible for setting overall goals and objectives. At the next tier is a permanent Implementation Committee, comprising of representatives from 27 federal and regional agencies, which develops and carries out more fully elaborated ecosystem restoration plans. The Executive Council and Implementation Committee carry out their work in consultation with a Scientific and Technical Advisory Committee, a permanent Citizens Advisory Committee, and a Local Government Advisory Committee. Details of the Implementation Committee's work are delegated to subcommittees on monitoring, modeling, research, and habitat restoration, as well as tributary-specific teams. Coordinating all these efforts is an EPA liaison office. These polyarchic arrangements ensure that a variety of governmental and non-governmental voices have opportunities to help shape overall program direction and contribute their own expertise and competencies to a joint collaborative enterprise that is collectively better-informed and more capable than any of its constituent parts.

Participants in the Chesapeake Bay program have come to recognize that the more they learn about the Bay's complex ecology, the more surprises they will encounter. The Chesapeake Bay program not only expects surprises, but aggressively seeks them out. Much of the Chesapeake Bay program's overall effort goes into ecosystem-situated scientific investigation; monitoring of critical stressors and biological indicators; computerized modeling of the Bay's complex mosaic of ecosystem processes; and Geographic Information System mapping to facilitate synthesis, analysis, and presentation of data on basin-wide or location-specific scales—which all feed back into continuous reevaluations of policy. The one constant is that the Chesapeake Bay program's goals, objectives, and policy measures are invariably viewed as provisional, subject to iterative refinement or

large-scale modification as needed in a pragmatic mutual adjustment of means and ends.[36]

To carry out these efforts, the Chesapeake Bay program employs a grab bag of regulatory techniques, legal instruments, and voluntary measures. These sometimes take the form of legislation or administrative rules at the federal, state, or municipal levels, binding throughout the region or in some of its parts. Sometimes they consist of largely procedural framework agreements within which subsequent objectives and implementation measures may be progressively iterated. At other points, they take the form of non-binding voluntary guidelines, technical or financial assistance to private parties, or pleas for voluntary cooperation coupled with social pressure on non-cooperators.[37] The Chesapeake Executive Council often advances proposed measures through joint executive decrees called "directives." Though of dubious legal status, these are viewed, at a minimum, as morally binding commitments on the part of each executive to use all available powers and authorities to carry out the stated aims. Throughout the process, the familiar boundaries between "law" and "not-law," "public" and "private," and "sovereign" and "subject" grow indistinct. What matters is what works, and that varies with the circumstance.[38]

The Chesapeake Bay example suggests that the trend toward partial disaggregation, recombination, and redefinition of the core attributes of state sovereignty is not confined to the international arena. Instead, a distinctive problem-solving, polyarchic governance model is emerging in response to complex ecological problems that overwhelm the capacities of the sovereign state, whether problems of that character occur within the state's territorial boundaries or partially beyond them.

Developments in the Chesapeake Bay region should also be understood as roughly analogous in value in the international arena to the theory of dual sovereignty that informs U.S. federalism. Under international law, the U.S. government is presumed sovereign over persons and natural resources within its territorial jurisdiction. As a matter of U.S. law, however, the (subnational) state governments are also considered quasi-sovereign entities, and the federal government is a government of limited, enumerated powers. Some matters fall within the exclusive competence of the states, not merely at the sufferance of the federal

36. Sabel et al., *supra* note 11.
37. Costanza & Greer, *supra* note 32.
38. Sabel et al., *supra* note 11.

government, but as a matter of fundamental legal right. In other matters, responsibilities are broadly shared. In a few areas, including foreign affairs and the regulation of commerce among the several states, the federal role is exclusive.

Given the limited dual sovereign role of the states, the law of interstate relations in the U.S. is sometimes seen as having precedential value in international law, just as international law has been taken, by analogy, as the source of principles to adjudicate disputes among U.S. states. The argument advanced here, then, is that the new hybrid governance arrangements in the Chesapeake Bay reflect a model of collaboration readily adaptable to the international arena. In this model, multiple sovereigns—here, the federal government and the several states—effectively cede and recombine crucial elements of their sovereign powers, joining forces in a new problem-solving hybrid institutional arrangement that also embraces non-state actors. That arrangement, as the Chesapeake Bay program's partners have discovered, is better suited to the complexities of ecosystem management than traditional exercises of sovereign prerogative.

