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Environmental Governance on the 49th Parallel: New Century, New Approaches

THIS PUBLICATION contains twelve papers exploring the issues and themes that emerged from a two-day conference on Transboundary Environmental Governance in Canada and the United States, held at the Woodrow Wilson International Center for Scholars on May 8 and 9, 2008, and organized by the Canada Institute. The conference aimed to provide participants with a better understanding of the varied institutional arrangements that make up environmental cross-border governance between Canada and the United States, and determine whether these arrangements have had a substantive impact on the bilateral environmental relationship.

Much of the discussion throughout the conference focused on the relevance and impact of the International Joint Commission (IJC) on bilateral environmental issues. Through the Boundary Waters Treaty of 1909, the International Joint Commission was granted a broad range of powers by the Canadian and United States governments to jointly manage transboundary water resources. The IJC's institutional structure—allowing equal representation from both countries and a commitment to binational consensus in its decision making—has been heralded as a model for building international cooperation.

Yet new and emerging environmental developments, particularly the threat of climate change, underscore the urgent need to assess the ability of existing North American institutions to cope. As several authors in this publication highlight, while the IJC remains central to any examination of cross-border environmental governance, it is by no means the only institution that needs to be considered when contemplating an effective response.

Enhancing cross-border environmental governance requires an understanding not only of future environmental issues, but also a firm grasp of the history of environmental cooperation between Canada and the United States, as well as the multitude of institutions and policy arrangements that have emerged at the national and subnational levels of government in both countries since the estab-

lishment of the IJC. The authors in this publication lend their considerable expertise and insight in each of these areas, while offering guidance on how best to mount an effective response to the unprecedented environmental challenges facing Canada and the United States in this new century.

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ENVIRONMENTAL GOVERNANCE ON THE 49TH PARALLEL: NEW CENTURY, NEW APPROACHES

Chapter 1: Trans-border Environmental Governance in Canada and the United States: Introduction and Common Themes

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The International Joint Commission (IJC), whose centennial is celebrated by this volume, was a bold experiment when it rose upon the international scene 100 years ago. It evolved to become a major player in a number of environmental concerns and serves as an important test of concept, i.e., can a binational commission guided by political appointees and possessing few formal powers be truly effective? The answer is both yes and no. The following chapters explore IJC performance, but also examine an array of alternative mechanisms, including a growing phalanx of subnational cross-border institutions and governance arrangements, that are responding to new environmental challenges. This introductory chapter explores the concept of issue framing and its effects on forms and processes of governance. Another recurring theme in the chapters ahead, and discussed at length in this introduction, is the relative effectiveness of "hard" versus "soft" law in effecting change to promote environmental sustainability, mitigate climate effects, and—specific to the IJC's original role—manage water resources shared by U.S. and Canadian jurisdictions. "Hard law" tends to entail a centralized regulatory response to new environmental problems or perceived failures by existing institutions. In contrast, soft law tends to involve less formal and authoritative arrangements in favor of policy networks sustained through epistemic communities and relying on cooperation and shared scientific and technologic expertise, rather than coercion, as a means to an end. National, regional and historic differences in approach—and their relative effectiveness—are explored in subsequent chapters.

The odyssey of shared environmental governance involving Canada and the United States was launched one century ago, with the establishment of the 1909 Boundary Waters Treaty. This deal was struck at a point at which initial proponents at the highest levels of their respective governments were nearing the end of their careers in elective politics. Theodore Roosevelt was entering the final year of his presidency, followed by an unsuccessful effort to reclaim the Oval Office in 1912. Wilfrid Laurier was serving in his 13th year as prime minister in 1909, but would never regain power after a 1911 election in which his support for expanded "reciprocity" with the United States cost him dearly.

Implementation of the treaty and the management of its enduring institution, the International Joint Commission (IJC), would be left to succeeding federal leaders. The Commission, as we shall see in many subsequent chapters, has been a major player in a number of environmental concerns spanning multiple generations. It constitutes an

important test of the effectiveness of a binational commission guided by political appointees, but one that possesses few formal powers and so has to rely on powers of suasion if it is to have influence. But while the Boundary Water Treaty specified initial Commission duties and responsibility for "all such questions as may hereafter arise," it has become increasingly clear in recent decades that many "such questions" have begun to be addressed, not by the IJC, but rather by an incredibly diverse patchwork quilt of other institutions and policy frameworks.

The very issue of "Canadian-American environmental governance" reflects not one single treaty or institution but rather a loosely-structured experiment with numerable players that represent virtually every model of governance imaginable. This includes new institutions established through binational (or in some instances, continental via Mexican input) negotiation, formal regional arrangements that address some specified portion of the border region, and loose confederations of neighboring states and provinces. Some of these efforts are focused on a particular ecosystem, such as the Great Lakes Basin, whereas others entail *ad hoc* partnerships among neighboring jurisdictions that happen to straddle a national border that stretches for nearly 4,000 miles or 2,485 kilometers and expands nearly 50 percent further if the Alaskan-Canada border is included. Our timeline (see Table 1.1) of cross-border environmental governance in Canada and the United States illustrates a subset of major policy developments over the past century. This serves to underscore the diverse tapestry of institutions and arrangements that have come collectively to comprise this area of governance, demonstrating the continued presence of the International Joint Commission but also illustrating that it is only one player in a very crowded system with ever-shifting boundaries and uncertain effectiveness.

We concluded two years ago that the time was long overdue to launch a comprehensive overview of this governance structure, both to look back at past experience but also to look forward to a new century and consider ways to best respond to enduring or looming environmental challenges. Are the Boundary Waters Treaty and the IJC still the gold standard, a proven success story that could continue to evolve into a central role in governance? Or are they increasingly marginalized by their limited authority and the emergence of new issues and alternative governance arrangements? What about the ever-expanding tapestry of competing institutions and agreements? Is there evidence to suggest that one or more of these is particularly effective or do they simply carve up convenient turf to maintain institutional comity while doing little for environmental protection? Is it even possible to conceive of serious cross-border engagement and collaboration, given the historic tensions and asymmetries between these neighboring nations that share a profoundly long border?

We remain struck by how few serious attempts have been made to answer these questions. Indeed, much of the existing scholarly literature on cross-border environmental policy involving Canada and the United States focuses on just one institution, region or governance arrangement and tends to be rather dated (IJC 1975; Caldwell 1988). Much of the more recent analysis features internal self-assessment by officials serving these institutions, offering important insider accounts from individuals directly involved in policy development, but inherently limited by the challenge any participant-observer faces in offering dispassionate analysis (Durnil 1995; Hartig and Zarull 1992). An even more glaring shortcoming is the absence of any volume that attempts to examine this arena of governance in a comprehensive way, looking across multiple areas of environmental concern and examining multiple institutions that have sprung up over past decades to respond to some portion of that concern.

Consequently, we rapidly shelved initial plans to focus exclusively on one institution, even one as prominent as the IJC. We applaud the decision of the current commissioners to move forward with their own historic analysis of the IJC. This volume has considerable "IJC content," but also examines an array of alternative institutions and governance arrangements. In turn, it will also highlight a number of issues rapidly gaining saliency in both nations, such as climate change and renewable energy, and begin to consider the preparedness of the existing phalanx of institutions to forge a viable response to new environmental challenges. Collectively, these chapters offer considerable historic insight into how we arrived at our current state of affairs, substantial analysis into the results of this remarkable body of governance activity, and some preliminary thoughts about possible lessons from this as we begin to look ahead and contemplate future environmental challenges and governance needs across this long and important border.

Steve Brooks and I subsequently decided to assemble an A-List team of scholars to tackle this challenge and

Table 1.1: Timeline of Major Development in Cross-Border Environmental Governance in Canada and the United States

1900s	*1909*	Boundary Waters Treaty and creation of International Joint Commission
1910s	*1918*	IJC Ambitious Transnational Regime
1920s	*1921*	IJC Provisional Order on Water Apportionment
1930s/1940s		
1950s	*1955*	Convention on Great Lakes Fishers and creation of Great Lakes Fisheries Commission
	1955	Interstate compact and creation of Great Lakes Commission
	1958	International Souris River Board of Control
1960s	*1964*	Columbia River Treaty
	1968	North American Electricity Reliability Council
1970s	*1972*	Great Lakes Water Quality Agreement
	1973	Conference of New England Governors and Eastern Canadian Premiers
	1978	Great Lakes Water Quality Agreement amended
	1978	Northeast International Committee on Energy
1980s	*1983*	Great Lakes Council
	1984	Skagit River Treaty
	1985	Great Lakes Charter
	1985	Canada-U.S. Pacific Salmon Treaty
	1987	Great Lakes Water Quality Agreement amendment and Remedial Action Plans
1990s	*1992*	British Columbia-Washington Environmental Cooperation Agreement
	1994	Commission on Environmental Cooperation in North America
	1997	Great Lakes Bi-National Toxics Strategy
	1998	Georgia Basin Ecosystem Initiative
2000s	*2001*	Great Lakes Charter Annex
	2004	Great Lakes Regional Collaboration
	2005	Great Lakes-St. Lawrence Basin Sustainable Water Resources Agreement
	2007	Western Climate Initiative
	2007	Security and Prosperity Partnership of North America

attempt to prepare an edited volume that would address many of these environmental governance questions. We sought partners who could provide essential funding and a forum for a conference to allow serious exchanges between scholars and policy makers free of any pressures or expectations to pre-judge conclusions. So we remain honored by the opportunity to work closely with colleagues at the Woodrow Wilson International Center for Scholars, particularly Canada Institute Director David Biette and his colleagues Kristopher Carr and Kenneth Crist. We remain equally honored by the collaboration we have received from the Academic Relations Office of the Canadian Embassy, particularly Director Daniel Abele and colleagues in the Detroit Consulate General Office such as Dennis Moore. These partnerships made it possible for us to recruit all of the top-level scholars whose work appears in this volume and present initial versions of these papers in May 2008 at a Wilson Center conference on Trans-Boundary Environmental Governance in Canada and the United States. The exchanges at that gathering, both between scholars but also through unexpected active participation and engagement by senior policy makers from both nations, convinced us to move this collection of conference papers into this publication

It is our hope that this volume not only provides a broad overview of existing institutions and policies, but also begins to respond to some of the fundamental

questions noted above. It is not our intent to use these chapters to try to prove or disprove one overarching body of theory that can purport to explain all aspects of cross-border environmental governance. Our concerns include policy formation but place a particularly strong emphasis on policy implementation and, ultimately, effectiveness, as measured in improved environmental quality. We believe that these chapters offer important insight into some basic governance questions that are relevant to Canadian-American cross-border environmental governance and can more generally be extended to address other efforts to promote environmental protection across extended boundaries that blend national and subnational governing institutions. Each of the chapters is intended to respond, with varying degrees of emphasis, to seven broad governance issues which are introduced in subsequent sections.

FRAMING OF GOVERNANCES

Environmental concerns present important challenges in issue framing, namely the way in which political actors and the citizenry have come to characterize or define the issue at hand. Indeed, framing may have direct and extensive influence on the kinds of policy options and tools selected (or avoided), even outlining the boundaries of what is and is not politically and administratively feasible. As Robert Axelrod and Scott Atran have demonstrated in the context of Middle Eastern relations, issue framing varies enormously across various political boundaries and working toward more common framing could lead to significant improvements in relations (Axelrod and Atran 2008).

Environmental issues are often framed in response to particular conflicts or disasters, illustrated by the experiences in many chapters in this volume. From cross-border river disputes that framed the case for creation of the Boundary Waters Treaty and the International Joint Commission to more recent experiences with water contamination in Ontario and Wisconsin, specific events can shape the way an issue is defined and be highly influential in subsequent policy development. In turn, other issues may take much longer to come into focus, perhaps with competing frames offering different characterizations of what is involved (Pralle 2006).

In our chapters, we see that cross-border environmental issues are indeed framed in very different ways, often leading to very different kinds of policy responses and institutional development. A number of our authors reveal that institutions and policies have been established to respond to multiple frames, often operating within the same institutional framework. In Donald Alper's examination of environmental governance in the Pacific West, a blend of institutions are forced to confront fisheries, forests, mining, air quality, recreation and tourism, water quality, hydro-based electricity and other alternative energy sources, hazardous waste and, increasingly, climate change. Mark Sproule-Jones reviews the process of developing Remedial Action Plans (RAPs) for the 43 most damaged zones of the Great Lakes Basin under the auspices of the International Joint Commission but reliant upon localized institutions to pursue remediation of these "areas of concern." He finds that RAPs often have had to address simultaneously such issues as ecological health, human health, habitat protection, human use of resources, and economic development. Philippe LePrestre's analysis of Quebec's unique approach to water governance, seemingly fueled more by symbolic politics and opportunities to promote national identity than environmental protection, blends issues such as hydroelectricity development and expansion with water quality protection, water diversion mitigation, and erosion control, among other issues, under overlapping governance umbrellas. All of these may be worthy goals but many of them may literally collide and conflict with one another, requiring a blend of analytical sophistication and political and managerial savvy that are not always evident in the analyses that emerge from these chapters.

In many chapters, economic development and protection of a particular resource has surfaced as a primary concern, with subsequent policy geared to promote and protect that resource, yet often producing uncertain outcomes for environmental protection. Other cases offer different frames, such as concern over environmental quality and possible impact on human health. Still other

> Development and protection of a particular resource has surfaced as a primary concern... often producing uncertain outcomes for environmental protection.

cases are framed primarily as matters of ecosystem restoration or management. For newer issues, such as climate change and promotion of renewable energy, competing frames are clearly in play, several of which overlap the kinds of characterizations noted above. If a region of Canada and the United States, for example, attempts to develop a carbon cap-and-trade system, is that motivated by a desire to reduce greenhouse gas emissions, prod federal institutions to emulate their behavior, or gain economic and strategic advantage in preparing for a carbon-constrained economy? How might the selection of the frames used to secure political support for policy development influence the design of core elements of such an emissions trading regime? Barry Rabe's analysis explores these competing frames and examines both subfederal-level policy innovation and prospects for future cross-border collaboration in this arena. Ian Rowlands finds some overlapping themes in his analysis of renewable energy development.

The selection of one or more frames may well influence the direction and even design of policy, as well as determine whether there is sufficient support for enactment and implementation. This is inextricably interwoven with the question of ideas in policy development, both in guiding the selection of issue frames and the institutions and policy tools that will be employed in response. Many of our chapters introduce different perspectives on the framing of various issues, in some cases demonstrating changes in framing that take place over time. This is perhaps most notable in those chapters that examine the century-long odyssey of the International Joint Commission from an initial focus on river-boundary disputes toward many other areas, including toxic pollution in water bodies. These chapters raise important questions about the capacity of established institutions to adapt to new realities and challenges, both in adopting new frames for new times as well as responding institutionally in effective ways to changing sets of environmental challenges. William Lowry's examination of river restoration via dam removal demonstrates dramatic differences between American and Canadian policy approaches, suggesting different national patterns of framing and attendant policy development that can complicate shared management of rivers that cross the 49th parallel. Other chapters also highlight Canadian vs. American framing differences of this sort that further complicate the challenge of establishing governance that is not only collaborative but also effective.

FORM OF GOVERNANCE

The "hard" vs. "soft" law debate is central to any issue of environmental governance, and particularly ones involving multiple nations. Many scholars have attempted to define these distinctions. Hard law commonly implies a high degree of formality in defining policies and outlining mechanisms to assure their implementation (Weiss and Jacobson 1998; Young 1999). Hard law often takes the form of command-and-control policy that is then delegated to executive agencies to oversee and impose penalties or sanctions in the event of non-compliance, such as the 1990 American Clean Air Act and other medium-based regulatory policies. Internationally, hard law examples in environmental protection may be somewhat difficult to find as nations are reluctant to yield sovereignty, though notable exceptions have included the various iterations of an international accord to phase out the use of chemicals that deplete the ozone layer (Hammitt 2004).

Calls for new forms of hard law are often issued in response to recognition of new environmental problems or perceived failures by existing institutions. This periodically leads to recommendations to establish major new international institutions that can work across multiple environmental policy arenas, such as a 2006 proposal to create a World Environmental Organization with broad authority (Speth and Haas 2006).

Soft law, in contrast, tends to involve less formal and authoritative arrangements, often through the working of policy networks that rely on cooperation rather than coercion. Many of these networks are sustained through so-called "epistemic communities," bodies of policy professionals who tend to work without much public notoriety but retain considerable expertise in a given area and work to share information and forge collaborative strategies (Haas 1990; Montpetit 2003). Much recent work on "common pool resources" has advanced the case that hard law arrangements may not be necessary across multiple jurisdictions and can even damage potential for more collaborative initiatives that reflect localized expertise and willingness to establish shared governing norms (Ostrom 1990; Cass 2006). In turn, considerable work in the area of sustainable development and sustainable communities has focused on the promise of governance arrangements that both cross jurisdictional boundaries and utilize tools more associated with soft law (Mazmanian and Kraft 2009). There is considerable evidence that soft law, broadly defined, has received an increasingly warm embrace in many scholarly and policy-making corners in recent decades, at least in part in reaction to perceived shortcomings to hard law approaches to environmental governance.

The Canadian and American cross-border system of environmental governance in many respects constitutes a test of the efficacy of many forms of soft law governance, whether binational or regional in scope. Even an institution such as the IJC epitomizes a soft law approach in nearly every arena in which it is involved. Forged through a binational treaty and guided by commissioners appointed at the prime ministerial and presidential levels, it outwardly possesses some of the qualities of hard law. But, in most respects, the IJC represents an ongoing experiment in soft law, as its primary tools include gathering and disseminating information to influence respective national governments to take action. Even those IJC initiatives that seem to have a harder dimension, such as Remedial Action Plans (RAPs), rely almost exclusively on moral suasion from constituents that are influential in each designated Area of Concern. The IJC has few funds of its own to facilitate implementation and lacks any capacity to mandate any allocation of resources by various federal and subfederal-level governments to these local remediation efforts. Instead, the primary policy outputs of the IJC involve broad policy statements and reports, many of which have "hortatory" qualities and will be influential only if they persuade national and sub-national governments and the private sector to respond (Gormley 1989).

At the same time, the IJC has very limited capacity to initiate new policies or emphases. As noted during our conference by Commissioner and former North Dakota Governor Allan Olson, "the governments [of Canada and the United States] would have to ask" before the IJC could undertake any serious effort to link mounting concerns over homeland and border security with environmental issues such as the safety of dams, bridges, and power plants where cross-border concerns have arisen. On climate change, the IJC is largely confined to limited study of the issue and periodic declaration that it could constitute a serious environmental problem for both Canada and the United States. Several chapters in this volume raise questions about the impact and effectiveness of IJC governance, despite its lengthy history and continuing visibility as the flagship institution on trans-border environmental concerns involving these two nations.

The IJC is not alone in this regard, however. Nearly all of the other cross-border environmental governance arrangements examined in this volume employ some version of a soft law approach that relies on multi-unit networks and collaboration rather than formal regulation and enforcement capacity. This emerges as a common pattern among the many cross-border governance arrangements that involve some coalition between states, provinces and regions, as reflected in many of the chapters. One notable "success story" in these chapters is the analysis of the Great Lakes Fisheries Commission provided by Marc Gaden and Charles Krueger. In this instance, it is clear that a series of interwoven networks has followed a soft law path and produced a stable regime that can demonstrate considerable success in protection of key species. This approach appears to be sufficiently flexible to allow for varied responses to particular challenges in individual lakes. Mark Sproule-Jones demonstrates a somewhat similar pattern in long-

term efforts to reduce the threat to Great Lakes fish by an invasive species, the sea lamprey. But these cases remain largely exceptional among our chapters, as we shall discuss further. Collectively, this body of cross-border policy raises some sobering questions concerning the efficacy of soft-law approaches, despite the growing chorus of scholars and activists who have endorsed such a direction.

PROCESS OF GOVERNANCE

A fundamental question in environmental governance experiments around the world involves the extent to which they are driven by elected officials and their appointees or policy professionals who gain authority through expertise and enjoy some degree of independence from the political process. Invariably, this raises questions of principal-agency, beginning with an obvious distinction whereby all Canadian environment and natural resource ministers (both federal and provincial) are elected members of their respective legislatures, whereas their American counterparts are political appointees and at least some states go to considerable length to isolate their lead agencies from direct political influence. In the case of energy policy examined by Ian Rowlands, for example, all provinces have ministries headed by elected officials whereas many states maintain a form of commission governance that expressly limits the powers of governors and legislators.

Cross-border environmental governance employs a range of leadership mechanisms. The IJC model is dominated by commissioners who tend to have considerable experience in elective politics or very close ties to various prime ministers and presidents. In contrast, many other governance arrangements described in these chapters are clearly more "staff-driven." State and provincial arrangements run the gamut in this regard; some are heavily influenced by formal engagement between elected premiers and governors whereas others are largely the working of mezzo-level agency officials who find common cause and carve out areas where they exercise considerable influence (Carpenter 2001; Rabe 2004).

Crossing national boundaries, "trans-governmental networks" have emerged in many contexts, allowing for direct collaboration between officials who hold common positions in agencies and ministries in neighboring jurisdictions (Slaughter 2004). One recent illustration of this involves senior bureaucrats in Canada, the United States and Mexico who comprise specialized committees of the Security and Prosperity Partnership of North America that was launched in 2007 and retain some authority to engage in environmental, natural resource, and energy arenas (Craik and DiMento 2008). Is it possible to derive any lessons from these competing governance approaches and begin to distill the most effective roles for elected officials as opposed to agency experts?

Political influence over agency staff is most evident in the case of the International Joint Commission. As Stephen Brooks' chapter demonstrates, politics is never far from the surface of IJC deliberations and indeed a great many commissioners are former elected officials, likely with strong partisan ties to the presidents and prime ministers who have appointed them. The 2008 controversy surrounding the unceremonious ouster of American Commissioner Dennis Schornack by the Bush Administration underscores the enduring political tension facing commissioners when they wade into politically-sensitive areas. In turn, there is little evidence that commissioners have been able to use their political connections for leverage, whether securing resources from federal authorities or prodding subfederal or regional entities into action. Political officials are not absent in the other cases but most other chapters appear to allow more autonomy to policy professionals, either working internally or in some collaboration with other institutions.

In some instances, it is clear that agency officials use their latitude to foster innovation, again perhaps most evident in Marc Gaden's discussion of fisheries governance. But capacity or willingness to use such authority is not consistent across cases, particularly among Canadian provinces. Indeed, one theme that emerges across several chapters is the penchant for provinces to lag behind state counterparts in policy innovation and development. This raises important questions concerning differing sub-national capacity and commitment, especially given themes identified in chapters by Debora Van Nijnatten and Donald Alper whereby clusters of

provinces and states assume ever-expanding roles in various regions that straddle portions of the national border. As VanNijnatten stated at the Wilson Center conference, "American states tend to push provinces to do things; there is a northward pressure."

The issue of possible Canadian status as a laggard in cross-border environmental relations has surfaced previously (Boyd 2003; Rabe 1999) but recurs with some frequency in these chapters. In Lowry's analysis of river restoration policy, for example, Canadian provincial ministries clearly have far greater latitude for innovation than their American state counterparts but have proven far more reluctant to use that authority. This process may be beginning to change, at least in select provinces, through a reframing that may borrow from earlier American experience. In Rabe's analysis of climate change policy, neither federal government demonstrated much engagement through 2008 but many American states became major players in the interim. Multiple states have adopted a wide range of policies to reduce greenhouse gas emissions, with increasing focus on multi-state regional collaboration, whereas most provinces are only beginning to turn to this area. In Carolyn Johns' analysis of water protection policy, major questions emerge about commitment and capacity of Canadian federal and provincial governments, including Ontario, in comparison with American neighbors. In none of these cases can it be suggested that the United States has "cornered the market" and resolved its environmental challenges through various types of policy development. But it remains striking when looking across environmental policy areas that there appears to be a frequent lag in Canadian engagement, which clearly complicates any form of cross-border collaboration.

GEOGRAPHIC SCOPE OF GOVERNANCE

The issue of shared environmental governance between two physically massive and economically advanced economies might imply a focus only on policies that bring together Ottawa and Washington, D.C. in some fashion. But as noted in the previous section, both Canada and the United States are formal federal systems, often with very significant differences in the degrees of authority delegated from central governments to provincial, state, or local units. In general, American environmental policies have tended to impose greater uniformity on states and localities than their Canadian equivalents (Rabe 2007; Harrison 1995), although this varies somewhat by time period and policy area. Nonetheless, the federal imprint, whether through legislation, agency implementation, or court decision, has fairly consistently tended to favor a more centralized and regulatory approach between nation and state in the United States as opposed to a more devolutionary and negotiable approach between nation and province in Canada. This adds to the complexity of sustaining collaboration and common policy across national borders; American states must generally respond more to their principals in Washington whereas their Canadian provincial counterparts retain far more bargaining power with Ottawa. Indeed, this provincial penchant for maximal rent-seeking from Ottawa given limited federal powers may contribute to the pattern of provincial lag in policy development noted above, as recalcitrant states are often more likely to face a heavy hand from Washington.

At the same time, this variation in decentralization within nations has not deterred considerable cross-border environmental governance that involves clusters of provinces and states rather than all units in both nations. A good deal of this activity, of course, focuses on the Great Lakes Basin, which defies national and sub-national boundaries and poses unique opportunities for regional approaches. Many chapters address various dimensions of Great Lakes environmental governance, whether fisheries through the Great Lakes Fisheries Commission or water quantity concerns through the Great Lakes Commission. Outside the Basin, cross-border environmental governance is also increasingly evident through negotiated agreements between other clusters of provinces and states, even in the absence of such a unifying focal point as the Great Lakes Basin.

An unexpected finding emerging from these chapters is the sheer magnitude of cross-border initiatives that feature some "bottom-up" quality, usually involving

two or more neighboring subfederal-level jurisdictions. As VanNijnatten notes, "cross-border regions" have emerged across the Canadian-American border, many with significant environmental governance emphases. She demonstrates substantial variability across these regions, contrasting the Great Lakes with the Pacific West, the Prairies-Great Plains, and the Northeast, suggesting regional variation may be greater than national differences. Alper's chapter on the Pacific West highlights the vast range of environmental policy experiments under way in that region, taking many distinct forms but further suggesting a growing trend toward carving up the binational relationship into a series of rather distinct regional entities.

In turn, many other chapters examine some variation on this kind of regionalism, either involving semi-formal agreements or more loosely-structured networks. We also see some indication of individual entities, most notably provinces or states, "going their own way" with unilateral efforts. This emerges in many examples of provincial or state policy tailored to localized circumstances, such as in Rowlands' analysis of the many differing policies that various provinces and states have developed to promote sources of renewable energy found within their boundaries. Individual provinces and states may well tailor policies to maximize the likelihood that any economic development will accrue within their boundaries, regardless of overall environmental consequences. This phenomenon also appears in other cases where there is a defined and driving issue framed, such as in Quebec, where LePrestre suggests that any environmental considerations in unilateral environmental policy taken by the province may take a back seat to issues of establishing political independence and a quasi-national identity. Clearly, individual provinces or states often take the lead in their federation, such as California and New York in the American case, but Quebec occupies unique territory in this regard, and remains fiercely independent despite its strong environmental interdependencies with other provinces and the United States.

Addressing Asymmetries in Governance

A long-standing concern in many dimensions of the relationship between Canada and the United States involves asymmetry, given the much larger economic and population base of the latter. This has long led to Canadian concerns about being subsumed by a hegemonic neighbor, either becoming homogenized into the American political economy or losing the capacity to forge an independent course in domestic and foreign policy (McDougall 2006; Stuart 2007). Applied to environmental protection, would Canada be quick to come into line with any American position in the environmental arena or would both nations maintain distinct styles and forms of policy? This issue tends to become particularly salient when the two nations explore some form of closer economic partnership, most notably reduction of barriers to the trade of goods and services. And there are some historic examples of convergence, most frequently involving Canadian decisions to emulate to some degree their American neighbors in certain policy areas (Hoberg 1997).

These concerns surfaced to some extent during the deliberations leading to the 1988 Canada-U.S. Free Trade Agreement and the 1994 North American Free Trade Agreement (NAFTA). Environmental concerns, however, were eclipsed to some extent by other issues, namely differences in the structure of the social welfare state and delivery of services such as medical care. The one environmental development emerging from these agreements was largely at American behest, through the creation of the North American Commission on Environmental Cooperation (NACEC) as a side-agreement to the NAFTA accords. NACEC was promoted by the Clinton Administration primarily to address American concerns about uneven commitment to environmental protection between the United States and it southern neighbor, Mexico. Since its creation on a tri-partite basis, NACEC has played a very modest role, perhaps most notable in its efforts to develop a uniform inventory on toxic emissions across the three nations. It retains a fairly low profile in most areas of environmental concern and is arguably still searching for a clear mission more than a decade and a half after its creation. This organization did gain new visibility in June 2009, when its annual meeting of the lead environment ministers in Canada, the United States and Mexico gained new saliency given the growing possibility of cross-border collaboration on energy and climate change.

There is little evidence that Canada has felt compelled to adhere to American environmental positions, either in developing domestic policy or working on cross-border issues. Indeed, a theme that emerges in a number of chapters is continuing Canadian distinctiveness from American governance styles. Internationally, for example, American repudiation of the Kyoto

Protocol in 2001 was followed by Canadian ratification the following year. As Rabe's chapter demonstrates, American states are the only entities to have formulated a serious policy response to climate change in the first decade after Kyoto, amid general indifference from provinces and both federal governments. Domestically, a number of major American reforms in air and water regulation have not been followed by similar steps in Canada. As noted above, the idea of Canada (or its provinces) remaining as a "laggard" of sorts emerges in many chapters. Thus, we find little indication that an asymmetrical relationship translates into literal dominance by the United States over Canada. Moreover, as Alper notes in his chapter, any national-level pressures toward convergence may be mitigated by the expansive role of regions, states, and provinces, as shifts in policy to this level "tend to equalize asymmetries in national power relations."

IMPACT OF GOVERNANCE

If sheer number of institutions and agreements is a proxy measure for volume of governance activity, Canada and the United States clearly would have one of the most densely-packed environmental governance systems of any two national neighbors on the globe. Our authors demonstrate an incredibly sizable and diverse set of governance arrangements, many of which overlap one another in both policy area and geographic territory. It might be understandable to assume that all of this effort translates into salutary outcomes. Most of these governing institutions receive little media or scholarly attention and so perhaps that is an indicator that all is well. There have certainly been few formal appeals or public demands for far-reaching transformation of these arrangements, perhaps further attesting to some form of effectiveness.

But scholars have long noted that environmental policy is a particularly difficult area in which to evaluate performance of various policies and agencies. Indeed, some contend that environmental policy organizations are obsessed with measuring "outputs," namely the number of actions taken or volume of work completed (Wilson 1990; Radin 2006; Moynihan 2008). For a state or provincial lead environmental unit, for example, annual reports are notoriously packed with such measures, ranging from the number of permits issued to the number of inspections completed in a given period of time (Rabe 2002). In contrast, one often finds little analysis in these documents of overall environmental quality trends, much less consideration of the relationship between all of that policy-focused labor and environmental "outcomes."

One century after the creation of the IJC, what can we say about the environmental impact of the commission and all subsequent efforts at cross-border environmental governance? In the words of one of our contributors, "does all of this activity make a whopping bit of difference" on environmental quality? In short, if one respectfully puts to the side all of the possible measures of outputs, including all of the reports, declarations, covenants, agreements, conferences, public hearings, consultations, guidances, memoranda-of-understanding, and the like that could be used collectively to define cross-border environmental governance in Canada and the United States, is it possible to identify actual environmental outcomes that have been influenced by those actions?

Many of our contributors to this volume found it very difficult to find hard evidence of environmental outcomes. Much of the existing literature is produced by individual agencies and commissions, with a good deal of it self-celebratory but thin on evidence of actual impacts. Aside from Gaden's positive account of outcomes in the case of Great Lakes fisheries and Sproule-Jones' somewhat comparable assessment of the assault against the sea lamprey, our authors detected little evidence of salutary outcomes and raised many concerns with direct impact on outcomes. In some cases, such as Heinmiller's discussion of water protection in the Prairie regions, it is clear that existing institutions such as the IJC have had enormous difficulty adjusting to catch up with changing realities. In that instance, the mechanisms for setting up water allocation plans more than seven decades ago remain largely in place. But they appear increasingly outdated in an era of "full allocation" and show scant capacity to address newer concerns such as resource preservation and environmental protection. More than two decades into the Remedial Action Plan process, Sproule-Jones finds little evidence of success,

with a particularly dismal performance record among RAPs that cross national or sub-national boundaries.

Beyond the orbit of the IJC, other chapters raise comparable concerns. Water quality concerns endure, particularly in the aftermath of tragic events in Ontario and Wisconsin. River restoration remains uneven, particularly in Canada. Greenhouse gas emission rates remain incredibly high on a per capita basis in both nations and the rate of growth since the 1990s has been substantial in both nations. Transition to a cleaner set of electricity and energy sources has begun but haltingly at best, leaving both nations heavily reliant on fossil-fuel sources for electricity and transportation, with significant impacts on climate change and other air emissions.

Even when one turns to the great new hope of cross-border environmental governance, through expanded roles for regions across the continent, there is very little evidence of positive environmental outcomes. Once again, the measure of sheer outputs is staggering, particularly in the Great Lakes, Pacific West, and the Northeast. But neither the VanNijnatten or Alper chapters, nor most of those that examine some aspect of the Great Lakes, provide much indication that this frenetic pace of activity translates into improved environmental outcomes.

COLLECTIVE IMPACT AND PREPAREDNESS FOR THE NEXT CENTURY OF ENVIRONMENTAL GOVERNANCE

Scholars have long concluded that most governmental agencies and related institutions tend to approach immortality. Herbert Kaufman confirmed this pattern in the United States in earlier decades and there is little evidence of subsequent change in either nation (Kaufman 1976). It is difficult to eliminate such institutions once they enter into operation, after routines and dividing lines are established, at least in the absence of some cataclysm that reveals poor performance and triggers new initiatives (Baumgartner and Jones 1993; Pralle 2006). For nearly four decades, for example, reformers have attempted to correct the original design flaws that continue to leave the U.S. Environmental Protection Agency deeply fragmented by medium, function, and region, and highly suspect in terms of its impact on environmental outcomes. Of course, the EPA is not alone in this regard. Many similar critiques have been raised concerning Environment Canada as well as entities outside the arena of environmental protection. At the same time, many of the existing institutions responsible for some form of cross-border environmental governance have also proven resilient in the face of needed adaptation, even as the sheer number of institutions and individuals with some role in this process has continued to proliferate and potential competition for turf has increased.

But the centennial of the IJC prompts us to ask not only about the performance of individual institutions but also consider their collective environmental impact, or, possibly, lack thereof. Are there viable indicators of necessary collaboration across institutions as well as internal capacity to respond to changing circumstances? Or do these various players cling to established turf and traditional functions, thereby oblivious to pressing needs and future challenges? Our contributors suggest that much of the patchwork of cross-border environmental governance is difficult to evaluate and may indeed be lacking. It remains difficult to discern any collective impact of this collage of efforts. This does not mean failure or inadequacy in each and every case but does underscore the need to look afresh at this arena and possibly consider other governance arrangements to face these challenges in future decades.

Quite aside from the performance of recent decades, these chapters also raise sobering concerns about the capacity of existing governance arrangements to adapt to and address emerging environmental challenges. It is the nature of this volume that many chapters introduce major new challenges and give little indication that existing institutions are adapting or even beginning to respond to them in meaningful ways. Is the IJC capable of modifying its approach to river governance now that, as Heinmiller noted, "full allocation has been reached" and new approaches may be in order? Can the tapestry of institutions responsible for all aspects of water quality adjust to address such challenges as non-point pollution, cross-media pollutant transfer, and water diversion? Does it make sense to maintain RAPs when they have accomplished so little to date? As Johns asked during our conference, "We have been at the RAP process for a long time. Is twenty years the beginning or

the end?" Have we even begun to scrape the surface in establishing viable governance regimes for promoting transition toward cleaner and renewable energy sources and finding methods to achieve significant reductions in greenhouse gas emissions, thus enabling Canada and the United States to lead the world in minimizing the effects of climate change?

Looking ahead, one great challenge will be developing institutions and policy professionals capable of cutting across traditional boundaries and achieving greater integration of effort. This need not require an extreme shift toward centralization or the loss of innovation that emerges from decentralized efforts involving provinces, states and regions. But it is consistent with Alper's note that "institutions and processes are needed that cut across fragmented territorial units and mobilize stakeholders, funding and expertise to achieve effective resource management." In turn, this would appear to coalesce with Sproule-Jones' discussion of "synchronicity" and its call for greater integration across various institutions.

One starting point would be a candid review of the International Joint Commission. As Brooks has noted, the "submergence" of the Commission is increasingly evident, suggesting the need either for far-reaching reform or replacement with an alternative structure. It is striking that no environmentalist has ever served as an IJC commissioner and that much of the agenda for which it was established has long since been eclipsed by other issues, many of which are outlined in chapters in this volume. Brooks begins to examine alternative models and even what a post-IJC world might look like in the concluding chapter. This is entirely consistent with U.S. Secretary of State Hillary Clinton's June 2009 expression of respect for the historic role of the IJC but suggestion that the time has come for considering new governance approaches.

Trans-border environmental governance involving Canada and the United States might also take new shape through linkage with other vital issues. Energy, national security, climate change, water access, and economic development will likely dominate the agenda of future Parliaments and Congresses, as well as state and provincial counterparts. All of these are also interwoven with environmental ramifications and present unique opportunities to build bridges and linkages across conventional boundaries. They provide not only opportunities to re-frame issues to respond to the challenges of the current period but also a chance to distill lessons from what did—and did not—work during the past century of cross-border environmental governance.

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The Canadian-U.S. Boundary Waters Treaty, which marks its centennial this year, is a remarkable achievement of foreign relations and environmental policy making. It broke new ground by resolving, on a platform of bilateral equality, a number of transboundary water conflicts and establishing a broad regime for the joint management of water resources across the Canada-U.S. border. Yet the record also shows that the International Joint Commission, the binational environmental authority brought into existence by the treaty, is at risk of becoming marginalized or sidelined on matters of sharp controversy and consequence. In this article, the conundrum between the perceived and real impact of the IJC is explored in interviews with past IJC commissioners and chairs, who were questioned about their personal characteristics for the job, how they regard their role, and their differing viewpoints. Even as the IJC enters a second century, there is debate about its institutional purpose and scope. Ultimately that could prove constructive, as one of the greatest threats to the IJC's relevance is its own lack of definition and clarity, enhancing the possibility it will become lost or submerged within a crowded sea of institutions devoted to studying, advocating and regulating cross-border environmental problems.

Chapter 2: The International Joint Commission: Convergence, Divergence or Submergence?

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When the International Joint Commission was created by the Boundary Waters Treaty of 1909, it was *the* institution for the management of transboundary environmental relations between Canada and the United States. Since then the map of institutions and processes for studying, advising, advocating, resolving and regulating these relations has become vast and complicated, in part a reflection of the explosive growth in the number and complexity of the issues that arise in transboundary environmental governance. The IJC continues to be an important part of this network of cross-border environmental management.

The IJC and the Boundary Waters Treaty of 1909 express the possibility of convergence between the policies of Canada and the United States, institutionalizing a decision-making process based on equal representation of the treaty's signatories and the idea that commissioners should rise above mere national interests in deliberating and recommending on matters of shared concern between the two countries. But the selection of IJC commissioners for each of the national sections of the IJC has always been the prerogative of the respective governments, creating at least the potential that the backgrounds and outlooks of Canadian and American commissioners might differ in significant ways. The possibility of divergence on the Commission is, therefore, created by the manner in which commissioners are selected. Over the one hundred years of the IJC's history, the Commission's status as the preeminent institution for the management of transboundary environmental matters has been diluted, not necessarily through any failures on its part, but as a result of the multiplication of cross-border institutions, agreements and process-

es, formal and informal. An undeniable submergence has taken place in the IJC's status and, some argue, its importance, as the field of players engaged in transboundary environmental governance has become more crowded and competitive.

This chapter examines the forces of convergence and divergence that operate within the IJC and that are linked to the built-in contradictions that exist between its form—which stresses national equality and impartiality—and its function, which inevitably must be affected by national differences in outlook and interests. The paper concludes that the ability of the IJC to manage transboundary environmental issues between Canada and the United States, to the extent that the 1909 treaty assigns it this function and governments have been willing to permit the Commission to play this role, is necessarily limited by the tension between these forces of convergence and divergence. But possibly even more important has been the submergence of the IJC, particularly since the 1960s, under a growing tide of transboundary processes and institutions. This second factor is described in many of the contributions of this book and is a theme that we return to in the final chapter.