B. The U.S.-Canadian Great Lakes

The joint U.S.-Canadian effort to manage the Great Lakes ecosystem extends the Chesapeake Bay model to a transnational resource. Forming a large portion of the U.S.-Canadian border in the heavily industrialized heartlands of both nations, the Great Lakes comprise about twenty percent of the fresh surface water on the planet. Like the Chesapeake Bay program, Great Lakes management efforts emerged from recognition that, despite significant progress under conventional rule-based regulation in reducing gross pollutant inputs from industrial point sources and municipal wastewater systems, the ecosystems of the lakes remained badly degraded by a complex of interrelated problems. These included excess nutrients, airborne toxic pollutants, contaminated sediments in rivers and harbors, declining fisheries, wetlands loss, and alteration of natural stream flows from approximately 6,000 tributaries across the 300,000 square mile basin, requiring a reorientation toward integrated management.[39] The management approach that has emerged to govern

39. W.J. Christie, *The Ecosystem Approach to Managing the Great Lakes: The New Ideas and Problems Associated with Implementing Them*, 26 U. TOL. L. REV. 279 (1995); George R. Francis & Henry A. Regier, *Barriers and Bridges to the Restoration of the Great Lakes Basin Ecosystem*, *in* BARRIERS AND BRIDGES, *supra* note 32, at 239–41; Henry A. Regier, *Great Lakes-St. Lawrence River Basin Assessments: Case Study*, *in* BIOREGIONAL ASSESSMENTS: SCIENCE AT THE CROSSROADS OF MANAGEMENT AND POLICY (1999).

the Great Lakes is arguably the premier example of successful transboundary collaboration in joint management of a freshwater aquatic ecosystem.[40]

The United States and Canada negotiated the first Great Lakes Water Quality Agreement in 1972, based on conventional pollution control approaches then emerging in the laws of both nations. Recognizing that conventional pollution control strategies would not be sufficient to restore ecosystem health in the Great Lakes, subsequent 1978 and 1987 revisions of the Great Lakes Water Quality Agreement explicitly embraced the goal of integrated ecosystem management throughout the Great Lakes basin.[41] Significant progress has been made in that direction through a deeply collaborative transnational effort that extends well beyond sovereign-to-sovereign relations to embrace subnational governments and the organs of civil society on both sides of the border. Co-collaborators include various federal agencies in both nations, eight U.S. states, two Canadian provinces, major ports and municipalities throughout the region, Native American tribes (U.S.) and First Nations (Canada), local and regional NGOs, leading businesses and trade associations, and the independent scientific community.[42]

Also playing leading roles are a series of binational non-governmental and intergovernmental bodies:

- Great Lakes United, an influential transnational federation of NGOs;
- the International Association of Great Lakes Research, a transnational scientific society;
- the Council of Great Lakes Governors, a coordinating body for the chief executive officers of the U.S. states;
- the Great Lakes Commission, a coordinating body for U.S. states and Canadian provinces;
- the Great Lakes-St. Lawrence Mayors Conference, a transnational coordinating body for municipal officials;
- the binational Great Lakes Fishery Commission, charged with coordinating management of fishery resources; and

40. Cf. PATRICIA BOYLE & ALAN BIRNIE, INTERNATIONAL LAW AND THE ENVIRONMENT 327–27 (2d ed. 2002) (describing Great Lakes management efforts as an exemplary model of successful transboundary ecosystem management); DAVID HUNTER ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 809 (2d ed. 2002) (stating that the Great Lakes management effort is "[o]ne of the most widely respected transboundary freshwater management initiatives").

41. Francis & Regier, *supra* note 39.

42. *Id.*; Regier, *supra* note 31, at 141–42.