THE BOUNDARY WATERS TREATY AND THE IJC AS AN INSTITUTION FOR THE CONVERGENCE OF POLICIES

It is in the nature of international treaties to impose obligations on and establish rights for the governments that sign them. Treaties often include rules and mechanisms for dispute resolution and other forms of decision-making. Diminished national sovereignty or, to express it a bit differently, shared sovereignty in the area covered by a treaty is, at least in theory if not always in practice, the result of the agreed-upon rules and structures that the treaty creates.

The Boundary Waters Treaty of 1909, Article III of which creates the International Joint Commission, was and remains a rather exceptional treaty in terms of the rules and decision-making structures that it established for transboundary environmental governance. Signed during an era when the management of border disputes between the United States and Canada—the latter represented by the United Kingdom—was a prominent and often thorny aspect of the bilateral relationship between these countries, the Boundary Waters Treaty resolved a number of specific conflicts. These included a general ban, with some exceptions, on water diversion from the Niagara River above the Falls (Article V) and agreement on the apportionment of water in the St. Mary River and Milk River watersheds.

These were already important accomplishments. But the Treaty went much further than the resolution of a couple of longstanding water disputes. It established what may well have been an unprecedentedly broad regime for the joint management of water resources across the Canada-U.S. border under the auspices of a decision-making body, the IJC, whose form was exceptional. Indeed, in matters of both function and form, the Boundary Waters Treaty broke new ground. Article II establishes a reciprocal right of national treatment in the case of injury arising from interference with or diversion from boundary waters, stating that each country shall have "the same rights and entitle the injured parties to the same legal remedies as if such injury took place in the country where such diversion or interference occurs." Article III limits the sovereignty of each government by requiring IJC approval for any diversion or obstruction that affects "the natural level or flow of

> "The Boundary Waters Treaty was and remains a rather exceptional treaty in terms of the rules and decision-making structures it established for transboundary environmental governance.

boundary waters on the other side of the line." Article VIII imposes yet another limitation on national sovereignty by requiring IJC approval for the construction of dams or other obstructions "involving the elevation of the natural level of waters on either side," and authorizing the IJC to establish conditions for the protection and indemnity of interests on the other side of the border. Finally, Article IX assigns the IJC a potentially sweeping role in transboundary governance that goes far beyond the joint management of water resources. The IJC is empowered by the Treaty to study and report on "any other questions or matters of difference arising between [Canada and the United States] involving the rights, obligations, or interests of either [country] in relation to the other or to the inhabitants of the other, along the common frontier between [them]." This function may be triggered by a reference from either national government or from both. Although the IJC's report and recommendations would be in no way binding on either government or interests on either side of the border, the mere fact that the Treaty expressly provides for referrals on virtually any transboundary issue suggests that some of those involved in its drafting anticipated the possibility that the IJC's governance function might go beyond water.

No less exceptional was the form chosen to carry out the transboundary environmental governance activities specified in the Treaty. The idea of a bilateral commission with representation from both countries was not new. The Alaskan Boundary Commission had been created several years earlier with representation from the United Kingdom (1 member), Canada (2) and the United States (3). What was novel about the IJC was the fact that both Canada and the United States were assigned three representatives (each country having a national section chair who would preside over meetings in his or her country). Article VIII of the Boundary Waters Treaty specifies that the Commission shall decide cases according to the majority principle and Articles IX and X also provide that a report based on a reference also requires the support of a majority of commissioners, failing which the national sections may submit separate reports which would then be submitted to an independent umpire under Article XLV of the Hague Convention. Given the equality of national representation on the Commission, it very quickly became clear that the decision-making style of the IJC would have to be consensual. Unanimity is not a requirement, but as a practical matter nothing can be accomplished without some degree of binational consensus.

"Unanimity is not a requirement, but as a practical matter, nothing can be accomplished without some degree of bilateral consensus.

Three other features of the IJC as a decision-making body warrant mention. First, under Article XII of the Treaty, each commissioner is required to sign a "solemn declaration" that he or she shall "impartially perform the duties imposed upon him under this treaty." This is a clear indication that commissioners are not to view their role as that of advocates for their respective national interests, much less as loyal water carriers for whatever administration or government nominated them to the IJC. Second and related is the fact that the Treaty does not empower either national government to issue instructions to its national section of the commission. The IJC enjoys, therefore, a degree of formal independence from governments that is almost without parallel. Finally, certain decisions of the IJC are final and may not be appealed to or overturned by national governments. Article IV states that the IJC's decisions will be final in cases arising under Article III of the Treaty involving applications for water obstructions or diversions that affect "the natural level or flow of boundary waters on the other side of the [border]." Final decision-making authority is also conferred on the IJC by Article X of the Treaty, which authorizes the governments of Canada and the United States to refer transboundary matters—not just water management issues—to the Commission for binding arbitration. The IJC has never received such a reference.

Final authority on some matters, equality of national representation and a potentially vast scope for investigating and making recommendations on virtually any matter with transboundary implications: it adds up to a rather exceptional institution with what seem to be quite important powers. But one of the puzzles associated with the IJC is the range of judgments on the Commission's importance and effectiveness in transboundary environmental governance. Alongside glow-

ing tributes to its significance and accomplishments one also encounters dismissive and sometimes highly critical assessments of the IJC. Consider the following evaluations and observations:

- Writing just after the completion of the Columbia Treaty negotiations between Canada and the United States, G.V. La Forest referred to the "transcendent importance" of the IJC in Canada-U.S. relations. (Deener: 37)

- Roughly forty years after the signing of the Boundary Waters Treaty, G.W. Brown stated his view that "[The IJC is] the most important single agency for peaceful settlement so far established between Canada and the United States." (Brown: 26)

- In his book, *Canada and the United States: The Politics of Partnership*, Robert Bothwell observes that "over the years the IJC resolved a fair number of transboundary annoyances." But he also expresses the view that the Commission is of rather marginal importance, reflected in the fact that "relatively few people…know of it" and that it has fallen far short of the hopes of Elihu Root, the American secretary of state who signed the Boundary Waters Treaty and who expressed the wish that it would "set an example to the world by the creation of a judicial Board as distinguished from a diplomatic and partisan one to deal with all these matters." (Bothwell: 9).

- Most volumes of the Canadian Institute of International Affairs, longstanding "Canada in World Affairs" series make only brief and passing mention of the IJC. In no annual issue of Carleton University's prestigious "Canada Among Nations" series, between 1996 and 2006, is there a single mention of the IJC, despite the fact that every year there are chapters devoted to aspects of Canada-U.S. relations.

- The leading textbooks on American foreign policy make no or only passing mention to the IJC.

An evaluation of how well the IJC has done its job is beyond the scope of this chapter. In any case, such an evaluation would have to be based on some measurable criteria concerning the Commission's functions, including original and evolving expectations for the IJC and the possibilities realistically open to the Commission to influence in various ways outcomes related to transboundary environmental governance. This is, to say the least, a difficult challenge. It should be, however, less problematic to examine and assess the IJC model of transboundary environmental governance with an eye to identifying the forces of convergence and divergence on the Commission.

RESOLVING NATIONAL DIFFERENCES: SUGGESTIONS OF DIVERGENCE IN THE SECONDARY LITERATURE ON THE IJC

The terms of the Boundary Waters Treaty, the original aspirations held for the IJC, and the model of consensus decision-making that quickly became the Commission's hallmark all suggest convergence between the interests and outlooks of Canada and the United States. But much of the secondary literature on the IJC, written by those not directly associated with the Commission, suggests that divergence has occurred in cases where the issue being dealt with was controversial and the stakes were perceived by governments as being high. What happens when the interests of the two countries represented on the IJC come into serious conflict?

Elihu Root's original and ambitious vision for the IJC as an impartial arbiter for the management of transboundary environmental issues struck the shoals of reality early. In 1918 the IJC issued what Robert Bothwell describes as an "ambitious transnational regime" to clean up pollution in the Great Lakes. "The idea was so ambitious," says Bothwell, "that it was promptly buried." Although he acknowledges that the IJC proved to be much more effective just more than a decade later when it awarded damages on the American side as a result of pollution caused by a smelter at Trail, B.C., Bothwell argues that this case was a particularly egregious one and did not leave as its legacy the sort of robust joint management of transboundary environmental issues that Root has envisaged.

The stakes were certainly high in the case of the protracted negotiations that finally led to the Columbia

River Treaty in 1961. The IJC had been involved in studying the environmental consequences of dam construction and flooding of the Columbia River valley since 1944 and issued two reports during this time. In the end, however, the determination of what to do was worked out through government-to-government negotiations. The former chair of the Canadian section of the IJC, General A.G.L. McNaughton, was outspokenly critical of the Treaty, a fact that just seemed to confirm that if the gap between the IJC's view and that of the politicians was too wide, the IJC would be sidelined in preference for other decision-making processes and venues.

Although the IJC operates without instruction from either government, the specific terms of a reference to the Commission may impose limits rather similar to government instructions. This was the case, for example, when the Canadian and American governments agreed to refer to the IJC the study of the environmental consequences of raising the Ross Dam at the border between British Columbia and Washington. The reference expressly prohibited the commissioners from commenting on whether the project should proceed and stated that the IJC's recommendations should be "not inconsistent" with either the 1942 decision that had approved a raising of the dam and therefore an extension of the dam's reservoir into Canada or a 1967 deal by which British Columbia had agreed to increased flooding in return for an annual cash payment.

The Ross Dam case is particularly interesting for what it seems to reveal about the potential of the IJC to be an important venue for decision-making when the stakes are high. The Canadian government was opposed to the additional flooding in British Columbia that would result from raising the dam. The issue dragged on until 1984 when Seattle agreed not to raise the dam and to provide cash compensation to British Columbia in exchange for an 80-year guarantee of electrical power exported from the province. The U.S. regulatory process and governments on both sides of the border were important in the resolution of this drawn-out conflict, but the IJC appears to have been on the sidelines.

Contentious, high-stakes issues do, however, reach the IJC from time to time. One such issue involved record high water levels in the Great Lakes in the early 1970s, causing widespread flood damage in 1972 and 1973. Reflecting on the IJC's part in the resolution of what became a source of conflict between Canada and the United States, Peter Dobell writes:

"Although the IJC operates without instruction from either government, the specific terms of a reference to the Commission may impose limits rather similar to government instructions.

President Nixon was pressed in December 1972 by congressmen from the Great Lakes states to initiate negotiations with Canada to reduce the flow of water into the Lakes. Early in 1973 the Subcommittee on Inter-American Affairs of the House Committee on Foreign Affairs began hearings on complaints that the IJC had not done all it could to keep water levels from reaching record heights. These direct pressures on the Administration led to an insistence by the American section of the IJC that the flow of water out of Lake Superior be temporarily reduced at the locks at Sault Ste Marie. The Canadian section of the Commission was given only eleventh-hour notice of the United States' intention and agreed reluctantly on 30 January to reduce the outflow and then only to preserve the traditional unanimity of commission decisions. (Dobell: 103)

At roughly the same time the IJC had been assigned a case that did not, strictly speaking, involve boundary waters. This was the 1971 Point Roberts reference. Point Roberts is a small piece of American territory that juts south from British Columbia and is physically separated from Washington State by Boundary Bay. The residents of Point Roberts and developers pushed for water exports from geographically contiguous British Columbia into the community, a proposal that met with strong opposition from the provincial and local governments on the Canadian side. The IJC had established a binational committee to study and recommend what to do about the water supply problem at Point Roberts. Its proposal that Point Roberts be made an international park, jointly administered by Canada and the United States, was strongly opposed by community interests. Unable to reach binational agreement on what to do, the IJC essentially abandoned the issue in 1977.

THE IJC MODEL

Commissioners on the IJC are very proud of the Commission's tradition of consensus decision-making. It is at the top of the list of Commission attributes mentioned by virtually every commissioner, past and present, in explaining how the IJC operates and why they believe it has been successful. Canadian Prime Minister Mackenzie King would regularly mention the IJC model of binational cooperation as one that deserved to be emulated throughout the world. The IJC was routinely and glowingly mentioned by Canadian spokespersons in what became known as the "Canadian speech" at League of Nations meetings. After WWI the IJC was proposed by Canadian officials as a model for resolving the border conflict between France and Germany, and in more recent times, the IJC has generated interest from as far away as the Middle East as a model that might have some applicability to governance in Jerusalem.

But aside from rather general observations about how the IJC model works, observations that have usually come from commissioners themselves or from bureaucrats working for the IJC—what Barry Rabe's introduction to this volume calls "internal self-assessment"—almost no empirical work has been carried out on who the commissioners are, their backgrounds, how they have viewed their role on the IJC, how the experience of serving on the Commission may have influenced their outlooks, and the consequences of these factors for IJC decision-making.

The possible importance of the backgrounds and role perceptions of commissioners is suggested by the fact that the IJC has had, over the years, a considerably higher profile in Canada than in the United States. In all frankness, it must be acknowledged that the IJC has not had much of a profile in either country outside of the Great Lakes region, except when some very contentious issue has arisen such as the Devil's Lake controversy at the North Dakota-Manitoba border or the protracted dispute over management of the Columbia River that led to the Columbia River Treaty. But within the hierarchy of public sector organizations there can be little doubt that the IJC is generally seen to be higher within Canada than it is within the United States. This point was brought home by the remarks of a former American commissioner who said that when he was contacted by the State Department about whether he might be interested in being nominated to the IJC he asked, "What does it do?" The State Department official replied that he was not sure, but that he would check into it and get back to this potential nominee.

> "The IJC has had, over the years, a considerably higher profile in Canada than in the United States.

Having a higher profile and greater institutional prestige in Canada than in the United States might be expected to produce asymmetry in the caliber of appointees to the two national sections. It would seem not unreasonable to expect that the Canadian appointees would tend to have a higher status within Canadian public life than their American counterparts have within their country. A number of background asymmetries might conceivably be generated by the simple fact of the Commission being viewed a "bigger deal" north of the border. This could, in turn, produce a dynamic within the Commission whereby Canadian commissioners tend to attach greater importance to the IJC's work and see its role and possibilities in transboundary environmental governance differently from their American counterparts. Or it could be that the shared experience of working together on the IJC dulls the impact of background and initial expectations of Canadian and American commissioners and generates greater convergence in their outlooks and behavior.

In any case, there are good reasons to think that who decision-makers are, including their backgrounds, expertise, expectations and role perceptions, will affect how they see and perform their job. Moreover, the impact of the IJC's form on commissioners' outlooks and behaviour—involving equal national representation and a tradition of consensus decision-making on an

agency that enjoys exceptional independence from the governments that finance it—is certainly relevant to any evaluation of what has been described as an institution of "transcendent importance" in Canada-U.S. relations, but also as one that is rather marginal and disappointing.

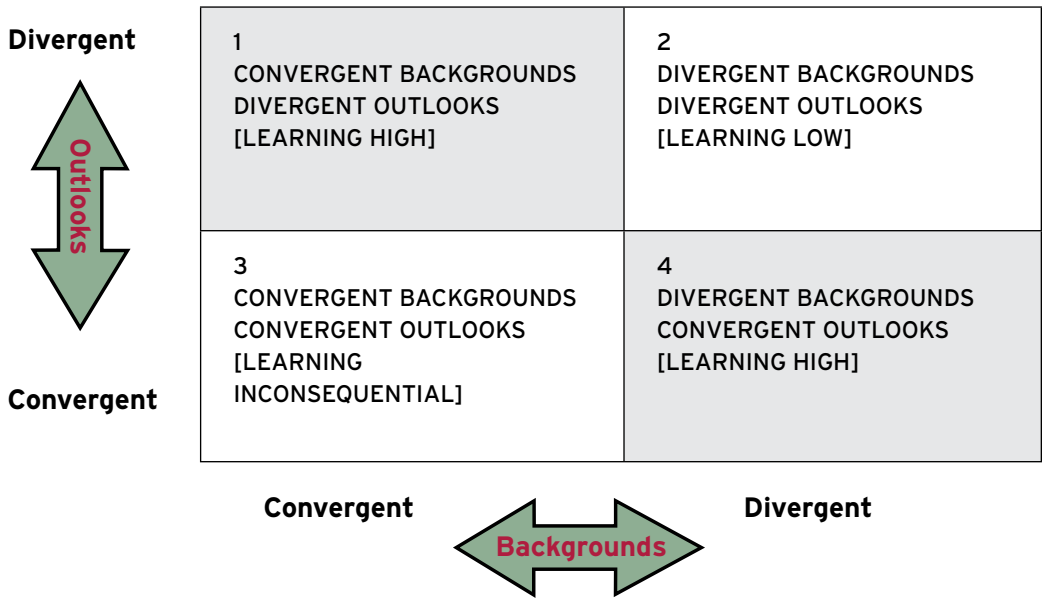
To better understand the possibilities and limits of the IJC model of transboundary environmental governance, the remainder of this chapter examines the background and outlooks of IJC commissioners. Interviews were conducted with eight current and past commissioners, five from the American section and three from the Canadian side of the IJC. The questionnaire that formed the basis for all of these interviews, adapted as needed to the circumstances of each, is found in Annex 1. This information was supplemented by the reflections of some of the commissioners, past and present. Although most of this latter material very definitely falls into the category of "internal self-assessment" and is not particularly revealing, former U.S. section chair Gordon Durnil's book, *The Making of a Conservative Environmentalist*, is something of an exception to this rule.

Information on the backgrounds of the commissioners was drawn mainly from such sources as the Canadian and American versions of *Who's Who*, biographical material available in the Canadian parliamentary and U.S. congressional records, and various online sources. This material was relatively easy to obtain for those who have served on the IJC over the last three to four decades. It was more difficult to find reliable or in some cases any pertinent information for some of those who served on the Commission during its first several decades, although this was not a problem in the case of more prominent commissioners or those who had held elective office. Information was not found for about one-quarter of the 83 persons who have served on the Commission, creating the possibility that the finding reported below may not accurately reflect the reality of the IJC membership over its one hundred-year history.

BACKGROUNDS AND OUTLOOKS: A MODEL

Differences in background may be associated with differences in outlook. Engineers and environmental activists, for example, may have very different outlooks on a dam intended to generate electrical power or a water diversion for agricultural purposes. Likewise, someone who has spent her career in the public service might be expected, other things being equal, to bring a somewhat different outlook to bear on environmental management issues than a person who comes from a business background. Obviously it is not possible to predict a person's outlook on environmental or other matters from a handful of facts about her back-

FIGURE 2.1: Divergence and Convergence in the Backgrounds and Outlooks of Canadian and American Commissioners: Four Possibilities



ground. But we know that such differences can matter and thus discovering a pattern of differences between Canadian and American commissioners might at least be suggestive of a difference of outlook, independent of that which is produced by the fact that they come from and represent two different countries whose culture and belief systems are not identical.

Figure 2.1 identifies four possible scenarios that might characterize IJC commissioners at any point in time. The vertical axis measures the similarity (convergent) or dissimilarity (divergent) of commissioners' outlooks after serving on the IJC for a certain period of time. The horizontal axis measures the similarity or dissimilarity in the background characteristics of commissioners from the two national sections. It is impossible to acquire accurate information on the initial role perceptions of former commissioners who cannot be interviewed, so I am making the bold assumption that background may be a rough-and-ready surrogate measure for initial role perception.

Quadrants 1 and 4 involve relatively high learning as a result of the experience of serving on the IJC. Intuitively, the scenario in Quadrant 1 seems improbable and it is, moreover, at odds with most of what has been written about the IJC. Quadrant 4, on the other hand, seems plausible. The factors that might contribute to a learning experience that produces increased convergence in the outlooks of commissioners from each national section include the following:

- Many appointees have little background in the policy matters dealt with by the IJC, making it more likely that they will be open to influence from those who have expertise.
- The scientific character of much of what the IJC deals with and those with whom commissioners interact will reduce the importance of partisanship and other political influences on commissioners.
- The limited authority of the IJC may reduce the weight of partisanship and nationality in commissioners' perceptions of their roles.
- Commissioners on the IJC, unlike ambassadors and State Department officials, do not receive instructions upon appointment.

Quadrant 3 describes a scenario where the IJC experience's impact on commissioners' outlooks is inconsequential. This scenario is possible, but as we will see, there are some patterns of difference in the background characteristics of Canadian and American commissioners. Moreover, we should not lose sight of the fact that commissioners come from two different societies and therefore there exist, *prima facie,* grounds on which to assume that their outlooks will reflect cultural differences between Canada and the United States. Quadrant 2 suggests that IJC decision-making is characterized by a high degree of conflict between the national sections and stalemate, neither of which has been typical of its operations. Both 2 and 3 involve scenarios where a low level of learning takes place as a result of serving on the IJC.

Based on a preliminary survey of some of the secondary literature on the IJC, four specific expectations were identified before examining the actual backgrounds of commissioners and conducting interviews with a sample of them. They include the following:

- Canadian appointees have higher status within Canadian politics and society than American appointees do within the U.S.
- U.S. commissioners are appointed later in their careers than are Canadian commissioners.
- Partisanship is more important in U.S. appointments, so American IJC appointees are less likely to have environmental expertise than Canadian appointees.
- Service on the IJC tends to generate some degree of convergence in the outlooks of commissioners from the two national sections.

BACKGROUND AND OUTLOOKS: FINDINGS

Of the four expectations identified above, only the last two were supported by data collected from biographical material on IJC commissioners and from personal interviews. It is, of course, rather difficult to measure the status of a commissioner within their political system and country, and both the Canadian and American sections of the IJC have included a fair share of "notables." On the American side, the early history of the IJC saw a number of prominent members of Congress appointed, including Senator Thomas Carter (Montana-R), Congressman James Tawney (Minnesota-R), and Senator Clarence Clark (Wyoming-R), particularly to the position of U.S. chair. It may be fair to say—although this is a judgment call—that the relative status of U.S. appointees has declined somewhat in recent decades from what it was earlier in the history of the IJC. On the Canadian side there seems to be greater consistency over time in the relative status in Canadian public life of those appointed to the Commission. For chairs in particular this status has usually been fairly high, including such prominent figures as Thomas Chase Casgrain, Arnold Heeney, General Andrew Macnaughton, Maxwell Cohen, Davey Fulton and Herb Gray.

The second expectation is that American commissioners will tend to be appointed later than their Canadian counterparts. If the IJC has less relative visibility and prestige in the United States than in Canada then it seemed to make sense to assume that those appointed to the American section would tend to be older at the time of their appointment than is true for Canadians on the Commission. Appointment to the IJC would be more likely to be seen as a final stint of service before retiring from active public life.

In fact, however, the average age of U.S. commissioners when appointed is 59.5 years, compared to 57.9 for Canadian commissioners. The data on which these averages are based is, however, incomplete. It included 28 of 43 U.S. commissioners (65 percent) and 27 of 40 Canadian commissioners (68 percent) over the period 1909 to 2007.

The expectation that partisanship is somewhat more important in American nominations to the IJC, and that American commissioners are less likely than Canadian appointees to have experience in environmental issues when appointed, found some support in the background data on commissioners. Table 2.2 shows that appointees with backgrounds in Congress or state politics have constituted 71 percent of all American commissioners, compared to 48 percent of Canadian commissioners who had served in Parliament or been elected to a provincial legislature. The public service and academe have been more important recruiting grounds for Canadian than American commissioners. Careers in business or engineering constituted the dominant professional background of only a handful of commissioners on both national sections, although a couple of these individuals served as national section chairs, including Claude Lanthier on the Canadian side and Roger McWhorter on the American side. Again, the data was incomplete, with reliable information on 34 of 43 U.S. commissioners (79 percent) and 31 of 40 Canadian commissioners (78 percent). Caution is therefore advised.

> "Partisanship plays a larger role in American nominations to the IJC.

Table 2.2: Career Backgrounds of IJC Commissioners

Career	Canada	United States
Parliament/Congress	35% (11)	53% (18)
Provincial/State politics	13% (4)	18% (6)
Public service (non-elected)	19% (6)	9% (3)
Business	13% (4)	6% (2)
Academe	16% (5)	9% (3)
Engineering	3% (1)	6% (2)

The final expectation is about the impact that service on the IJC has on commissioners' outlooks and thus goes to the heart of evaluating the IJC model. Personal interviews with eight commissioners, past and present, and including several national chairs, formed the main basis for this assessment. This represents only one-tenth of all those who have served on the IJC and, moreover, includes only commissioners who have served over the past couple of decades. It is quite possible that commissioners who served earlier in the IJC's history might have responded differently to the questions put to these more recent commissioners. On the other hand, insofar as one wishes to understand how the IJC functions today, including its possibilities and limitations, the outlooks and experiences of recent commissioners are those that matter.

Asked about the circumstances of their appointment to the IJC, four commissioners indicated that they had requested a position on the IJC and four said that their name had been put forward by someone else—a governor or senator, for example—but that they had not specifically asked for an appointment to the Commission. All of those who had not requested an appointment to the IJC had low prior knowledge of the Commission and its role. Among those who asked for an IJC appointment, three began with a fairly high level of knowledge of the Commission and one both had an interest in environmental issues and was aware of the IJC, but mentioned the fact that American commissioners are not required to reside in the D.C. area as a key factor in the decision to request a position on the IJC. One of the eight commissioners interviewed had what could be described as a strong prior background in environmental policy and another had a background in the natural sciences that made the commissioner familiar with the scientific and environmental modeling issues that come before the Commission.

It should be said that it has not been the policy of either government to appoint well-known environmentalists to the IJC, although there have been some exceptions to this rule. Pierre Béland, appointed by the Canadian government in 1995, was just such an exception. Adèle Hurley, appointed Canadian chair in that same year was also well-known in environmental circles for her policy advocacy work on the acid rain issue. Some commissioners, notably American section chair Gordon Durnil, became environmentalists of some public reputation as a result of the experience of serving on the IJC.

> "Had the IJC inserted itself forcefully into the acid rain issue in a way that had driven a wedge between the Canadian and American governments, there is a good chance that would have accelerated efforts or opinions aimed at marginalizing the IJC's role in policy making on the American side of the border.

The fact that so few individuals who have served on the Commission lack either serious scientific credentials in environmental matters or a background in environmental policy-making or advocacy may seem puzzling. On the other hand, the experience of Canadian commission chair Adèle Hurley may help to explain why this is so. Hurley resigned less than one year after her appointment in a dispute with her fellow commissioners over a report on acid rain. Had the IJC issued a formal written report to the Canadian and American governments, as Hurley believed ought to have been done, sections of the Clean Air Act would have been triggered to limit the U.S. government's plan to allow some deregulation of coal-burning power generation in the Midwest. Instead, the IJC made oral representations to the two national governments—representations that effectively were ignored—avoiding what surely would have been a political imbroglio in the U.S. over the IJC's role and power. As a longtime environmental advocate who had been active in Canada on the acid rain issue for well over a decade, Hurley apparently found herself unable to compromise her well-known beliefs on coal-burning electricity generation.

Environmentalists applauded her choice. But one might speculate on what the consequences would have

been if Hurley had won the day and the IJC's written report and recommendations had been released. The Commission had already acquired a reputation in some governmental circles, on both sides of the border, as an extension of the environmental movement and anti-industry. Some observers believed that it had become "captured" by the movement under Gordon Durnil's leadership, when the issue of industrial chlorine discharges into the water system was high on the IJC's agenda. Had the IJC inserted itself forcefully into the acid rain issue in a way that would have driven a wedge between the Canadian and American governments, this probably would have accelerated its marginalization in the policy-making process on the American side of the border.

Adèle Hurley clearly had a vision for the IJC, and when she found that its behavior did not conform with that vision she was quick to resign. In this respect she was surely exceptional. Only a couple of the eight commissioners interviewed could truly be said to have begun their terms on the IJC with an existing set of goals or a sense of direction for the Commission. In both cases these goals and this direction involved reining in the IJC which, in the case of one commissioner, was perceived to be "the most powerful commission in the world." This description, expressed half-seriously, was based on this appointee's experience with an issue on which the IJC had taken an active and, in this commissioner's view, very negative role during their term.

The other commissioner who started his/her term with an idea of the direction the IJC should go believed that the Commission had in some respects overreached its proper role at points in the recent past, particularly during the 1980s and 1990s. "I thought that the IJC had become too activist," the commissioner said, mentioning in particular his/her perception that the IJC's Windsor office, created in the early 1970s, had become a sort of advocate for the environmental movement and the IJC's support for the ban on chlorine discharges as an example of environmental advocacy trumping sound science. This commissioner believed that the IJC's permanent staff was part of the problem of bias that had developed over time on the Commission, observing that "It's a bit like having Greenpeace work for you."

All of the commissioners were asked about the sources of their goals and sense of what the IJC should be doing, including their role on the Commission, and who or what influenced their initial expectations and acquisition of knowledge about the IJC activities. Commissioners could mention more than one factor that contributed to their learning about and expectations for the IJC, but in fact most of them mentioned only one factor or indicated that a particular one was dominant in their initial learning about the Commission. Three of the commissioners, all of whom had requested appointment to the IJC, acquired their knowledge and expectations before their nomination. Only a couple of commissioners mentioned a formal briefing by IJC staff as an important part of their initial learning experience and a couple commissioners specifically said that they had not received any formal briefing. Three of the commissioners mentioned IJC staff members, in every case by name, as being important to their acquisition of knowledge about the IJC and their role on it. Another couple of commissioners stressed the importance of on-the-job learning. What was most evident, however, was the relatively unstructured and informal nature of the process of learning to be an IJC commissioner. Former U.S. section chair Gordon Durnil addresses this point in his book, *The Making of a Conservative Environmentalist*:

> *The learning curve is sharp for new commissioners, but it is up to them to make the job what they want it to be. They can quietly sit back, making no waves, issuing non-controversial and inconsequential reports. They can be receptacles of irritable government problems, hiding these problems from public view as they quietly spend years studying them. Or they can get ahead of the curve. They can be catalysts for government action at the state and provincial, federal and even international levels. (Durnil: 175)*

In regard to the interaction of IJC commissioners with officials from other parts of the state, the interviews made very clear that this is mainly—and, under some national section chairs, exclusively—a function of the Canadian and American chairs. This similarity aside, there appear to be some national differences that are related to the institutional differences between the Canadian and American systems of government and perhaps also to the relatively greater status that the IJC enjoys in the Canadian policy-making community compared to in the United States. On the American side, visits to members of Congress for what one commissioner called "budget maintenance" purposes appear to be common, as is occasional testimony before congressional commit-

> Once you get out of the Great Lakes, you find that the IJC doesn't have much of a profile.

tees. Meetings with officials from the Army Corps of Engineers, the Environmental Protection Agency, state departments of natural resources and the Great Lakes Fisheries Commission were among those mentioned by another American commissioner.

If insecurities concerning the IJC's budget were shared on the Canadian side, they certainly were not expressed. On the U.S. side, however, they were mentioned by a couple of commissioners. One went so far as to state that possible budget cuts were a real concern during their term, when "There were some feelings that we were becoming an environmental commission to the detriment of our water role," and "There was a sense in the Senate that the IJC was getting out ahead of issues."

On the Canadian side, at least one former chair was of the belief that the IJC should not meet with government officials, on the grounds that this would in some way compromise its independence. This view was not shared by his U.S. counterpart at the time. On the other hand, another Canadian commissioner reported meeting often with government officials, including at the highest levels. The personal style and status of an IJC national section chair appear to be factors determining the nature and frequency of interactions with officials from other parts of the state.

On both national sides of the IJC, though more vocally from the American side, commissioners who were not section chairs expressed some frustration that the opportunities available to them to be more involved in the Commission's activities, including interaction with officials from other parts of the government, were too few. "A shortcoming of the current model," said one American commissioner, "is that it is at the discretion of the chair when and how the other commissioners are involved.... Given the broadening of the IJC's activities," this commissioner added, "the other commissioners should be more involved."

The question of how visible the IJC is, if not among the general public of the two countries, then at least among policy-makers and opinion-leaders in the environmental field on both sides of the border, might be seen as an indirect and admittedly very imperfect measure of the Commission's influence. Only one commissioner did not express some significant doubts about the IJC's importance as an institutional player in the process of transboundary environmental governance. "I'm not so sure that we were always supposed to be relevant," said one American commissioner. "Once you get out of the Great Lakes you find that the IJC doesn't have much of a profile," observed a Canada member. At least two commissioners, both on the American side, used the terms "providing political cover" and "legitimization" for some of what the IJC was expected by government to do. Another U.S. commissioner declared, "The IJC is more important in Canada, where it's seen as an instrument of policy in dealing with the United States on environmental issues. It just isn't on the radar screen outside the Great Lakes region in the U.S."

A somewhat different observation about the perceived relevance of the IJC was made by another American commissioner who expressed the view that the "radicalization" of the Commission during the years when a ban on industrial chlorine discharges was high on the environmental agenda had contributed to the marginalization of the IJC. This episode in the Commission's history left a legacy, the commissioner argued, of the IJC being perceived as a bit of a "loose cannon" by officials within the American government.

Every positive assessment of the IJC as a model for the binational resolution of transboundary issues emphasizes the Commission`s tradition of consensus decision-making. Officially, at least, Canadian and American commissioners have hardly ever found themselves on opposite sides of the fence. A 2006 presentation made by former American section chair Dennis Schornack included a striking slide showing that in only 2 percent of all cases resolved by the IJC did the commissioners split on national lines (Schornack: slide 2)

It is hard to argue with a 98 percent success rate. But interviews with the commissioners quickly reinforced a point made in some of the secondary literature on the IJC: matters that are considered too contentious or too important simply are not assigned to the commission. In the words of one American commissioner, "Neither government really trusts the IJC." Another American commissioner, speaking of references to the IJC, said that "they are only used when the governments know pretty much what the answer will be." When the recom-

mendations of the Commission do not accord with the preferences of one or another government, as happened in the Lake Champlain reference, "We were told that we were out of line. Governments aren't going to give up power to an independent-minded body if there is a risk of not liking the decision."

This same U.S. commissioner went even further in criticizing of the IJC's ability to carry out what he/she believed to be its functions. "We're supposed to prevent and resolve disputes," the commissioner said, "But we have never prevented anything. We haven't had a history of anticipating, but this is what we need to do and are trying to do now." The political background of this particular commissioner made him/her especially sensitive to the practical obstacles in the way of Canada-U.S. agreement on contentious transboundary water issues.

Several of the commissioners emphasized quality scientific information as the basis for binational cooperation and agreement on the consensus. A couple of commissioners, one from each national section, specifically mentioned the "solemn declaration in writing" that IJC commissioners are obliged to undertake, requiring that they impartially perform the duties imposed upon them under this treaty as a factor that encouraged binational consensus. No one criticized the consensus model of decision-making that is the hallmark of the IJC. But several commissioners identified limits on its effectiveness.

One of these limits involves differences in national values and interests. Several commissioners expressed the view that differences in the outlooks of Canadian and American commissioners sometimes came down to culture. This point is made by former U.S. section chair Gordon Durnil in *The Making of a Conservative Environmentalist*:

> *The first principle is for the Commission to act as a binational fact-finding body rather than one which works as two separate national sections with individual national interests and agendas. It is a principle easier said than done, and easier for Canadians than Americans. Americans like to tell Canadians, "You are just like us." The American thinks that he or she has just offered the highest of compliments. The Canadian thinks that he or she has just been insulted. There are differences in the cultures of Canadians and Americans. We are not the same. (Durnil: 24)*

A couple of Canadian commissioners echoed this point about the existence of a sort of "continental divide" between commissioners from the two countries. "There are differences," said one Canadian commissioner, "We tend to be more progressive in Canada, even our businessmen are more progressive than American businessmen." Another Canadian commissioner ventured the opinion that "the American commissioners perhaps operate more based on their own national interests." One American commissioner expressed the view that, at least during their time on the Commission, "The Canadian approach is more centralized than ours," an observation that former commissioner Durnil also makes in his book (Durnil: 25). This view was echoed by another U.S. commissioner who observed that "everything becomes the responsibility of local governments eventually" and who believed that much of the IJC's work should be focused on local governments and regional authorities where the implementation of water policy is managed.

Several of the commissioners mentioned the importance of personalities on the IJC, particularly those of the national section chairs, as crucial to the effectiveness of the Commission's consensus model. It is clear from what little third party information exists that leadership styles have varied between chairs, but also that a serious clash of personalities or leadership styles has seldom been a problem—although it did appear to impede the Commission's work at one point in the IJC's history. One Canadian commissioner noted that under the leadership of a particular Canadian section chair the Canadians would caucus separately, "giving the Americans time to think." This commissioner expressed the view that ideology and nationality had mattered much less during his/her time on the Commission than the personalities of the commissioners. Interestingly, however, at least one Canadian and one American commissioner mentioned this particular colleague as being rather "parochial" and overly concerned with acting as a spokesperson for perceived regional interests that the commissioner represented.

One of the American commissioners expressed the view that Canadian members were more sensitive than their American counterparts on the issue of water outtakings from the Great Lakes and that issues involving the effects of dams were always damnably—apologies to Bill Lowry!—divisive. "Sometimes we would just put matters aside if things got too contentious," he observed.

In recent years much of what the IJC does has

involved communicating with the public and organized interests on the increasingly broad range of transboundary issues that it studies and on which it makes recommendations. "We can talk to anyone," said one Canadian commissioner. At certain points in the IJC's history its interactions with organized interests have been intense and not always amicable. Gordon Durnil has written about the very strained relations that existed between the IJC and representatives for businesses that relied on the use of chlorine in their industrial processes. But at least one American commissioner expressed the view that during their term, "Business representatives understood the need for compromise and ultimately were easier to talk to than environmental groups." Another U.S. commissioner expressed the view that the IJC appeared to American politicians—he/she was, presumably, talking mainly about conservative politicians—to have become "captured" by the environmental movement in the 1980s and 1990s. "I don't see myself as representing either industry or environmental groups," the commissioner said, adding that government's willingness to use the IJC had probably been damaged by the perception that it had become a champion of the environmental movement. Another commissioner, also an American, remarked on what he/she perceived to be the political naivety of the scientific experts with whom the commissioners regularly interact.

Canadian commissioners had comparatively little to say about the IJC's relations with industry and environmental interests. One commissioner who did not serve as chair said that they did not sense that the IJC had much in the way of direct dealings with such groups, but that the Ottawa office of the IJC might have greater interaction than he/she was aware. Another Canadian commissioner spoke mainly of interlocutors in the public sector, giving the impression that direct meetings and contacts with industry and environmental groups were neither frequent nor particularly important to the IJC's functioning.

CONCLUSION: CONVERGENCE, DIVERGENCE OR SUBMERGENCE?

The original expectations held for the IJC by at least some of those who had a hand in its creation were that it would help to overcome the different interests of Canada and the United States on the management of shared water resources and perhaps even perform a broader role in the resolution of transboundary disputes between the two countries. The structure of the IJC and its tradition of binational consensus decision-making accord with this vision of convergence. But the record shows that the tug of different national interests and outlooks has sometimes proved to be insurmountable and that the likelihood of the IJC being expected or able to reconcile these differences, acting as the impartial arbiter that Elihu Root hoped it would become, is rather low in such cases. This does not mean, of course, that the IJC becomes irrelevant when the gap between national differences is wide and the stakes are high. It is to say, rather, that the IJC is capable of playing only a limited role in such circumstances, and that its influence will depend ultimately on the two governments' willingness to use the Commission as a venue for decision-making. Interviews with some past and present commissioners corroborated the importance of the factors that contribute to divergence between national sections of the IJC, divergence that is most easily overcome when the Commission is engaged in activities that fall short of rendering binding decisions or recommendations on issues where the two national governments have staked out different positions.

> "Influence will depend on its member governments' willingness to use the commission as a venue for actual decision-making and actionable results.

It may be, however, that one of the most important limitations on the IJC as an institution for transboundary environmental governance involves the proliferation of other institutions and processes for the management of cross-border environmental issues. Although this proliferation has not been a focus of this chapter, it is discussed in some of the other chapters of this volume. As the playing field of actors involved in studying, advocating and regulating these matters has become more crowded, the IJC's voice has become just one, although with a claim to being the most venerable, among many. Fifty years ago a study of transboundary environmental governance between Canada and the United States would have been essentially about the role of the IJC. That might even have been true thirty years ago. It is, however, no longer the case. Submergence under a tide of competing cross-border processes and institutions has been an important factor contributing to what surely is a less prominent role for the IJC today than some expected and predicted one hundred years ago. We will return to this theme in the concluding chapter.