- the International Joint Commission, a six-member binational commission established under the 1909 Boundary Waters Treaty to regulate lake levels and water diversions and to adjudicate international disputes concerning Great Lakes' resources.[43]

Although the latter has no direct management authority over environmental quality issues, it is recognized as an influential voice in the ongoing policy discussion. The International Joint Commission provides overall coordination, organizes high-visibility fora for public participation, produces independent critical evaluations of management programs and progress toward agreed goals and objectives, and sponsors subsidiary scientific, technical, and advisory bodies that are often highly influential in their own right.[44]

Like the Chesapeake Bay program, the Great Lakes initiative incorporates a "nested structure, devising strategies and coordinating management efforts at multiple scales, from local harbors and tributary watersheds to the basin as a whole."[45] Basin-wide efforts include the Binational Toxics Strategy, a voluntary effort developed through a broadly collaborative and participatory process that included industry groups as well as NGOs and governmental entities, and a Biennial State of the Lakes Ecosystem Conference, which invites collaborative partners to participate in periodic joint reassessment of progress, goals, plans, and implementation measures. At an intermediate scale are Lakewide Area Management Plans (LAMPS) for each of the five lakes (four of which straddle the international boundary), developed through lake-specific binational collaborations among federal, state or provincial, and local governmental agencies, as well as non-state parties. At the most localized scales, Remedial Action Plans (RAPs) have been developed for each of 43 designated priority "Areas of Concern," typically contaminated ports and estuaries contributing high levels of pollution loadings. RAPs are highly variable in their structures, processes, and policy approaches, but in most cases they are characterized by high levels of local public participation and multi-party collaboration among state and non-state actors.[46] Overseeing implementation is a Binational Executive Committee

43. Francis & Regier, *supra* note 39; at 274–75 Christie, *supra* note 39, at 141–42, 47–48; Regier, *supra* note 31; Susan M. McKenzie, *Toward Integrated Resource Management: Lessons About the Ecosystem Approach from the Laurentian Great Lakes*, 21 ENVTL. MGMT. 173 (1997).

44. Regier, *supra* note 31, at 141.

45. Regier, *supra* note 31, at 138; U.S. EPA Great Lakes National Program Office, Great Lakes Ecosystem Report, EPA-905-R-01-001 (2000), *available at* http://www.epa.gov/grt/lakes/rptcong2001.

46. McKenzie, *supra* note 43; Regier, *supra* note 31, at 138–40.

comprising U.S., Canadian, state, provincial, and tribal officials.[47] An EPA coordinating office, the Great Lakes National Program Office, was created in 1987, emulating the successful model of the Chesapeake Bay, with Environment Canada, the federal environmental protection agency, playing a cognate role on the Canadian side.[48] Significantly, however, while these federal agencies serve as central repositories of expertise and hubs of policy coordination, they do not claim exclusive competence or hierarchical authority over decision-making and problem-solving in the region. Tying together this sprawling polyarchic governance structure is a common core of information, data, and communication links provided by the Great Lakes Information Network, itself a binational public/private collaboration that pools the databases and information resources of dozens of governmental agencies and non-governmental entities throughout the region.[49]

The Great Lakes management effort thus rests on deep, ongoing, transboundary collaboration among state and non-state parties jointly committed to the co-management of a shared resource of critical importance to a region that extends across the territorial boundary. The institutional arrangements that jointly comprise the management regime extend well beyond the organs of the respective sovereign states to include a variety of sub-national and non-state actors, interacting through informal and sometimes even nominally extra-constitutional channels to effect governance in the void left by state incapacity. [50] As in the Chesapeake Bay, these efforts have a rolling, experimentalist flavor, as the parties continuously reassess and revise goals, objectives, and management measures in light of lessons learned, newly emerging science, and changing social, political, economic, and environmental conditions within the complex eco-region of the Great Lakes.

C. The Baltic Sea

The institutions that have emerged for collaborative management of the Baltic Sea are increasingly recognized as a model for other regional marine management efforts, including those sponsored by the United

47. U.S. EPA, *supra* note 15.
48. *Id.*
49. George Francis & Sally Lerner, *NGOs and Great Lakes Biodiversity Conservation, in* SAVING THE SEAS, (L. Anathea Brooks & Stacy D. VanDeveer eds., 1997).
50. Regier, *supra* note 31, at 139.

Nations Environment Programme's Regional Seas program.[51] The Baltic regime shares many important characteristics of the Chesapeake and Great Lakes efforts. The three programs are well aware of these similarities and endeavor to learn from each other through consultations and scientific and technical exchanges.[52] This constitutes a kind of horizontal networking and benchmarking of the best environmental management practices, in this case not at the state-to-state level but rather at the level of regional collaborative governance arrangements.

The Baltic Sea is the world's largest body of brackish water, functioning much like a large estuary with fresh water from its numerous tributary rivers mixing with a highly variable saline water inflow through the narrow straits separating the Baltic from the North Sea.[53] Its watershed encompasses some of the most intensive industrial, agricultural, and silvicultural production in Northern and Eastern Europe, resulting in severe toxic and conventional pollution, siltation, and eutrophication.[54] Complicating management efforts, the Baltic coast spans nine states with widely divergent environmental standards, economic conditions, political systems, and approaches to environmental protection.

The more environmentally minded of the Baltic coastal states recognized early on that protection of their marine waters would require transboundary cooperation within the region.[55] Indeed, some commentators have suggested that concern for the Baltic was a prime factor motivating Sweden to host the historic 1972 United Nations Stockholm Conference on the Environment, widely credited with ushering in the era of modern international environmental law.[56] By 1974, the seven then-extant Baltic

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51. UNEP, *Needs and Approaches to Improve Access to Environmental Information for Transboundary Decision-Making in the Baltic Sea Region*, UNEP/DEIA/MR, 1997.

52. *Id.*; U.S. EPA, The Great Lakes/Baltic Sea Partnership Program Framework Plan, *available at* http://www.epa.gov/grtlakes/baltic/plan.html.

53. Bengt-Owe Jansson & Harald Velner, *The Baltic: The Sea of Surprises*, *in* BARRIERS AND BRIDGES, *supra* note 32, at 298.

54. *Id.*; Rafal Serafin, & Jerzy Zaleski, *Baltic Europe: Environmental Management in Context*, *in* SAVING THE SEAS: VALUES, SCIENTISTS, AND INTERNATIONAL GOVERNANCE (L. Anathea Brooks & Stacey D. VanDeveer eds., 1997).

55. ROBERT G. DARST, SMOKESTACK DIPLOMACY: COOPERATION AND CONFLICT IN EAST-WEST ENVIRONMENTAL POLITICS 55–57 (2001) (stating that scientific consensus concerning the severity of the Baltic's environmental problems emerged in the late 1960s, and by the early 1970s, Western states had concluded that regional cooperation would be required to address them); Peter M. Haas, *Protecting the Baltic and North Seas*, *in* INSTITUTIONS FOR THE EARTH: SOURCES OF EFFECTIVE INTERNATIONAL ENVIRONMENTAL PROTECTION (Peter M. Haas et al. eds., 1993).

56. Robert W. Knecht, *Institutional Implications of Sustainable Development at the Regional Scale*, *in* REGIONAL SEAS: TOWARDS SUSTAINABLE DEVELOPMENT, (S. Belfiore et al. eds., 1996); *See also* Janson & Velner, *supra* note 53, at 303, 365–66 (describing the growing concern for environmental protection in Sweden in the 1950s and 1960s and the emergence of regional commitments to strengthen Baltic

states signed a framework Convention on the Protection of the Marine Environment in the Baltic Sea Area (Convention), which entered into force in 1980.[57] The Convention—the first multi-state regional agreement aimed at controlling and reducing pollution from land-based and airborne sources as well as ships[58]—created a permanent institutional apparatus centering on the Baltic Marine Environmental Commission, more commonly known as the Helsinki Commission or HELCOM. HELCOM was granted broad authority to collect, assess, and disseminate information on environmental conditions and on the implementation of the parties' commitments to monitor conditions, exchange data, and report on discharges, dumping, or spills occurring under their jurisdiction.[59]

HELCOM and its subsidiary working groups proceeded to produce a remarkable stream of detailed, quasi-legislative decisions and non-binding recommendations to member states on various aspects of marine environmental protection, including ship-based pollution, controls on toxic pollutants, and "best management practices" for agriculture and other land-based sources of marine pollution.[60] Although not legally binding, these recommendations were adopted by unanimous consent of the HELCOM parties and, like the Chesapeake Bay program's "directives," are regarded as morally, if not legally, binding. Like other "soft law" commitments, HELCOM recommendations have been judged to be quite influential in shaping parties' behavior.[61] Because of their relative informality, they have also proven to be generally easier to adopt, amend, and revise in light of new learning than formal treaty commitments.[62]

In other respects as well, the dynamic thrust of the Baltic regime comes from initiatives that lie outside formal international legal commitments. In 1988, Sweden convened a meeting of the environmental

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environmental protection at the 1972 Stockholm conference).