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ANNEX 1: Questions for IJC Commissioners

1. Do you recall when and how you learned that the government/administration wanted to nominate you to the IJC? Had you requested this position? (If yes, then why. Whether yes or no, why do you think the government chose you for this post?)

2. Did you know much about the IJC, the boundary waters treaty or environmental policy at the time of your appointment?

3. When you started at the IJC, how did you see your own role and that of the commission? I mean, did you start out with a set of goals or a sense of the direction in which the IJC should go, or were these things that learned while on the job? Where did these goals or sense of direction come from? Who or what was most influential in your on-the-job learning at the IJC?

4. During your years as a commissioner what other government agencies or departments did the IJC interact with most? What about Congress/Parliament and its members and committees?

5. Was it ever your sense that the IJC had a visibility problem within the policy-making community; that it just wasn't central enough or often enough on the radar screen?

6. The IJC is the original binational Canada-U.S. insti-

tution and talking to commissioners I know that they are proud of the track record of cooperation. But were there ever occasions when you felt that U.S. and Canadian commissioners were on different wavelengths, representing different points of view or responding to different interests?

7. I know that as a commissioner you may have had extensive dealings with environmental and industry groups. Were some groups easier to deal with than others? (Elaborate.)

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The current water management regimes along the shared transboundary rivers of the United States and Canada were established under the International Boundary Waters Treaty (IBWT) of 1909. Prairie rivers tend to fluctuate between scarcity and flooding, and successful attempts to dam, store, and internationally apportion river flow were forward thinking at the time and contributed to the region's economic development and political stability. But now many Prairie rivers have reached a point of full allocation and this same water supply is threatened by global climate change. New interests have emerged and sought to reframe water management priorities to support environmental concerns. The very institutions that once contributed to this region's economy now threaten to undermine its stability by too strict adherence to the status quo. The region faces the challenge of accommodating environmental protection and preservation within the existing IBWT framework. The outcome could shape the Prairie political economy—in good ways or bad—for the next century or longer.

Chapter 3: Managing Water Scarcity in the Prairie Region: The Role of the IJC in a Changing Climate

B. TIMOTHY HEINMILLER
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The shared boundary waters of North America span a number of diverse natural regions. While the 1909 International Boundary Waters Treaty (IBWT) created a unified set of governance principles for all boundary waters, this framework has been adapted and expanded by the member governments and the International Joint Commission (IJC) to meet the unique water challenges of each distinctive border region.

In the Prairie border region, characterized by scarce and highly variable water supplies, transboundary rivers have long been an important source of water for irrigators and urban riparians, and the water management rules developed within the framework of the IBWT clearly reflect this.

While international apportionment and management of the St. Mary, Milk, and Souris rivers have greatly contributed to Prairie agricultural development, this political economy is also predicated on a water supply that is threatened by global climate change. Water supplies are almost fully allocated in the region, and although current institutions have created a relatively stable equilibrium amongst water users, a steep decline in water supplies could throw this into disarray. Many experts predict that the Prairie region, which is naturally semi-arid, will have even less water in the future. This could pose a major threat to the viability of current agricultural patterns and the institutions that have enabled them.

This article examines the substantial contributions of the IBWT and IJC to the development of the Prairie political economy over the past century and considers whether this political economy will be sustainable as the region faces increased water scarcity due to global climate change.

THE TRANSBOUNDARY RIVERS OF THE PRAIRIE REGION

Unlike most other regions of the Canada-U.S. border, which have abundant water resources, the Prairie region is characterized by a scarce and highly variable natural water supply. Surprisingly, given the region's reputation as one of the world's agricultural breadbaskets, its average annual precipitation is between 300 and 500 mm, and less in some places (Matthews and Morrow Jr. 1985:38). This makes the Prairies a somewhat marginal area for dryland agriculture, despite vast stretches of fertile land.

The Prairie region's main source of water is found in the few rivers of relatively modest size that transect the landscape. Farmers have come to rely heavily on these rivers for stock watering and agricultural irrigation; the latter is by far the largest use of water in the region. Managing the Prairie rivers to facilitate large-scale irrigation is a pervasive challenge, although not the only one.

Prairie residents must also cope with highly variable and sometimes wildly erratic river flows. In fact, Prairie residents often describe their rivers as "either mud or flood," reflecting a situation of general scarcity punctuated with occasional flooding. Annually, river flows are usually highest in the spring during the winter melt and lowest in the late summer and fall, but periodic spikes in river flow due to extreme weather events are common and can result in severe flood damage to riparian properties.

In the region there are three major rivers that cross the international boundary and are managed by the IJC on an ongoing basis: the St. Mary, the Milk, and the Souris. However, the St. Mary and Milk rivers are generally treated by the IJC as a single river system since they are hydrologically connected by a diversion canal in northern Montana.

In addition to these three rivers, several smaller creeks cross the international boundary. Although the IJC has been involved with these tributaries, it has not developed any river-specific management rules.

As described, the St. Mary, the Milk, and the Souris are characterized by water scarcity and flooding and their variability of flow presents water management challenges quite distinct from neighboring river basins to the east and west. In the West, over the Rocky Mountains, the Columbia is the main transboundary river, and though it has many management challenges, scarcity is not one of them. To the east, the Red River flows through some Prairie lands and has perennial flooding problems, but this area has both more water and less irrigated agriculture compared with its western Prairie counterparts. Consequently, the Red River's management challenges differ in kind from those on the St. Mary, Milk, and Souris rivers, and it is not included in this discussion of Prairie rivers.

> "Prairie agricultural development is predicated on a water supply that is threatened by global climate change.

St. Mary River

The westernmost river in the Prairie region, the St. Mary originates in the Rocky Mountains of Glacier National Park in Montana. From there it flows northward into Alberta, where it joins with the Oldman River to form the main stem of the South Saskatchewan River. The St. Mary is by far the largest of the transboundary Prairie rivers and has the least variable flow (Halliday and Faveri 2007:77). Its main source is glacial melt in the Rocky Mountains, which provides a more dependable and stable flow compared with the surface runoff on which the Milk and Souris rivers depend.

Milk River

The Milk River originates as run-off in the Montana foothills and has a much lower average annual flow and much higher flow variability than the St. Mary (Halliday and Faveri 2007:77). The Milk, part of the Missouri River system that drains through the Mississippi River into the Gulf of Mexico, is also unusual in that it starts in Montana and flows northward into southern Alberta for about 200 km before arching southward to return to Montana.

At various points, the St. Mary and the Milk are in close proximity to each other, and, over the first two decades of the 20th century, the U.S. Bureau of Reclamation constructed a canal to connect the St. Mary to the Milk, thus diverting the St. Mary's more abundant flow to support irrigation in northern Montana. International controversy over this project proved to be one of the precipitating factors in the negotiation of the IBWT, and the canal has since linked the two rivers both hydrologically and institutionally in an IJC water management regime.

Souris River

Unlike the Milk, the Souris River lies in the same drainage basin as the St. Mary. Both are part of the Saskatchewan-Nelson Basin that eventually drains into Hudson Bay. Despite that, the two rivers are geographically distinct. The Souris has its source in southern Saskatchewan and runs southward into North Dakota before arching northward and re-entering Canada in southern Manitoba and merging with the Assiniboine River.

The Souris is fed almost entirely from surface runoff. Due to the inconstancy of its source, the river is characterized by flows that are relatively low and highly variable. Sometimes the Souris is reduced to barely a trickle and other times is so swollen that it bursts its banks (Hood 1994). Governments on both sides of the border have gone to considerable effort and expense to try to bring the basin's flows under control, and an IJC water management regime has been a key element of that attempt.

While the St. Mary, Milk, and Souris rivers have been subject to international management regimes under the auspices of the IJC, a number of other transboundary rivers in the Prairie region have not. Many of these rivers and creeks seemed too small or underutilized to warrant the investment of time and political capital that would be necessary to develop specific management regimes. Yet even in the absence of river-specific management regimes, the general principles of the IBWT have still been applied to the use of these rivers. As a result, they have been subject to a substantial level of international involvement. For example, the IJC was involved in resolving international disputes on Sage Creek (shared by Alberta and Montana) and Poplar Creek (shared by Saskatchewan and Montana) in the late-1960s and mid-1970s, respectively (Jordan 1974:532; Hood 1994:27-28).

> "If the Prairie region's transboundary rivers present management challenges, they also provide incentives for productive international cooperation.

The Waterton and Belly rivers, which rise in Montana and flow into Alberta, where they eventually join the St. Mary River, are the largest rivers in the Prairie region that do not have river-specific management regimes. This situation is not for lack of trying. In the 1950s, the IJC was asked to investigate and recommend a regime for these rivers, but the commissioners could not come to agreement and split along national lines, submitting separate reports to their respective governments. This is the only time in the history of the IJC that such a split has occurred. No subsequent attempt to develop water management regimes for the Waterton and Belly, has been undertaken (Willoughby 1981:37).

If, by their very natures, the Prairie region's transboundary rivers present management challenges, they also provide incentives for productive international cooperation. Given how these rivers meander back and forth across the border, neither the United States nor Canada is an exclusively upstream or downstream jurisdiction. Canada is a downstream jurisdiction on the St. Mary River, but upstream on the middle section of the Milk River and the upper section of the Souris River. These unusual patterns and alternating upstream-downstream relationships have created something of a natural balance of power between the two countries. Each country knows that if it exploits its upstream advantage to the detriment of the other, there could be retaliation on another river—or even on a different reach of the same river. This natural landscape has given rise to a much different political dynamic than exists, for example, between the United States and Mexico. On that border, the United States consistently is the upstream jurisdiction and has exploited this advantage to full effect (Reisner 1993:463-465).

WATER AND THE PRAIRIE POLITICAL ECONOMY

Since the first arrival of white settlers in the nineteenth century, the political economy of the Prairie border region has been shaped fundamentally by the scarcity and variability of water supplies. Agriculture has been the dominant economic activity in many parts of the region. Water management has played a critical role in Prairie agriculture, both for irrigation and stock watering, though the former uses far more water and has a much bigger impact on the environment than the latter.

Cities and industries in the region also tended to locate along its relatively few major rivers. As these riparian interests developed, they became subject to severe damage and dislocation from periodic flooding of Prairie rivers. Together, the riparians and irrigators shared a fundamental interest in trying to control Prairie rivers through damming and water storage. Riparians sought control to prevent flooding during high flows and farmers sought greater dependability—through artificially manipulated water storage and delivery—during low flows.

The interplay between water and the region's economic interests are reflected in the differing meanings of the term "conservation" in the Prairies versus the more water-abundant regions to the east. In the East, to "conserve" water is to minimize usage so that much of it is left in the natural environment. In the Prairies, "conserving" water means controlling, storing, and using it before it is lost to the environment. Water was regarded as such a scarce and valuable resource that it should not be wasted by leaving it in a stream where it is not utilized.

Along with their shared stake in water control, farmers and riparians also generally agreed that most water in the Prairie region should be utilized for beneficial use, defined as use that contributes some kind of economic benefit. The acceptance of control and beneficial use was almost universal amongst the early interests involved in developing the Prairie region. As a result, water management was cast as a "development" issue rather than one concerned with environmental preservation and/or protection. Most often, when water controversies arose, they were not about whether the Prairie rivers should be developed, but about how the costs and benefits arising from development would be distributed amongst the relevant parties (Worster 1985: Reisner 1993).

Yet as control and beneficial use became widely accepted as the basic goals of water management in the Prairies, the transboundary nature of some of the most important rivers in the region arose as a serious complicating factor. The international border divided agricultural and riparian interests on national grounds, creating political rivalries that threatened to swamp progress towards their mutual water development goals. And at certain critical junctures, local water development issues became highly politicized and escalated into international conflicts involving both federal governments.

"Water was regarded as such a scarce and valuable resource that it should not be wasted by leaving it in a stream where it is not utilized.

An early example of this was the St. Mary's Canal controversy at the start of the 20th century. In 1902, at the behest of agricultural interests along the Milk River, the U.S. Bureau of Reclamation investigated and in 1905 received approval from the U.S. Congress for the construction of a canal to divert water from the St. Mary River to the Milk. However, the Canadian government protested the canal's construction and, after having its protests ignored, threatened retaliation by approving its own project that would have diverted water from the Milk River back to the St. Mary within Canadian territory (Simonds 1999). In all of this, the mutual interests of farmers and riparians on both sides of the border were overwhelmed by international rivalry and progress in water development was stalled.

All parties gradually came to realize that what was needed was some sort of institution to manage and resolve international disputes of this nature. The controversy over the St. Mary Canal was one of a number

of transboundary water disputes which brought the U.S., Canadian, and British governments to the negotiating table, eventually resulting in the IBWT in 1909 (Dreisziger 1981).

The treaty's Article VI specifically addressed the management of the St. Mary and Milk rivers, creating the first international river management regime in the Prairie region. And even more important was the creation of an international forum—the IJC—where transboundary river management disputes could be investigated and settled, and new river management rules could be negotiated. For farmers and riparians on both sides of the border, the creation of the IJC was a major boon as a forum in which international rivalries could be contained and their common interests in water control and beneficial use could be recognized and pursued.

And since its creation, the IJC has promoted the interests of farmers and riparians in river management regimes for the major transboundary Prairie rivers. International rivalries have persisted, sometimes resulting in awkward political compromises, but agricultural and riparian interests have become well entrenched within the international management regimes for both the St. Mary-Milk and the Souris. Three characteristics of these regimes reflect these interests most clearly and are discussed more thoroughly below:

- Inter-jurisdictional water apportionments allow governments to plan their water development and grant private entitlements to agricultural and riparian water users.

- Drought and flood provisions permit modification of the apportionments to ensure that agricultural and riparian water users will be able to cope with extreme water events.

- Intergovernmental river management boards administer the apportionments and head off disputes.

Inter-jurisdictional Water Apportionments

The St. Mary's Canal controversy in the early 1900s created uncertainty for irrigators and governments in the St. Mary and Milk basins about the permanence of their water supply. This uncertainty was a major barrier to irrigation development because few people wanted to invest in the construction of irrigation systems without assured water supplies. To help remedy this, one of the main features of Article VI of the IBWT was an apportionment of the waters in question (IBWT, 1909):

> *The St. Mary and Milk Rivers and their tributaries…. are to be treated as one stream for the purposes of irrigation and power, and the waters thereof shall be apportioned equally between the two countries, but in making such equal apportionment more than half may be taken from one river and less than half from the other by either country so as to afford a more beneficial use to each.*

Article VI also recognized that the United States had a prior appropriation of 500 cubic feet per second (or three-quarters of the natural flow) from the Milk River and that Canada had a prior appropriation of 500 cubic feet per second (or three-quarters of the natural flow) from the St. Mary River, reflecting the areas in each country where large-scale irrigation was planned or had already begun (IBWT, 1909). In effect, the two countries agreed to share the St. Mary and Milk rivers equitably in aggregate, but provided Alberta with a larger, prioritized share of the St. Mary and Montana with a larger, prioritized share of the Milk. This trade-off allowed both jurisdictions to accelerate their irrigation development.

While the apportionment in Article VI created enough water supply certainty to facilitate substantial irrigation expansion, differing interpretations of the apportionment forced the IJC to clarify it shortly after its introduction. The disagreement centered primarily on the locations at which the apportionments should be measured and the protocol for determining how the river would be equally apportioned, after each country's prior appropriation had been met.[1] Starting in 1915, the IJC held a series of hearings on the matter and, in the irrigation seasons of 1918 to 1921, issued provisional orders specifying the water entitlements of each country (Halliday and Faveri 2007:81).

The disagreement on Article VI's interpretation was a critical early test of the legitimacy of the IJC and, for a time, the U.S. government threatened to ignore any imposed settlement. But the commissioners persevered and engaged local irrigators to determine what apportionment arrangements would suit their needs (Willoughby 1981:28). In October 1921, the Commission issued an order containing a judicious apportionment compromise crafted by accepting the American position on the location of apportionment

measurement and the Canadian position on the protocol for equal apportionment (IJC 1921; Halliday and Faveri 2007:81). Despite some continued protests from the Montana government, which brought the issue before the IJC again in 1928, 1930, 1931 and 1932, these apportionment rules prevailed (Willoughby 1981:29). Although fully satisfying no one, the rules have proven adequate to almost everyone, providing international stability and the water supply security needed to facilitate irrigation development in the St. Mary and Milk basins.

In the Souris basin, the issue of water apportionment did not arise until the late 1930s, but international apportionment rules were also put in place at the behest of agricultural and riparian water interests. By the late 1930s, North Dakota had undertaken dam construction and irrigation in its portion of the Souris, while Saskatchewan was only beginning its development. In 1940, the IJC was asked to recommend an international apportionment for the basin. However, the Commission, citing inadequate river flow data, recommended only an interim apportionment that approximated levels of existing water use (Hood 1994:14-19).

Saskatchewan saw this apportionment as detrimental to its interests, because it effectively froze water development at current levels, to the advantage of North Dakota. Consequently, the Saskatchewan government lobbied for, and attained, a new interim apportionment in 1959 that allowed Saskatchewan and North Dakota to each use 50 percent of the natural flow originating within their respective borders while allowing the other 50 percent to pass to their downstream neighbors (Hood 1994:16-19; IJC 1959). Amendments in 1992 and 2000 placed a number of conditions on these apportionments (discussed further below), but this basic 50/50 split remains the defining feature of inter-jurisdictional apportionment on the Souris.

> "The IJC was a major boon as a forum in which international rivalries could be contained and their common interests in water control and beneficial use could be recognized and pursued.

Throughout the Prairie region, inter-jurisdictional river apportionments have been central to water development, providing each jurisdiction with enough security of water supply to facilitate the widespread distribution of private water rights. Beneficial use has been the defining principle of water rights distribution in all five Prairie jurisdictions. There have, however, been substantial inter-jurisdictional differences in water entitlement systems.

In Montana and North Dakota, water rights were distributed primarily through prior appropriation, utilizing the "first in time, first in right" principle. Under the prior appropriation system, anyone who could put a volume of water to beneficial use could claim a right to it, but had to maintain this beneficial use or risk losing this right to a new claimant (Worster 1985:108; Tarlock 2001). The "first in time, first in right" and beneficial use principles were also adopted in the Canadian Prairies, though ownership of all water in the region was vested in the Crown by the *Northwest Irrigation Act* of 1894. As a result, in addition to proving beneficial use, Canadian water rights claimants had to seek government permits in order to formalize their claims (Percy 2005).

Over the intervening decades, all Prairie jurisdictions have modified and added to their initial prior appropriation and prior allocation systems, Saskatchewan and Manitoba making the most radical reforms. And yet the principle of beneficial use has been largely preserved throughout the region and remains a defining feature of the Prairie political economy.

Drought and Flood Provisions

Apportionment rules contribute greatly to water supply security, but they inherently assume a "normal" level of water flow that can be divided amongst water users. Yet, because water flows in the Prairie region are highly variable, there are many years in which the "normal" level of supply is not available and water users are subjected to either drought or flooding. Extreme water events, while periodic, are a major threat to the riparian and agricultural water users of the Prairies. It may only take one drought or one flood to put their livelihoods or property in jeopardy. Consequently, the IJC's water management rules in the Prairie region have been supplemented with provisions that modify the appor-

tionments in extreme conditions. These drought and flood provisions are designed to allow agricultural and riparian interests to cope with these conditions until "normal" flows resume.

In addition to providing water security for established users, these drought and flood provisions have had an impact on the political economy of the Prairie region in other ways. They have reduced the level of risk involved in more marginal agricultural and riparian water uses, encouraging their development and facilitating the pursuit of beneficial use of the water resources in the region.

In the St. Mary-Milk Basin, irrigation is the dominant water use and the primary concern of irrigators has been drought protection. In the negotiation of Article VI of the IBWT, it was accepted that the "normal" natural flow of both rivers was around 666 cubic feet per second during the irrigation season. Canada was given a prior appropriation of 500 cubic feet per second on the St. Mary and the United States was given a prior appropriation of 500 cubic feet per second on the Milk; in both cases these apportionments were considered to be three quarters of each river's presumed natural flow (IJC 1921). In low flow periods—when flows were less than 666 cubic feet per second—this apportionment posed the danger that the party with the lesser interest on each river could be partly or entirely deprived of water as the other country exercised its prior appropriation.

The prior appropriations were designed to protect each country's major irrigation areas in the region. However, the few remaining interests left at risk by this arrangement quickly voiced their concerns. The outcry brought about new provisions in the form of the 1921 IJC Order offering drought protection. When flows in either the St. Mary or the Milk drop below the "normal" level of 666 cubic feet per second, the prior appropriations are transformed from three-quarters of natural flow (500 cubic feet per second) to three-quarters of actual flow, which varies depending on the severity of the drought (Halliday and Faveri 2007:81). As a result, at least one-quarter of actual river flows always goes to the non-prioritized jurisdiction on each river, helping irrigators in these jurisdictions survive drought periods until "normal" flows resume.

On the Souris River, flooding is at least as great a concern as drought. The international apportionment rules have been modified to protect riparian and agricultural interests from both extremes.

> "Inter-jurisdictional river apportionments have been central to water development, providing each jurisdiction with enough security of water supply to facilitate the widespread distribution of private water rights.

For flood protection, the most significant development has been the construction of the Rafferty and Alameda dams in southern Saskatchewan during the 1980s and early 1990s. Situated in the upper part of the basin, these dams offer flood protection to parts of southern Saskatchewan and northern North Dakota. A main beneficiary is the city of Minot, North Dakota, which had experienced flooding throughout its history, including a catastrophic flood in 1969. In fact, North Dakota stood to benefit so much from the Rafferty and Alameda dams that the United States contributed more than $40 million to their construction (Hood 1994).

However, the dams changed the hydrological context of the existing 50/50 apportionment. Saskatchewan could now lose a significant part of its apportionment through evaporation from the Rafferty and Alameda reservoirs, while doing so for the protection of North Dakota riparians. Accordingly, in 1992, the apportionment rules were modified (IJC 1992):

> *Under certain conditions, a portion of the North Dakota share will be in the form of evaporations from Rafferty and Alameda Reservoirs. During years when these conditions occur, the minimum amount of flow actually passed to North Dakota will be forty percent of the natural flow at the Sherwood Crossing.*

This new 60/40 apportionment is limited to relatively wet years in which there is both an adequate natu-

ral flow at the international border (the Sherwood Crossing) and the level of Lake Darling in North Dakota is at a minimum specified level. A more intricate set of compromises among the governments and users of the Souris is difficult to imagine. Yet the new flood and drought provisions work to ensure that both Saskatchewan and North Dakota riparians enjoy the flood protection of the Rafferty and Alameda dams but that Saskatchewan has the opportunity to build up its water storages in relatively wet years, when the 60/40 apportionment comes into effect. In contrast, during relatively dry years, when they need it most, North Dakota irrigators are assured of their traditional 50 percent share of the Souris.

Intergovernmental River Management Boards

Intergovernmental river management boards have been crucial to the preservation of these elaborately constructed international water management rules. In shared resources like the Prairie transboundary rivers, the management rules themselves constitute a public good that, although highly valued by many, is inherently vulnerable to the free-riding and defection challenges that characterize all public goods (Ostrom 1990:38-49). These challenges can be particularly acute in an international context where there is no sovereign figure to ensure or enforce compliance (Heinmiller 2007).

The IJC's solution was to create bodies with a mandate to administer established river management rules, monitor rule compliance, and resolve minor disputes. These intergovernmental river management boards are binational in membership and often involve representatives from relevant state and provincial governments, thus establishing informal inter-jurisdictional networks and trust ties that further circumvent the public good problem. Involved as they are in day-to-day apportionment implementation tasks, these intergovernmental authorities have become the face of transboundary river management in the Prairie region and one of the guarantors of the established political economy. The St. Mary-Milk was one of the first shared basins to have an IJC-created river management body, but its organizational design was somewhat atypical of the many river boards that followed. Its origins can be traced to Article VI of the IBWT which allowed the IJC to direct a designated reclamation officer from the United States and a designated irrigation officer from Canada to work cooperatively in the measurement and apportionment of the St. Mary-Milk waters (IBWT 1909). The responsibilities of these officers were further expanded and elaborated in the 1921 IJC Order (IJC 1921). No formal management board was created and to this day, the intergovernmental authority on the St. Mary-Milk basin remains known as the "Accredited Officers." Functionally, its role in rule administration and dispute resolution is at least as important—if not more so—as the more formalized IJC boards in other transboundary basins.

In their administrative activities, the Accredited Officers are guided by the "Administrative Measures" which "form the basis for calculating the natural flow and determining each jurisdiction's performance in meeting the specifications of the Order" (Halliday and Faveri 2007:85). While the Administrative Measures provide a common protocol for apportionment implementation, they also allow the Accredited Officers some latitude to resolve minor issues before they become major disputes. For example, they can resolve differences concerning "balancing periods," the duration of time over which water diversions are measured and accounted for to ensure they are in compliance with apportionment rules. In the St. Mary-Milk basin, the standard balancing period is 15-16 days. Typically, apportionment deficits in one balancing period are made up in the next balancing period, although "this practice has been varied to enhance beneficial use" (Halliday and Faveri 2007:87). In such difficult circumstances, the Accredited Officers have been successful in implementing these types of selective apportionment while maintaining the fundamental integrity of the rules themselves.

In the Souris Basin, IJC river management boards have played a similarly important role in the region's political economy. The first such board was created in 1948 and was known as the International Souris-Red Rivers Engineering Board. This board was mandated "to report on the use and apportionment of the waters within the Souris, Red, Poplar, and Big Muddy river basins and to develop plans of mutual advantage for these waters" (IJC 2007). However, once a universally accepted apportionment of the Souris was reached in 1958, the activities of this board were eclipsed somewhat by the new International Souris River Board of Control, which had responsibility for monitoring the apportionment's implementation.

The two boards coexisted for a number of decades until 2002, when all international administrative responsibilities for the Souris were consolidated in the new International Souris River Board. The cur-

rent board has 10 members, five Canadian and five American, including representatives from the Saskatchewan, Manitoba, and North Dakota governments. In their various manifestations, all these boards have played a key role in allowing the governments and users of the Souris to put these scarce and highly variable waters to beneficial use. The Souris' interim apportionment rules, for example, establish that flow releases from Canadian dams should be scheduled to approximate natural flow patterns and to allow for "beneficial use" in North Dakota. The Souris River Board is then tasked with the application of these general principles and the reconciliation of any contradictions between them (IJC 1992). Thus far, it has proven quite adept at this task and the fundamental integrity of the Souris apportionment has been maintained.

CHANGING PERCEPTIONS AND PRIORITIES AND THE POTENTIAL IMPACT OF CLIMATE CHANGE

Longevity and stability have been key to the success of the Prairie river management regimes. However, now these institutions' longevity—and the fact that they adhere to the priorities of a much earlier era—may be contributing to an erosion of public support.

Overall, the regimes devised for the St. Mary-Milk and Souris basins have clearly reflected and advanced the development interests of farmers and riparians who were dominant in the Prairie political economy at the time of their creation and for decades afterward. And while these management regimes, and the various state and provincial water entitlement regimes interlinked with them, have fundamentally institutionalized the objectives of control and beneficial use in Prairie water management, the underlying social consensus supporting these objectives has begun to erode.

As the Prairie political economy has evolved, new interests have emerged who do not value control and beneficial use in the same way as irrigators and riparians. Among other things, they have sought to reframe water management priorities to support environmental rather than developmental concerns.

Many of these new interests, which include Aboriginals, environmentalists, and recreational fishers and boaters, among others, value the Prairie rivers in their natural state and reject the premise that control and beneficial use should be the primary objectives of Prairie water management. Since the late 1960s, this group of interests has steadily gained in size, organization, and political influence, staunchly—if not always successfully—resisting attempts to expand control and beneficial use through further dam construction. The substantial and protracted resistance to the construction of the Garrison Diversion in North Dakota, the Oldman Dam in Alberta, and the Rafferty and Alameda dams in Saskatchewan are vivid illustrations of this bloc's concerns and attempts to influence water management in the region (Reisner 1993:187-93; Glenn 1999; Hood 1994).

As Aboriginals, environmentalists, and recreationalists have tried to recast Prairie water management according to environmental priorities, they have come up against an institutionally entrenched status quo defended by powerful vested interests. While some issues have been reframed successfully, major institutional reforms have been relatively rare. When environmental reforms have taken place, they have generally been in the form of "add-ons" to existing institutions. For instance, some minimum streamflows have been established and fish

"As the Prairie political economy has evolved, new interests have sought to reframe water management priorities to support environmental rather than developmental concerns.

and wildlife protections have been introduced, but they have been added to institutions still fundamentally designed to achieve control and beneficial use.

The accommodation of recent environmental protection measures with longstanding rules geared toward development remains awkward and incomplete within most Prairie water management institutions, including the transboundary river management regimes. For example, in the Souris basin, amendments enacted in 2000 now provide greater consideration and protection for the water needs of important fish and wildlife refuges in North Dakota. However, the essential elements of the apportionment remain unaltered and "beneficial use" remains one of the guiding principles for flow releases (IJC 2000).

One of the greatest challenges in the current Prairie political economy is the need to accommodate the more recent water management goals of environmental protection and preservation within the existing framework of institutionalized water management goals favoring control and beneficial use. The outcome of this political, conflictual, and incremental process will shape the Prairie political economy—in good ways or bad—for the next century or longer.

The ecological context for this debate has also changed significantly in recent years. The onset of global climate change—and urgency in forestalling that change—have become widely accepted and scientists have begun to work out exactly how climate change is likely to impact the Prairie region.

Prairie Transboundary Waters and Climate Change

After a century of management under the principles of control and beneficial use, many Prairie rivers have now reached a point of full allocation. Full allocation means that regulators have judged a river can support no additional consumptive use and, in some cases, the issuance of new water entitlements has been frozen. Along the transboundary region, full allocation has been reached in the Alberta portions of the Belly, Waterton, and St. Mary rivers, where "applications for any new allocation licenses are no longer being accepted" (Alberta Environment 2003:5). A similar situation exists on the Milk River, which the Montana government has closed to further development.

Even though full allocation was the long-term water management goal of many irrigators and water development enthusiasts in the Prairies, it has proven to be a somewhat precarious state of affairs for both water users and governments. One problem has been the creation of institutionalized periods of water shortage. When full allocation is reached on rivers with variable water flows, as is the case in the Prairies, the inevitable result is shortages during low flow periods. The Alberta government reports that water shortages are evident on the St. Mary River one of every 10 years, on average, and the Montana government reports that shortages are evident on the Milk River on average in six of 10 years (Halliday and Faveri 2007:84).

> "Major institutional reforms have been relatively rare and have generally been in the form of "add-ons" to existing institutions.

These persistent and recurring periods of shortage have a disproportionate impact on low-priority entitlement holders, and are therefore systematically creating disadvantaged groups who in turn are demanding more secure shares of scarce resources. This is true both domestically and internationally. Already there is evidence of substantial international discontent with the IJC river management regime for the St. Mary and Milk rivers, due, in large part, to recurring water shortages.

In 2003, Montana Governor Judy Martz began a campaign to have the IJC re-evaluate its 1921 Order for the St. Mary-Milk claiming that "the Order does not equally divide the waters of the two river basins, that circumstances today are different than before 1921, and that improvements are required to the administrative procedures that implement the Order" (Halliday and Faveri 2007:82). The IJC held public hearings in response to the matter in July 2004. Despite substantial public input from a wide variety of individuals and interest groups, no major changes to the Order or the Administrative Measures have yet been forthcoming (Halliday and Faveri 2007:82–87).

Environmental degradation is yet another consequence of full allocation. Recurring water shortages are

a fact of life under of full allocation, and these shortages not only have an adverse impact on low-priority entitlement holders, but also on the environment, which frequently is given the lowest priority of all. Prolonged water shortages can significantly damage riverine environments, destroying fish, fowl, and wildlife habitat and increasing the concentration of water pollutants.

For irrigators and other riparians, dam storages and releases can be used to mitigate low flow periods. However, most dams create water flow patterns that are much different than would exist in a natural state. Furthermore, the interruption and manipulation of natural flows creates its own set of environmental problems, including river channelization, interrupted fish spawning, and loss of native flora and fauna. Thus, even the existing efforts to mitigate recurring water shortages come at a substantial environmental cost.

The environmental damage wrought by full allocation in the Prairie transboundary rivers is evident in recent assessments by the U.S. Environmental Protection Agency (EPA). These data have been summarized in Table 1. Of the 23 river branches in the St. Mary-Milk and Souris basins assessed by the EPA in 2004, nine were designated as "good," six were designated as "threatened," and eight were designated as already "impaired" (Environmental Protection Agency 2004).

In this EPA study, a "good" assessment means the river branch supports all existing water uses, a "threatened" branch has water quality that supports existing uses but is declining, and "impaired" river branches are those whose water quality does not support one (or more) water uses. Between the two basins, the St. Mary-Milk was judged to be in the worst shape, which is not surprising given the higher level of irrigation development in the St. Mary-Milk and the state of full allocation that exists in much of this basin.

Given that full allocation has placed the Prairie political economy in a precarious position of recurring water shortages and environmental degradation, it is not unreasonable to speculate that within the context of global climate

TABLE 3.1: EPA Assessments of Environmental Health for Major Prairie Transboundary Rivers (2004)*

RIVER	NUMBER OF RIVER BRANCHES	GOOD BRANCHES	THREATENED BRANCHES	IMPAIRED BRANCHES	BRANCHES NOT ASSESSED
St. Mary River	1	0	0	1	0
Upper Milk	3	1	0	1	1
Lower Milk	6	0	0	3	3
Upper Souris	17	5	3	1	8
Lower Souris	23	3	3	2	15
TOTALS	50	9	6	8	27

Source: Environmental Protection Agency 2004

* In the EPA assessments, "impaired" river branches have water quality conditions that do not support one (or more) water uses, "threatened" river branches have water quality that supports all existing water uses but is in decline, and "good" river branches fully support all existing water uses. The EPA assessments are based on data provided by the state governments. (See EPA 2004a; EPA 2004b); Alberta Environment. South Saskatchewan River Basin Water Allocation. Alberta Environment, 2003.

change, this same political economy may become completely untenable. Most climate change models predict that as global warming accelerates, precipitation patterns will change and overall river flows will decline in the Prairie region. For instance, higher winter temperatures are predicted to cause more winter precipitation to fall as rain, rather than snow. And that would be highly problematic for farmers because much of the water will run off during the winter months when it can not be used, rather than remain as snowpack to feed the Prairie rivers during the spring melt, as now occurs naturally.

There also is concern that some of the Prairie rivers with sources in the Rocky Mountains, such as the St. Mary, will experience a long-term decline in river flows due to melting glaciers and reduced winter snows. Correspondingly higher summer temperatures, while increasing the potential growing season, will also increase evaporation rates, creating more demand for water just at the time when available water supplies are likely to be in decline (Bruce et al. 2003:19-28; Barnett, Adam and Lettenmair 2005:305). In summary, the median water supply on the Prairies is expected to decline as a result of climate change and the current state of full allocation may become a future state of severe over-allocation, even with no further growth in water allocations.

> "Recurring water shortages are a fact of life under full allocation, and can significantly damage riverine environments, destroying fish, fowl, and wildlife habitat and increasing the concentration of water pollutants.

THE NEXT CENTURY OF TRANSBOUNDARY WATER MANAGEMENT IN THE PRAIRIE REGION

The emerging question for Prairie water management is whether—and how—the current water management regimes, including the transboundary regimes, can be adapted to the changing climate. Growing pressures for such reform have already become evident in Montana's recent insistence on a review of the 1921 IJC Order. But the growing need for reform does not guarantee it will be initiated or meet with success. There are many political hurdles in the way of any major international reform effort.

The obstacles facing reform can be viewed more clearly using Paul Pierson's analysis of institutional resilience (Pierson 2004:142-153). Pierson argues that efforts to reform established institutions are often prompted by their dysfunctional effects, as seems to be true in this case with the recurrent shortages to low-priority users and the environmental degradation that has occurred.

General recognition of an institution's dysfunctions, however, is not sufficient to secure its reform because established institutions tend to be resilient. The three main sources of institutional resilience identified by Pierson include coordination problems, veto points, and asset specificity and positive feedback (Pierson 2004:142-153). Any one of these is enough to make an institution resistant to reform. The institutions of Prairie transboundary water governance exhibit all three, making them particularly resilient despite increasing evidence of the need for reform. These concepts are examined in more detail below.

Coordination Problems

From a collective action perspective, institutions are highly valued because they serve as mechanisms for resolving difficult coordination problems amongst actors. This is the case with the Prairie transboundary river management regimes which were created decades ago to overcome coordination problems in water development. Because the coordination problems of water development will remain, and probably intensify, with the onset of climate change, governments may be very

reluctant to abandon tried and true institutions for addressing these problems, even if they are contributing to water shortages and environmental degradation. These negative effects may be discounted and subordinated to the overriding goal of maintaining predictable and stable international coordination, which is a key objective in itself for many governmental and private interests. In other words, the current transboundary regimes may be maintained simply as a means of ensuring stability and comity in Prairie water management, notwithstanding the negative economic and environmental effects these regimes may have.

Multiple Veto Points

Even if the region's governments are willing to take a chance on new transboundary water management regimes that are more effective in the context of climate change, the presence of multiple veto points in the institutional reform process contributes to the difficulty of achieving institutional reforms. "Veto points" refer to actors within an institutional reform process who have the authority to block and reject reform proposals. Based largely on the work of George Tsbelis (1995), it is now widely recognized that the more veto points that exist within a reform process, the less likely it is that reforms will occur.

Multiple veto points also increase the probability that any successful reforms will be watered down to the lowest common denominator of the various interests controlling them, thus hampering their effectiveness. To reform the Prairie transboundary water governance regimes, reform proposals must pass through a number of veto points, most notably the IJC, and both the U.S. and Canadian governments, with all the concomitant veto points internal to each of these. Clearly there are ample opportunities for those disaffected by a proposed reform to block it and any reform proposal that makes it through all of these veto points is unlikely to move far from the institutional status quo.

Asset Specificity and Positive Feedback

The governments and private interests in the Prairie region have invested heavily in infrastructural and organizational assets that are specific to the current transboundary water management regimes. These investments, in themselves, provide substantial positive feedback that helps to perpetuate the current regimes.

One has only to look at the existing infrastructure of dams, canals, and irrigation along Prairie transboundary rivers to realize that a massive public and private investment has been devoted to constructing these very valuable and specific assets connected to water development. The farmers and riparians who benefit from this infrastructure, the public servants who maintain and manage it, and the politicians who have built careers on its construction all receive substantial positive feedback from its continued existence.

Institutional reforms to address climate change could present a threat to some of these investments by posing the risk they could become stranded or lost in a new regime that seeks to roll back water use or restore natural river flows. So, despite growing recognition of the dysfunctions of the current water management regimes, many public and private interests are so heavily invested in them, politically and financially, that it is very difficult for these actors to contemplate major reforms.

Overall, the Prairie transboundary water management regimes' capacity for institutional resilience suggests that institutional change, if it occurs at all, is most likely to be incremental and reactive. Given the investments that water development interests have made in these regimes and their desire to manage coordination problems peaceably, these interests can reasonably be expected to have a conservative approach. This orientation, combined with their access to many veto points, means that institutional reforms are unlikely to stray far from the development-friendly status quo.

The actors involved in this situation—including the IJC and the U.S. and Canadian governments—are unlikely to pursue institutional reforms until the need for such reforms becomes clear and compelling. Reforms to address climate change are most likely to be reactive rather than proactive. A key question which remains unanswered is whether these reactive institutional changes will be able to keep pace with the changing climate. If climate changes outpace institutional changes, severe environmental, economic, and social dislocation may be the result.

An incremental and reactive response to the threat, one that may or may not prove adequate to the looming situation, is the most likely scenario. However, a more dramatic transformation of current water management regimes is not unthinkable. The likely impetus for rapid change would be some kind of environmental calamity, such as a prolonged drought or a severely degraded river. Such disasters can serve as "focusing events" that re-frame governance issues and serve to

sway the status quo by destabilizing resilient institutions.

Conceivably, a major environmental crisis could reframe Prairie water management from developmental terms to environmental terms, opening up a wide range of institutional reform options quite different from the status quo. Unfortunately, such dramatic institutional change would come at a potentially high environmental, economic, and social cost.

CONCLUSION

Almost a century after the creation of the IBWT, the IJC and its international river management regimes in the Prairie region are entering a period of challenge and uncertainty. For decades, these regimes have been an integral part of the Prairie political economy, serving the interests of farmers and riparians and facilitating water control and beneficial use on a massive scale.