57. Convention on the Protection of the Marine Environment of the Baltic Sea Area, done at Helsinki, Mar. 22, 1974.

58. DARST, *supra* note 55, at 57.

59. Owen Greene, *Implementation Review and the Baltic Sea Regime, in* THE IMPLEMENTATION AND EFFECTIVENESS OF INTERNATIONAL ENVIRONMENTAL COMMITMENTS: THEORY AND PRACTICE 178–79 (David G. Victor et al. eds., 1998) [hereinafter IMPLEMENTATION AND EFFECTIVENESS].

60. *Id.*; DARST, *supra* note 55, at 64–65.

61. Alexei Roginko, *Domestic Implementation of Baltic Sea Pollution Commitments in Russia and the Baltic States, in* IMPLEMENTATION AND EFFECTIVENESS, *supra* note 59, at 575, 581.

62. *Id.*; *see also* ABRAHAM CHAYES & ANTONIA HANDLER CHAYES, THE NEW SOVEREIGNTY: COMPLIANCE WITH INTERNATIONAL REGULATORY AGREEMENTS (1995).

ministers of the Baltic states, who agreed to a (then) non-binding goal of fifty percent reductions in discharges of nutrients, heavy metals, and organic toxins by 1995[63]—a "soft law" commitment later formally incorporated into the revised 1992 treaty.[64] That same year, HELCOM granted observer status to NGOs, allowing them access to HELCOM documents and entitling them to participate in working group meetings on a non-voting basis. The inclusion of non-state voices and perspectives into the regional governance process lent transparency to its accomplishments and failures, created new channels through which substantive information might be conveyed to the regional public, and contributed to the growth of region-wide popular constituencies for environmental improvements.[65] Active non-governmental participants include national, regional, and global environmental NGOs, regional associations of ports and municipalities, industry groups, and independent scientific societies like the Baltic Marine Biologists, the Conference of Baltic Oceanographers, and the Conference of Baltic Hydrologists. NGO representatives frequently serve on governmental boards in the various member states and participate in region-wide management institutions.[66] IGOs and NGOs have also undertaken significant implementation responsibilities, especially in providing financial and technical assistance to remediation projects and monitoring their implementation.

In 1990, the heads of government of the Baltic states, together with Norway, Czechoslovakia, and the European Commission (EC), issued the Baltic Sea Declaration on Environment, calling for a reorientation of environmental measures from conventional "end-of-pipe" pollution control strategies toward ecological restoration of the Baltic marine environment. This new ecosystem orientation was to be coupled with an emphasis on reducing pollution at the source through "cleaner technologies, including low-waste and non-waste processes and environmentally non-

63. *See* DARST, *supra* note 55, at 64. A recent summary report prepared by the Finnish Environment Institute concluded that most Baltic states had met the 50% reduction goal for phosphorus loadings from point sources, while achieving smaller reductions for nitrogen loadings from point sources and mixed results for non-point sources. The Finnish Environment Institute, *Evaluation of the Implementation of the 1988 Ministerial Declaration Regarding Nutrient Load Reductions in the Baltic Sea Catchment Area 62*, THE FINNISH ENVIRONMENT 524 (2002).

64. Compare Declaration on the Protection of the Marine Environment of the Baltic Sea Area, adopted on 15 February 1988 in Helsinki by the Ministers Responsible for Environmental Protection in the Baltic Sea States (declaring "firm determination" to reduce nutrients by 50%), with Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992, Art. 5 (undertaking binding commitment to prevent and eliminate pollution from all sources); *id.* at Art. 6 (undertaking binding commitment to achieve pollution reduction by using Best Environmental Practices for all sources and Best Available Technology for point sources).