Full allocation on many Prairie rivers, while a tribute to the success and achievement of water management objectives put in place a century ago, has more recently revealed vulnerabilities in this region's political economy. Sectors of this economy have become victims to recurring problems of water shortages and environmental degradation. Already a threat under current climate conditions, these problems could undermine the political economy under a warming climate trend. The threat of global warming that has been endorsed by all major governments presents unprecedented challenges that risk completely overwhelming current Prairie river management schemes.

In the next few decades, the major challenge facing the IJC and its partner governments in the Prairie region will be to adapt their international river management regimes to the imperatives of climate change. However, the challenges involved with reforming these regimes are formidable. The many vested interests benefiting from the current regimes have a considerable number of veto points at their disposal to block the reform process or render it ineffectual. The fact that the existing regimes have undergone relatively few reforms since their creation, despite the emergence of the environmentalist movement and various new water users who have pressured for reform, is evidence of how resilient these institutions have been in the past.

Institutions such as the IJC and the transboundary Prairie river authorities it has spawned are valued for their durability. They brought perceived problems under control and are widely credited with contributing to a flourishing political economy in the region. However, their same durability can seriously undermine needed change and lead to the erosion of regional stability and institutional legitimacy. It will be up to the partner governments in the Prairies to figure out how to resolve this institutional paradox if the IJC is to continue to have a meaningful role in the management of the Prairie transboundary rivers over the next century.

NOTES

1. More specifically, the United States argued that the apportionment should be measured at the border while Canada argued that it should be measured upstream, near the rivers' sources. This was relevant because an upstream apportionment would have provided Canada with a larger share of waters originating in the United States, particularly on the Milk. On the other issue, there was agreement that Canada had a prior appropriation of 500 cubic feet per second on the St. Mary and the United States had a prior appropriation of 500 cubic feet per second on the Milk, but there was disagreement on how to operationalize the "equal apportionment" of the waters in excess of these prior appropriations. While Canada felt that all waters in excess of the prior appropriations should be divided equally between the two countries, the United States felt that the non-prioritized country should get the next 500 cubic feet per second, then the remaining waters should be divided equally. Native water rights in Montana were also a concern in relation to Article VI, but were not a major issue in the IJC proceedings. (See Halliday & Faveri 2007:80).

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The author examines threats to fisheries and water quality throughout the Great Lakes region through the lenses of geographic, socioeconomic and government systems and their respective loci of responsibility. Since ecologic systems do not necessarily adhere to geographic boundaries nor do they respond to socioeconomic or governance systems, some coordination and integration of response is necessary to have effect. Two test cases are examined. One looks at the unified response to the sea lamprey, an invasive predator that, half a century ago, began posing a threat to indigenous fish populations. The other examines the effectiveness of a newer response construct, remedial action plans (RAPs), in remediating ecologic "hot spots." While the mobilization against the sea lamprey was focused and generally successful, RAPS have brought about inconsistent and dubious outcomes. Based on this analysis, RAPS are able to be most responsive and effective in action when control and authority are shared and decentralized to a broad range of stakeholders.

Chapter 4: Transboundaries of Environmental Governance on the Great Lakes

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Boundaries are ubiquitous. They signal differences and imply diversities. They extend into the natural world by characterizing ecosystems or species or watersheds. They are essential components of human arrangements by indicating differences between genders or nation states or computations. Rarely are boundaries either impermeable or permanent. Movements across boundaries occur regularly and sometimes suddenly. Living systems and artifactual systems can and do change.

Recently some scholarship has emerged to analyze boundary changes in the environmental field of study. The impetus comes from ecological science and its concerns with "adaptive management" of living systems through governance arrangements (Lee 1993; Gunderson, Holling and Light 1995; Gunderson and Holling 2002; Dietz, Ostrom and Stern 2005; Scholz and Stiftel 2005; Armitage 2008). It has also come from social science and its concerns with social dilemmas found in "common pools" like the classic "tragedy of the commons" or the "nesting of institutions of governance" (Ostrom 1990; Ostrom, Gardner and Walker 1994; Ostrom 1998; Ostrom et al. 2001; Sproule-Jones 2002; Dolsak and Ostrom 2003; Ostrom 2007; Barber 2008). Ecological science is stressing the uncertainties over time of prescribing solutions to apparent ecological problems such as the sustainability of fish populations or the productivity of forest stands. Social science finds that prescriptions for either governmental solutions or market processes are both too context free and tend to discount the solutions devised by communities of users and stakeholders, such as those for preserving Alpine meadows or sustaining Maine shellfisheries.

In both the ecological and socioeconomic sciences, these theoretical problems seem to embrace boundary problems in three different senses. First, there are boundary problems in the different rates of adaptation through time that are experienced by various ecosystems. There are different interconnections as natural systems

pass through such stages as exploitation, conservation, release and reorganization.

Second, there are boundary problems related to space that are experienced by socioeconomic systems that extend across large-scale water resources like those found in the Great Lakes Basin. Water quality issues, for example, vary considerably from one watershed to the next and localized problem solving may ignore the interdependencies between local and lakewide pollution.

Thirdly, there are boundary problems related to governance linkages. The linkages run horizontally and are largely intended to couple different resource users. They also run vertically between national and subnational governments in developing and implementing consistent regulations. National and state/provincial governments can and do have a range of policy concerns that can exceed their interests in Great Lakes problems exclusively.

All three sets of problems pose problems of synchronicity. And while it is beyond the scope of this paper to present a theory or framework explaining when and why synchronicity can work, we will be able to develop some valuable conclusions about transboundary relationships by analyzing two contrasting cases.

The first case, the sea lamprey case, represents a series of coordinated actions by governance institutions and by socioeconomic actors to nullify a major threat to the sustainability of commercial and recreational fisheries on the Great Lakes. The second case, involving remedial action, was and is still an incomplete effort to remediate impaired beneficial uses in the 43 most polluted bays, harbors and river mouths in the Great Lakes. In most of these polluted "hotspots," the governance, socioeconomic and ecological systems have been "out of sync."

We begin by briefly describing the context for later generalizations. The context includes the natural ecological, socioeconomic and governance systems that exist within the Great Lakes Basin. These short descriptions are drawn from governmental documents and some of my previous work (Sproule-Jones, 2002). Experience in the Great Lakes will be used as illustrative examples of larger processes. After the three systems (natural ecosystems, socioeconomic and governance systems) are described, we will develop the two cases at length.

A final discussion section following the case studies, represents an effort to draw from those cases to generalize about transboundary relationships and suggest key solutions for both the theory and practice of environmental governance.

THREE SYSTEMS DESCRIBED

The following observations are drawn from my own work and that of others (Solec 1995, 2005, 2006; Sproule-Jones, 2002), and are meant to be illustrative of larger processes.

Ecosystems in the Great Lakes Basin

The Great Lakes Basin exceeds 765 square kilometers or 295 square miles. The five Great Lakes occupy an area greater than half a billion square kilometers, have a shoreline of 17,000 kilometers (10,000 miles), and provide habitat for diverse biotic communities in the waters, coastal zones and lands.

A recent review of indicators designed to measure the status of biotic communities suggests that many community populations are deteriorating or reduced. These include benthic invertebrates, zoo plankton and fish species. Their decline seems to be associated with loss of wetlands and other aquatic habitat, as well as contamination from point and non-point sources.

Indeed, Lake Ontario has lost 80 percent and the other lakes some 60 percent of aquatic habitat and wetlands since the 1780s. More than 85 percent of the land area of the basin is in agriculture or forestry, but these habitats are also subject to developments for human settlement and transportation (Solec 1995; Solec 2006). Thus the geographical spaces available for ecosystems are reduced and deteriorating. Populations are smaller and less diverse. However, we lack sound knowledge of the upper or typical levels of multiplicity and diversity of sustainable ecosystems.

Socioeconomic Systems of the Great Lakes Basin

The basin has historically supported a diverse range of human activities both on the land and on the waters. Some 35 million inhabitants reside in the basin and carry

on the diverse activities of modern industrial economies, as well as a significant amount of farming in the lower portions of the basin land (28 percent of the land cover). The land also supports some forestry and mining. The urban areas cover barely 2 percent of the land mass even though it is home for three very large urban populations ranging from four to eight million people in the metropolitan areas surrounding Detroit, Cleveland and Toronto.

Human activities are reflected in the variety of ways that the waters are used and enjoyed in the basin. A traditional activity is commercial shipping, mostly of bulk cargoes like iron ore and grains. Cargoes and vessel traffic have decreased by 30 and 57 percent, respectively, since 1980, due to the development of subsidized grain production in the European Union (EU).

Pleasure boating, on the other hand, has grown substantially and is associated with the growth of sport fishing. "Angler Days," defined as a single person fishing for at least 20 minutes in an one day, now exceed 23 million annually in the five Great Lakes. In contrast, commercial fisheries, whose production rose to 1 billion pounds per year early in the 20th Century, now land one-twentieth that amount, or 50 million pounds per year, due to overfishing, pollution and habitat destruction.

There are several other important uses of the lakes. First, hydroelectricity, largely from Niagara, provides 20 percent of Ontario's power and smaller amounts in Wisconsin, Michigan and New York. In addition nearly 2,493 cubic metres per second of Great Lakes water is withdrawn for irrigation (29 percent), public water supply (28 percent) and industrial uses other than hydroelectric power generation (24 percent).

The volume of groundwater withdrawals is unknown. Diversions also occur, with the largest at Chicago (91 cubic meters per second) for public water supply and sewage disposal. The largest diversion into the lakes occurs in Lake Superior, where 158 cubic meters per second is diverted from Long Lac and Superior for hydro purposes downstream at Niagara.

Yet another use of the Great Lakes is for waste disposal, both point source liquid wastes from industries and municipalities, and non-point source pollution from agricultural and urban lands. One estimate places the liquid wastes at 57 million tons per year, much of which is partially treated for conventional pollutants and pathogens (Colborn et al.1990).

> "Ontario has lost 80 percent and the other lakes some 60 percent of aquatic habitat and wetlands since the 1780s.... geographical spaces available for ecosystems are reduced and deteriorating.

In sum, the basin has been a major contributor to the social and economic well being of large numbers of first, second and later generations of immigrants on both sides of the Canada-U.S. border. The basin has provided crops, energy, water, fish and wildlife for burgeoning populations. But there have been negative consequences in terms of impacts on ecosystems through settlement patterns and waste disposal.

Governance Systems of the Great Lakes Basin

The governance systems for large-scale multiple-use river basins like the Great Lakes Basin, are based on different patterns of relationships for different resources uses. "Rules" emerged and were initially formalized in common law. Different patterns of rules exist for commercial fishing, for example, than for hydroelectric generation. The rules were often later codified into statutory laws, but still tended to retain the differences based on use. This is a common feature of all regimes with a common law heritage (with a possible exception for New Zealand since 1990).

Because different patterns of rules are developed around different uses of a resource, we find a large and diverse number of rules in a governance regime such as the Great Lakes. There is no necessary hierarchy of rules; rather, the patterns is one where "nests" of rules

Figure 4.1: Water Resource Users and their Clusters

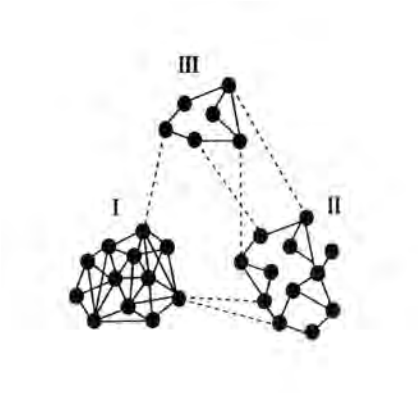
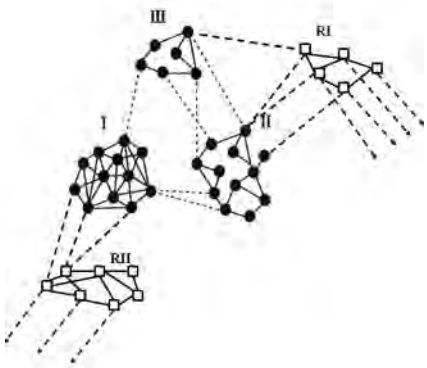


Figure 4.2: User Clusters and Regulator Clusters



are built around different resource uses. So various shipping ports, the St. Lawrence Seaway Authority, public transportation agencies, the International Joint Commission (IJC) and others, will cluster and interact to develop and implement policy changes for commercial shipping (including lake levels). Other clusters address waste disposal and water quality uses of the lakes and still others the commercial and recreational fishing uses. The linkages can span levels of government, the boundaries between the public and private sectors and the organizations of different countries like Canada and the United States. Occasionally, the clusters will contain overlapping member organizations, such as the IJC, which is concerned with many uses of the Lakes. However, generally the "coupling" across the clusters can be referred to as "loose coupling" compared to the "tighter coupling" within comparable policy network (Sproule-Jones 1993; Dorcey 1994; Young 2002).

In this kind of regime, there is no necessary hierarchy of organizations across policy networks and no single basin-wide authority. Instead, interaction and coordination proceed largely through a mutuality of interests by resource users, regulators and managers. Figure 4.1 displays an example of these governance structures (adapted from Scheffler et al. 2002, 233; Sproule-Jones, 2008 B). Figure 4.2 portrays the clusters in relation to what the literature refers to as vertical linkages or coupling as opposed to the horizontal linkages or coupling among resource users themselves. The figure shows two clusters of regulatory agencies (RI; RII) with "vertical relationships" to user organizations and also relationships with organizations not in this particular watershed or basin (the lines with arrows) (Berkes 2002; Young 2002; Sproule-Jones 2008).

The names and character of the horizontal and vertical relationships are fully described in many sources. On an international level, they include the Boundary Waters Treaty of 1909, which is the foundation of the IJC; the Great Lakes Water Quality Agreements of 1972 and 1978; the Great Lakes Charter of 1985 and 2007; and at least 20 further rules listed in Appendix 4.1. There is a plethora of rules for the multiple uses embodied in legislation of two federal governments, eight state or provincial governments, and the bylaws of some 6,000 local governments. Some pertinent examples are included in subsequent sections of this paper.

The governance systems exhibit some analogous links and flexible boundaries as do ecosystems and open socioeconomic societies.

THREE SYSTEMS AND TWO CONTRASTING CASES

We now have three short overviews of natural, socioeconomic and governance systems operating within the Great Lakes Basin. The question now arises about the capacities for the systems to be integrated across the very different kinds of boundaries. Under what conditions can the systems be "in sync" and under what conditions do they pose negative consequences for each other?

We will explore two case studies. In the first case, a well defined ecological problem (the sea lamprey) was managed and controlled by integrated governmental and socioeconomic conditions. It is a remarkable case in that integration of all three systems to deal with fisheries problems on the Great Lakes had largely failed before the lamprey infestation induced transboundary integration. Yet, as we shall see, some consequences of this experience remain a challenge some decades later.

The second case concerns the establishment and operation of Remedial Action Plans (RAPs) in 43 polluted "hot spots" on the Great Lakes. The "hot spots" had been identified as such by scientists working with the IJC over some decades of study. The Commission recommended concerted governmental and socioeconomic action to reduce and eliminate some common impaired beneficial uses. The integration across the three boundary systems proved too difficult in most of the areas of concern, and only three areas have been "delisted" as hotspots in nearly 25 years of efforts.

The Sea Lamprey Program

The sea lamprey is a parasitic invasive species that was introduced into the Great Lakes environment some decades ago, probably from ballast water of freighters and perhaps through migration up shipping canals from the Atlantic Ocean (GLFC 2005). These aquatic vertebrates native to the Atlantic Ocean resemble eels, but unlike eels, they feed on large fish. They can live in both salt and fresh water, which has allowed them to adapt to the Great Lakes environment.

The introduction and spread of the lamprey had a fast and immediate impact on all species of Great Lakes fish, including trout, salmon, whitefish, chubs, walleye, catfish and even sturgeon. Lamprey eels thus contributed significantly to the collapse of these fish species that were the mainstay of a vibrant Great Lakes commercial fishery. For example, it is estimated that 15 million pounds of lake trout were harvested annually in Lakes Huron and Superior before the lampricide program began. By the early 1960s, the catch was only 300,000 pounds (Applegate 1961, 3). The ecosystem was not only in exploitative distress, but the pace of change jeopardized any organizational response.

In an effort to address this infestation and the collapse of the Great Lakes fishery, Canadian and American governments established a unified body to eradicate the sea lamprey. The Great Lakes Fishery Commission (GLFC) was established by the Convention on Great Lakes Fisheries between Canada and the United States, and ratified on October 11, 1955. Together the Commission, in cooperation with Fisheries and Oceans Canada, the U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers, participate in sea lamprey control on the Great Lakes. The Commission has two major responsibilities: first, to develop programs for research on the Great Lakes and recommend measures to permit the maximum sustainable productivity of fish stocks; and second, to formulate and implement a program to eradicate or minimize sea lamprey populations in the Great Lakes. The GLFC has created a multi-faceted Sea Lamprey Control Program to meet this latter objective.

The Sea Lamprey Control Program has utilized various methods such as using barriers, sterile-male release technique, trapping, and lampricides, in an attempt to eliminate this species from the Great Lakes. Sea lamprey barriers block the upstream migration of spawning sea lampreys, allowing for most other fish to pass with minimal disruption. The sterile-male release technique aims to reduce the success of sea lamprey spawning through the collection and sterilization of male lampreys each year. When these males are released back into streams, they still compete with fertile males for spawning females. Due to this fact, only spawning sea lampreys are used in the sterile-male release technique, as these males are past their parasitic phase (that is, they no longer prey on Great Lakes fish) and die after the spawning run. In addition to barriers and sterilization, the sea lamprey traps are operated at various locations throughout the Great Lakes, often in association with barriers. These traps are designed to catch lampreys as they travel upstream to spawn. Male lampreys caught

in traps are used for the sterile-male release technique, whereas most females are used for research.

Although these methods, particularly barriers, have sought to reduce or eliminate the use of lampricides with the Sea Lamprey Control Program, the primary method to control sea lampreys is still the use of TFM (3-trifluoromethyl-4-nitrophenol) as lampricide. Studies commissioned by the GLFC and independent researchers suggest that TFM is not persistent, is detoxified and poses no threat to wildlife (Hansan and Manian 1978, 6; Hubert 2003, 461). Questions still remain about the long run exposure of macro-invertebrates in streams and also of crops sprayed with irrigation water contaminated with TFM (<10mg/L of water) (Gilderhus 1990, 3; Hudson 1979, 4; Lieffers 1990, 1). The program has made some improvements of fish stocks (Francis 1979) and massive reductions in lamprey populations, including a 90 percent reduction of the predator in Lake Superior, where the control program has been in operation for the greatest number of years. By 1972, the sea lamprey controls and lake trout restoration had a well-organized operational status, permitting the GLFC to dedicate resources to other areas (Francis 1979).

The GLFC credits the program with successfully arresting the invasion and permitting the fisheries ecosystem to reorganize. In that sense, the governance system readapted itself to help restore the ecosystem. The socioeconomic system in the form of the sports fishery successfully lobbied for introduction and continued program longevity.

Three major reservations must still be noted with this focused intervention on a single alien species. First, while a multiple intervention process was put in place, much of the success appears to be due to the TFM larvicide, and any such intervention poses some ecological risks. Second, while the main focus on one alien species appears successful, a broader approach may have been preferable. Third, the case is notable for bringing together multiple governmental units in an integrated fashion after many decades of failure (and some would argue after as well). Below, each of these reservations about the Sea Lamprey Control Program is discussed.

Ecological risks

The scientific data on the impacts of TFM on macro-invertebrates is not fully conclusive. In a study for the GFLC, Lieffers (1990) reports an 88 percent decrease in macro-invertebrates with streams exposed to TFM. Lieffers found that affected populations fully recovered within five months. Yet, this sudden decrease within this taxa should raise concerns, as macro-invertebrates function as vital components of freshwater ecosystems, serving critical roles in organic matter processing, predation of invertebrates and vertebrates, and as food. Even Lieffers himself acknowledges the crucial functions of these organisms within streams. Despite the lack of concern expressed within this study, it would seem that an eradication of macro-invertebrates and their important functions within streams could pose significant risks for the stream environment and other species within this affected area.