65. UNEP, *supra* note 51, at 14–22.

66. Jansson & Velner, *supra* note 53, at 307, 334.

hazardous products." The Ministers also created a Baltic Task Force (later the Program Implementation Task Force) consisting of HELCOM members, Czechoslovakia, Norway, the EC, the European Bank for Reconstruction and Development, the European Investment Bank, the Nordic Investment Bank, and the World Bank. The function of the Task Force was to identify and develop cost-effective investment projects throughout the region that will reduce pollution, focusing especially on pollution "hot spots" in the financially strapped states of the former Soviet bloc.[67] This innovative regional cross-subsidy approach emerged when the Nordic countries, which had already substantially reduced pollution, recognized that further domestic pollution control measures would be costly and that more cost-effective opportunities for pollution reduction lay in Eastern Europe and the former Soviet Union.[68] Adapting a strategy pioneered in the Great Lakes, regional institutions have identified some 132 pollution "hot spots," most (but not all) of them in Eastern Europe and the former Soviet Union. Remediation of these "hot spots" is carried out with technical assistance from program partners and financial assistance provided by a consortia of development banks and bilateral assistance programs.[69] These efforts thus link regional and local scales, subtly bypassing the conventional claim of sovereign states to exclusive competence to manage environmental problems within their territorial boundaries.

Simultaneously, the Baltic process has launched a region-wide program to designate "green spots," an interlinked network of protected areas. At intermediate regional scales, effective transboundary collaborations have been established between Finland, Russia, and Estonia, with respect to

67. Roginko, *supra* note 61; Jansson & Velner, *supra* note 53, at 344.

68. Roginko, *supra* note 61; DARST, *supra* note 55, at 70–71 (stating that because environmental standards in Western states were already high, "each effort to wring additional [pollution] reductions from domestic sources brought progressively diminishing marginal returns," making Western states "increasingly self-interested in bringing about reduced discharges in Eastern states" where the same environmental gains could be purchased at lower cost). In some cases marginal pollution control efforts in the Nordic states may be ten times more costly than in the East. *See, e.g.*, Mikko Kiirikki et al., *3D Ecosystem Models as Decision Support Tools in the Gulf of Finland—The Kotka Archipelago as an Example*, *in* BALTIC COASTAL ECOSYSTEMS: STRUCTURE, FUNCTION AND COASTAL ZONE MANAGEMENT [hereinafter BALTIC COASTAL ECOSYSTEMS] 293, 307 (Gerald Schernewski & Ulrich Schiewer eds., 2002) (stating that nutrient load reduction efforts in the St. Petersburg region of Russia are more than ten times more cost-effective than marginal pollution control costs in Finnish waters, though the latter must also be carried out because they affect nearshore waters).

69. Serafin & Zalesi, *supra* note 54, at 345; Greene, *supra* note 59.

the Gulf of Finland,[70] and between Sweden and Finland, with respect to the Gulf of Bothnia.[71] The program thus reflects a multi-tiered "nested" management architecture closely resembling those found in the Chesapeake and Great Lakes regions.

In 1992, all nine Baltic states and the European Community codified these various commitments in a new Helsinki Convention,[72] calling for the restoration of the Baltic Sea ecosystem through concerted action throughout the watershed, extending to territorial seas, internal waters, and inshore land-based sources,[73] through efforts consistent with a Joint Comprehensive Environmental Action Program to be periodically revised and updated in collaboration with the development banks already participating in the task force.[74] The experimentalist flavor of the new convention is reflected in its charge to the Program Implementation Task Force to "prepare and undertake a practical rolling work [program], with measurable goals and targets" and to "periodically review and propose updating of the [program], taking into account technological and economic developments as well as changes in the environmental status of the Baltic Sea."[75]

More recently, under the rubric of "Visions and Strategies around the Baltic Sea Region," a parallel ministerial process has emerged to coordinate land use planning and sustainable economic development efforts in the region, consistent with HELCOM's broad ecological restoration goals.[76]

Like the Chesapeake Bay and Great Lakes programs, the Baltic regime views joint monitoring of environmental conditions and stressors as an essential foundation for policy development, periodic reassessment, and adaptive adjustment. Reporting requirements, monitoring protocols,

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70. *See* DARST, *supra* note 55, at 80–83 (detailing Finnish-Estonian cooperation); Jansson & Velner, *supra* note 53, at 344.

71. Jansson & Velner, *supra* note 53, at 403.

72. Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992, done at Helsinki, Apr. 9, 1992 (entered into force Jan. 7, 2000).

73. *See id.*, Art. 4 (obligating each party to implement the convention within its territorial sea and internal waters) & Art. 6 (extending obligation to prevent and eliminate land-based marine pollution to all point and non-point sources within the entire catchment area of the Baltic). *See also* DARST, *supra* note 55, at 73–74 (stating that the 1992 Convention brought the internal waters of contracting parties within its jurisdiction and obligated parties to take specific measures to combat land-based pollution).

74. They are the Council of Europe Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Nordic Investment Bank, the Nordic Environment Finance Corporation, and the World Bank.

75. Terms of Reference for the Programme Implementation Task Force, HELCOM PITF 16/2000, Annex 4.

76. *See* Andreas Kannen, *Integrated Coastal Zone Management (ICZM) in the Context of Spatial Planning*, *in* BALTIC COASTAL ECOSYSTEMS, *supra* note 68, at 193, 200–01.

and assessment capacity have been periodically revised and strengthened, building regional capacity to generate and adjust to new information on ecological conditions.[77] Monitoring of physical, chemical, and biological variables of the open sea started in 1979, but until 1992, monitoring of coastal waters was considered a national responsibility and only summary assessments were required to be reported. Under the revised 1992 Convention, however, states are obligated to monitor coastal waters and report directly to the Commission. The 1992 Convention also calls for monitoring in designated Baltic Sea Protected Areas. In 1992, the Environment Committee decided to integrate these disparate monitoring programs into a common structure, designated "Cooperative Monitoring in the Baltic Marine Environment," which now coordinates monitoring region-wide under uniform monitoring protocols and data standards. Initiatives have also been undertaken to improve transparency, communication, access to information, and effective decision-making on a regional scale through web-based information systems like BALLERINA, which pools the data and information resources of a variety of state and non-state actors like the model established by the Great Lakes Information Network.[78]

By most accounts, the Baltic regime has been reasonably effective in addressing land-based pollution and significant progress is indicated in many other areas.[79] Although nitrate levels and overall eutrophication have not improved, phosphorus concentrations have decreased significantly[80] and nitrogen loadings from point sources have declined sharply.[81] Concentrations of organochlorine compounds have decreased throughout the region, bringing corresponding improvements to populations of marine mammals and sea birds,[82] and twenty-six priority pesticides have

77. Greene, *supra* note 59, at 192–95.

78. UNEP, *supra* note 51, at 15; *see also* Irene Lucius, *Developing Efficient Information Provision Tools for ICM Practitioners in the Baltic*, *in* BALTIC COASTAL ECOSYSTEMS, *supra* note 68, at 321, 324–26 (detailing a series of web-based information and decision support tools now under development in the region, which integrate and disseminate information on eutrophication and other key environmental quality indicators, as well as meteorological, oceanographic, hydrological, biological, and land cover data).

79. *See generally* Haas, *supra* note 55, at 170–77; UNEP, *supra* note 51.

80. Baltic Marine Environment Protection Commission, Environment of the Baltic Sea Area 1994–1998, Baltic Sea Environment Proceedings No. 82A (2001), at 5.

81. Finnish Environment Institute, *supra* note 63, at 4.

82. *Id.* at 10–11, 15.

been eliminated completely.[83] Indeed, HELCOM has been criticized in some quarters for placing too heavy an emphasis on environmental protection at the expense of competing economic needs and uses of the Baltic Sea.[84]

More than any other international marine management effort, the Baltic regime exhibits the collaborative, experimentalist, and polyarchic flavor that I have characterized here as post-sovereign governance. It operates at regional transboundary scales, extending its reach even to joint analysis and management of environmental problems within the territorial seas, internal waters, and land-based activities deep within the interior reaches of participating states to the extent they affect the quality of the marine environment, thus piercing the myth of exclusive sovereign competency to control activities within a state's territorial jurisdiction.[85] It adopts an ecosystem-oriented, holistic, integrated approach to environmental management, and as a necessary corollary, it is self-consciously experimentalist and adaptive, operating through the progressive and iterative articulation, reassessment, and readjustment of goals and policy responses as scientific understanding deepens and monitoring data produce new information.[86] Like the Chesapeake Bay and Great Lakes programs with which it has established fraternal relations, the Baltic Sea program increasingly involves deep transnational collaboration, not only among sovereign states and their subsidiary organs, but also among subnational governments, industry groups, environmental and other NGOs, scientific societies, IGOs, and other non-state parties throughout the Baltic basin in a joint exercise in eco-regional environmental governance.[87]

VI. TOWARD A GLOBAL SUPPORT STRUCTURE FOR "POST-SOVEREIGN" ARRANGEMENTS

These cases place several large eco-regions, jointly encompassing a non-trivial share of the planet's vital environmental resources, under collaborative and experimentalist governance arrangements of the type that I have described as "post-sovereign" governance. Each of the cases cited here has been widely hailed in policy circles as an innovative and

83. *Getting Rid of Hazardous Substances by 2020*, HELCOM NEWS, Jan. 2002, at 4.

84. *See, e.g.*, F. Rijsberman, The *Effectiveness of the Helsinki Convention as a Tool for Integrated Coastal Resources Management of the Baltic Sea, in OECD Documents, Coastal Zone Management* 285, 297–98 (OECD Environment Directorate, 1990).

85. *See* DARST, *supra* note 55, at 74 (stating that both planning and implementation of the JCP are considered joint activities, carried out by PITF members and independent consultants).

86. *See* Jansson & Velner, *supra* note 53.

87. *Id.*

successful model, to be studied and emulated by those seeking to manage other marine (Baltic), estuarine (Chesapeake Bay), or freshwater aquatic (Great Lakes) resources. This suggests that the influence of this model might eventually extend well beyond these regions. Thus far, all the cases have a distinctly regional character.

What does this model tell us about global decision-making and global environmental governance? Given the apparent successes of each of the regimes examined here, global policy-makers might consider whether some seemingly global environmental problems might better lend themselves to regional solutions, on the theory that effective inter-sovereign and state/non-state problem-solving collaborations of the kinds described here might be more readily obtained at eco-regional scales. For example, the conservation of biodiversity might better be understood not as a single overarching global problem requiring uniform global rules and approaches, but rather as a series of thematically linked local and regional ecosystem-scale problems, ultimately requiring local and regional solutions and replicable regional governance models. Thus, for example, we might fruitfully divide the problem of biodiversity conservation into such thematic categories as protection of tropical rainforests, temperate rainforests, boreal forests, mangrove forests, large estuaries, large marine ecosystems, and so forth, and then look to experiment with, evaluate, and replicate collaborative regional governance models within each of those thematic categories. Indeed, it appears that the Biodiversity Convention and its subsidiary bodies and affiliated NGOs and IGOs are already beginning to make some conceptual progress in that direction, although on-the-ground implementation lags. This, in turn, begins to suggest a revised role for global agreements and global institutions—to spawn and support regional governance processes that place the effective locus of governance at the appropriate eco-regional scale, while nesting such regional efforts within some larger set of global institutions that can monitor the various regional governance mechanisms, provide technical assistance, identify and diffuse best practices, and so forth. The role of global agreements and institutions thus would shift from one of imposing fixed rules and standard approaches to one of supporting adaptive ecosystem management at ecologically appropriate scales.

Similarly, many problems of the marine environment, and virtually all problems involving freshwater aquatic systems, can be understood as primarily local or regional in character. Rather than awaiting the

emergence of global rules concerning land-based marine pollution, for example, we might begin to address these problems at eco-regional levels and then seek to bootstrap success in some path-breaking regions (such as the Chesapeake Bay or the Baltic Sea) into a coordinated global network of regional efforts, one that revolves around a central capacity to monitor regional projects and to benchmark, evaluate, and diffuse best practices and new learning. Regional approaches also increasingly inform fisheries management, especially under the new Straddling Stocks Convention, and opportunities might emerge for horizontal benchmarking and diffusion of successful strategies and approaches in that context as well. In general, however, such regional efforts thus far have taken a backseat on the international environmental policy agenda to high-profile global issues and rule-based approaches, where progress generally has been more difficult to achieve.

In the Chesapeake Bay, Great Lakes, and Baltic Sea programs, sovereign states are neither the sole authors nor merely the implementers of the rules; they are co-authors in an ongoing multi-party governance process that at least partially reflects the characteristics of "post-sovereign" governance.