In examining the research provided in support of the use of TFM for its relative harmlessness to other aquatic life, it should also be noted that most studies are grounded in the fact that only low doses are required to eliminate sea lamprey. However, one might question the results of increased doses of TFM, which may be required to treat an increased and more resilient population of sea lamprey. According to recent studies on sea lamprey and the current environmental context of the Great Lakes, impacts such as improved water quality and climate change could invariably increase the population of sea lamprey. Ferreri found that improved water quality in streams has been linked to increased amounts of suitable sea lamprey spawning, which could ultimately lead to increased lamprey production (Ferreri et al. 1995). Similarly, Holmes has found that the sea lamprey is an early responder to climate change. According to his study, the warmer temperatures associated with climate change may reduce the incubation period, increase survival and lengthen the growing seasons in streams (Holmes 1990). Given this evidence that the environmental context of the Great Lakes region could alter the conditions within which sea lamprey spawn and could result in an increased population of this species, it is questionable as to whether the same doses would be used to combat this creature and, as such, whether these doses will have differing effects on the other wildlife in the ecosystem.

We might expect these kinds of uncertainties in any efforts to knead governance and socioeconomic arrangements with ecological systems.

A broader view of alien species

In 2008, the U.S. Saint Lawrence Seaway Development Corporation began to require all ocean going vessels to flush ballast tanks in areas 200 miles offshore. Similar

action was taken by the Canadian Seaway Corporation in 2006. However, initial calls for strict control of ballast waters were made as early as 1972. Estimates suggest that over 20 invasive species were likely to have originated in vessel ballast water (GLFC 1993). It could be argued that preventive action for the use of TFM could have been avoided if the U.S. and Canadian governments had responded to earlier requests of the GLFC and the IJC to introduce mandatory ballast water discharges to replace voluntary guidelines.

This concern is one of cross-sectional coordination, that is, coordination between the governance systems established for fisheries and those for shipping and navigation. Focused solutions for immediate ecological problems appear to have unanticipated consequences across boundaries.

Sea lamprey and international fisheries

The U.S. federal government, the eight riparian state governments, the Canadian and Ontario governments, plus (in recent years) various aboriginal group claimants on both sides of the national border have had many decades of unsuccessful attempts to include formal coordination activities over the management of Great Lakes fisheries. It was not until the joint U.S.Canadian Convention on Great Lakes Fisheries (the body that established the GLFC) in 1954, and the later Joint Strategic Plan for Management of Great Lakes Fisheries in 1981, that coordination across the multiple governance boundaries took place.

The GLFC operates very much like the IJC in that, apart from its sea lamprey control responsibilities, it coordinates research and advises respective governments about appropriate management and remedial strategies. It has no direct regulatory authority. It works to coordinate lakewide fisheries plans of the various state and provincial fisheries agencies. Efforts to invest regulatory authority in an international body like the GLFC by means of a treaty collapsed in 1915 and in 1946 due to opposition in Congress. (The 1915 incident abolished a signed, ratified and proclaimed Treaty of 1908.)

Fisheries on the Great Lakes are generally the shared responsibility of multiple governments, with the provinces and states owning the lake bed and fish and determining access. The Canadian government delegates most of its constitutional powers to Ontario province under a century old inter-delegation of authority, but retains fiduciary interests due to aboriginal claims and concerns with pollution. The U.S. government guarantees fishing rights through regulated treaties with First Nations (Dochoda 1999).

Unlike the successful sea lamprey program which responded to a severe common crisis for most fisheries and regulators, wide generic sustenance of the Great Lakes fisheries makes dismal history. One commentator concludes his historical review as follows: High levels of exploitation and other stresses (habitat destruction, water quality depreciation, species introductions) have resulted in the partial or complete collapse of fisheries for most populations of commercially important fish species at some point in the past 200 years (Brown, Ebener and Gorenflo 1999, 347-48).

The difficulties of producing coordinated responses to ballast water controls by the two nations suggests that the control of the sea lamprey may remain a significantly isolated incident in the sustainability of Great Lakes ecosystems and their relationships across governance and socioeconomic boundaries.

The Remedial Action Program

Socioeconomic, governmental and ecological systems are often not well integrated across large geographical spaces and boundaries, despite common visions for resolving negative interdependencies and uses of a valuable common resource such as the Great Lakes. A traditional way to integrate such systems is to rely on common law, and courts still use the principle of navigable servitude to grant priority to shipping over other uses (Sproule-Jones 1993). Some of the states and provinces attempt to prioritize sectoral uses, often giving top priority to that of clean potable water for domestic purposes (Percy 1998) but these efforts rely on regulations for enforcement rather than negotiations between parties to end any dispute. In these circumstances, one would expect few common behaviors of socioeconomic systems and governance systems in relation to their impacts on ecosystems.

In 1985, the International Joint Commission approved and promoted localized efforts to coordinate multiple users as stakeholders to remediate identified deficiencies in the local bays, harbors or river mouths. These efforts were to be termed Remedial Action Plans (RAPs) which were to be developed for local "pollution hot spots" or Areas of Concern (AOCs). Fourteen deficiencies (or "impaired beneficial uses") were identified, and each AOC could have anywhere between three and

14 of the problems. Appendix 4.2 provides a map of the AOCs in the Great Lakes, and Appendix 4.3 lists the improved uses for each AOC. It is perhaps important to note that six of the impaired uses have a direct impact on ecological health and reproduction, and one is expressly that of improved fish and wildlife habitat.

In the 20-plus years since RAPs were developed under the auspices of state and provincial environmental regulators, with the help of their federal counterparts, only three AOCs have been delisted as environmental hot spots. Some progress has been made in re-establishing fish and wildlife habitats (Jackson, 2006) but many of the indicators of ecological health and reproduction imply mixed, uncertain or even deteriorating status (Solec 2005). What has gone wrong? We explore this question by examining first the history of pollution control on the Great Lakes, then the institutional arrangements put in place for planning and implementation of RAPs. We find that institutional design was inadequate and potential flaws were built into the system.

History of Great Lakes pollution controls

As early as 1912, the Canadian and U.S. governments asked the IJC to examine the general extent of pollution in the Great Lakes and to make specific recommendations for connecting channels. The IJC recommended sewage treatment and water purification to control human waste disposal. The limited response led to degraded water quality conditions in the lower lakes. By 1953, the bottom waters of Lake Erie showed the first signs of anoxia. By the late 1960s, the lake was often characterized as "dead" (Colborn 1990, 95). The lake was subject to "cultural eutrophication" whereby phosphorous (as a nutrient) led to an algae bloom in this, the smallest of the five lakes, and one with low levels of dissolved oxygen in summer months.

The IJC was a focal point for advancing the need for government responses. As early as 1960, it began a series of scientific reviews that emphasized nutrient loadings as the primary cause of eutrophication. Reports produced in 1965 and 1969 further advanced the case (Munton 1980; 155; Muldoon1980). Ministerial meetings between 1970 and 1972 finally produced the first Great Lakes Water Quality Agreement (GLWQA). The environmental movement in the two North American countries both advanced and drew strength from the burgeoning pressures on each of the two national governance systems. Ecosystems and socioeconomic systems appeared to be finally synchronized with government systems in responding to this problem issue for the Great Lakes.

The practical consequence of the GLWQA was the reduction of phosphorus loadings through improved sewage treatment. Targets and objectives were attained by 1991, and chlorophyll a (an indicator of nuisance algae growth) declined to acceptable levels by the early 1990s.

A second GLWQA was signed in 1978, and it shifted official government attention toward the control of toxic substances within a broadly-defined ecosystem approach. The Agreement specifies water quality standards in terms of chemical, physical, microbiologic and radiologic properties. The Research Advisory Board of the IJC went further and identified 43 (later 44) AOCs where beneficial uses of the ecosystems were significantly impacted. The AOCs coincided with sites that had been under investigation for water quality conditions, rather than corresponding to particular socioeconomic communities. The IJC recommended the formulation of RAPs to the two national governments. In 1985, a new statute establishing RAPs was passed by the U.S. government and the Canadian and Ontario governments. Quebec declined any joint involvement.

The IJC recommended that multiple stakeholders be included in the formulation and implementation of RAPs in order to secure a potential ecosystem approach by all relevant sectors. Implicit was that the respective federal, state and provincial governments could designate one or two lead agencies to fashion the institutional design. RAP agencies were asked to deliver reports in three stages: a problem definition report (Stage 1), a developed RAP (Stage 2) and a "sign-off" report (Stage 3) that would confirm that uses were restored and the site can be delisted as an AOC. The Water Quality Board of the IJC would assess each level of the reports when completed.

Institutional design and the success of RAPs

The lead agencies of the respective two levels of government in the domestic AOC's (and the four levels in the international AOCs) used their discretion both to select participating stakeholders and to set the agendas for both the Stage 1 and Stage 2 reports.

The lead agencies selected representatives from all levels of government in each AOC plus representatives of industry, farming groups, environmental groups, universities and "citizens at large." Of the major users, recreational, shipping and human health groups were

largely ignored and aboriginals were included in only one AOC. There was often little attention paid to balancing interests, and one AOC had 22 of its 23 members selected from a local chamber of commerce (Sproule-Jones 2003, 2008).

In a couple of large AOCs, the Cuyahoga River (responsible for draining an urban and agricultural watershed including Cleveland and Akron) and Hamilton Harbour, the stakeholders were deliberately selected to be fully inclusive and to engage in formulating the Stage 1 and 2 reports with the advice of local agencies, rather than vice-versa. A suggestive indicator of the importance of decentralized decision making by stakeholders—rather than by agencies with stakeholders advice—is the subsequent perception held by RAP coordinators (lead agency officials) that the RAP has improved beneficial uses due to its use of inclusive decision making as well as collaboration between stakeholders and agency report-writing teams. This finding was statistically significant at 99 percent probability (Sproule-Jones 2002, 2009). The top-down model of most RAPs is seen as less effective.

The dominance of lead agencies in the RAP process led almost inevitably to inclusion of traditional water quality concerns in the various RAPs. These concerns included regulations for industrial and municipal discharges, sediment remediations and any other of the 18 different priority problems listed in the Stage 1 reports. Lead agencies had the discretion to identify traditional concerns as stressors that need to be reduced and hence, by inference, help restore beneficial uses. This was, at best, wishful thinking rather than effective ecological science. A less sanguine conclusion offered by some officials was that the RAP process could be used to tease extra funding from Congress or the Canadian government.

As a result of these design deficiencies, and in some cases such as Detroit, Michigan, and Toronto, Ontario, improvements in beneficial uses have been modest at best. In many cases, it appears as if lead environmental agencies were indifferent to, or cavalier about, institutional design and effective strategies for delisting AOCs

Consensual arrangements between stakeholders drawn from different sectors took a variety of forms, from inclusivity and balance with supportive lead agencies to agency dominance with selective stakeholder commentaries. Consensual arrangements were even more difficult to establish in AOCs that spanned international and interstate boundaries. In cases involving the Niagara, St. Lawrence, Detroit and Menominee Rivers, parallel RAPs had to be developed to deal with differences in priorities from one side of the river to the other side. It was easier for lead agencies to defect from consensual arrangements in the face of bureaucratic and financial controls from their respective state or provincial governments. Neither the U.S. nor the Canadian government appeared willing to facilitate cooperation over defection.

Thus, while we may conclude that some improvements in the ecological conditions of AOCs have occurred in the 25 years since RAPs began, the linkages between these improvements and the Stage 2 RAP reports is ambiguous at best. Boundaries between stakeholders from different sectors were sustained by governmental lead agencies. Boundaries between sovereign jurisdictions (national and interstate) were also sustained.

CONCLUSION

This paper has examined boundaries for taking action to protect and preserve the Great Lakes of North America and their beneficial uses for both Canadian and U.S. populations. We have not limited our concerns to political boundaries of the two national, nine state and provincial and 6,000 local governments, but have expanded our concerns to reveal how such political or governance boundaries are synchronized with ecological and socioeconomic boundaries as well.

Our studies reveal that the three systems of governance, representing political, ecologic and socioeconomic systems, all have important internal boundaries that affect the environment of the world's largest freshwater basin. We discussed, early in the paper, how legal boundaries had grown up around different uses of these waters, and how sectoral or policy boundaries and communities of interest (stakeholders) were key actors depending on particular sites or lakes or the basin as a whole. Our two case studies revealed, first, how fisheries and commercial shipping were interdependent in any efforts to deal with complex issues like alien species in general or the sea lamprey in particular. In the second case, an explicit

effort was made, ie, the construction of RAPs to build into the Great Lakes situation some 43 fora (forums) where stakeholders' interests could be articulated and aggregated into a community strategy for remediating pollution "hotspots." Unfortunately this system became, in most cases, a contest for controlling the agenda and the implementation of preferred issues. Environmental agencies of government proved to be consistent winners amongst stakeholders.

The two policy cases discussed here, those of the sea lamprey invasion and the use of RAPs to address ecologic hotspots, provided some insights into the necessary, if not sufficient, causes of synchronicity between the three systems of ecology, governance and socioeconomic community. In the sea lamprey case, a widespread mobilization of commercial and recreational fishers, large scale cooperation amongst agencies from different governmental systems and a well-defined problem amenable to relatively easy solutions all contributed to a successful program. It helped that the levels of scientific risks with lampricide were relatively small.

In contrast, the RAP program often lacked basic environmental science knowledge about apparent intractable problems such as the contamination of fish. Too frequently, strategies were introduced to reduce or remove purported stressors for ecosystems without basic knowledge of their effectiveness in reaching the specified targets and the goal of delisting an AOC. Some RAP programs were more successful than others, including those that displayed collaborative action amongst stakeholders in developing Stage 2 reports. It remains to be seen whether the RAP program, in conjunction with lake-wide management programs that began in the 1990s, can over the long run provide impetus toward a sustainable and successful environment. The likelihood is that these boundary issues are likely to remain with us for some time.

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Appendix 4.1: Binational governance arrangements outside the Great Lakes Agreement involving institutions independent of the IJC

Institution	Purpose	Members	Activities/ History	Staff/ Finances
Great Lakes Fishery Commission	Coordinate maintenance of fisheries	4 from each side, named by Privy Council and President	Control sea lamprey; coordinate and advise on other fishery matters	Lamprey costs splits 69%/31% U.S./Canada; other costs evenly
Council of Great Lakes Governors	Provide a forum on mutual interests	Governors, with premiers as associate members	Developed Great Lakes Charter and seek to promote economic development in region	$20,000 annual dues, plus foundation and private support for special projects
Great Lakes/St. Lawrence Maritime Forum	Promote trade and commerce	Includes government and nongovernment organizations	Promote use of Seaway but has no formal agenda	Funds raised ad hoc for projects
International Association of Great Lakes Ports	Promote Great Lakes shipping	4 US, 5 Canadian port authorities	Lobby on impediments to use of Seaway	Annual dues of $500
Niagara River Toxics Committee	Investigate toxic chemical problems	2 each EPA, NY, Ontario, and Environment Canada	Formed by agencies to recommend actions on Niagara toxics	Staffed and financed by initiating agencies
Upper Great Lakes Connecting Channels Study Committee	Assess toxins in rivers and Lake St. Clair	Fisheries and Environment agencies, with IJC observer	Formed in 1984, with study to be completed in 1988	Staffed and financed by initiating agencies
Coordinating Committee on Hydraulic and Hydrologic Data	Coordinate methodology for data collection	Environment Canada, Fisheries and Ocean Corps, and National Oceanographic and Atmospheric Administration	Formed in 1953 to assure compatibility of data	Staffed and financed by initiating agencies
Michigan-Ontario Transboundary Air Pollution Committee	Develop cooperative program for air pollution	Wayne County, Michigan Department of Natural Resources, and 2 from Ontario Ministry of Environment	Initiated by governors and premiers; worked closely with IJC air board to 1983	Staffed and financed by participating agencies
Memorandum of Intent on Transboundary Air Pollution	Develop basis for negotiating agreement especially on acid rain	Government scientists organized in 4 technical working groups	Committee work stalled, with negotiations now by formal diplomatic procedures	Expenses covered by governments through participating agencies
Migratory Birds Convention	Control killing of migratory birds	No formal body for implementation	Signed 1916	
International Migratory Birds Committee	Foster cooperation under 1916 convention	Resource ministers and cabinet secretaries	Established 1960s; has not met since 1970s	
Canada-U.S. Programme Review Committee	Advise governments on protection of migratory birds	3 each from federal governments	Developing North American Waterfowl Management Plan	Research and participation financed by agencies
Mississippi Flyway Council	Recommend hunt regulations	1 from each state and province	Recommend regulations to federal governments	Staffed and financed by participating agencies
St. Lawrence Seaway Authority and Development Corp.	Coordinate construction operation of seaway	Administrators appointed by federal governments	Determine policies jointly for separate implementation	95% financed by tolls; balance by federal transportation agencies
Seaway International Bridge Corp.	Operate bridge at Cornwall	8 members, mostly from Canada	Maintain bridges and collects tolls	95% by tolls; balance by Seaway agencies

Institution	Purpose	Members	Activities/ History	Staff/ Finances
International Boards of Control (4)	Assist IJC decision on levels and flows	Equal members from each side named by IJC commissioners	Develop and implement regulation plans since 1909	Staffed by agencies; report publication financed by IJC
International Great Lakes Levels Advisory Board	Advise IJC on levels and public information	16 members, 8 per side, with half the members from public	Carry out studies; reports twice a year	Financed by agencies and IJC
International Great Lakes Technical Info Network Board	Study adequacy of levels and flows measurements	Environment Canada, Fisheries and Oceans Corps, and NOAA	Reported to IJC 1984 on user needs and adequacy of data	Financed by agencies involved in study and data collection
International Air Pollution Board	Advise governments on air quality	EPA, 1NY, and 3 Environment Canada	Report twice yearly on transboundary pollution	
Joint Response Team for Great Lakes	Cleanup of oil/hazardous materials spills	Canada and U.S. Coast Guards and other agencies	Maintain Joint Contingency Plan, invoked 9 times since 1971	Staffed by agencies; cleanup costs where spill occurs

Appendix 4.2: Areas of Concern in the Great Lakes-St. Lawrence River basin

Source: Environment Canada, Our Great Lakes, 1999, www.ec.on.gc.ca/glimr/maps-e.html

Appendix 4.3: Categories of use impairments for Areas of Concern on the Great Lakes

Area of Concern	Ecological health and reproduction						Habitat	Human health		Human use/welfare					
LAKE SUPERIOR															
Peninsula Harbour	3			6			14	1				7	9		
Jackfish Bay	3	4	5?				14	1?			6	7		11	
Nipigon Bay	3	4?		6	8		14	1		2		7		11	
Thunder Bay	3	4	5?	6		13	14	1	10			7		11	12
St. Louis Bay/River	3	4	5?	6			14	1	10	2?		7		11	
Torch Lake				6											
Deer Lake-Carp Creek/ River								1							
LAKE MICHIGAN															
Manistique River				6			14	1	10			7		11	
Menominee River	3			6			14	1	10			7			
Fox River/Southern Green Bay	3	4?	5	6	8	13	14	1	10	2?		7	9	11	
Sheboygan River	3	4	5	6	8	13	14	1				7			
Milwaukee Estuary	3	4	5	6	8	13	14	1	10			7		11	
Waukegan Harbor	3?		5?	6		13	14	1	10	2?		7	9?		
Grand Calumet River/ Indiana Harbor Canal	3	4	5	6	8	13	14	1	10	2		7	9	11	12
Kalamazoo River			5?				14	1							
Muskegon Lake	3		5?	6	8	13?	14	1				7	9	11	
White Lake	3		5?	6	8	13?	14	1				7	9	11	
LAKE HURON															
Saginaw River/Bay	3		5	6	8	13	14	1	10	2		7	9	11	
Collingwood Harbour															
Severn Sound	3			6	8		14	1				7		11	
Spanish River Mouth	3		5?	6?		13?	14?	1	10			7			12
LAKE ERIE															
Clinton River	3	4		6	8	13	14	1	10			7		11	
River Rouge	3	4		6	8		14	1	10			7		11	
River Raisin				6				1				7			
Maumee River	3	4		6	8			1	10			7	9	11	
Black River	3	4	5	6	8	13?	14	1	10	2?		7		11	
Cuyahoga River	3	4	5?	6	8	13?	14	1	10	2?		7	9?	11	
Ashtabula River	3	4		6			14	1				7			
Presque Isle Bay		4		6?					10			7			
Wheatley Harbour		4?		6?	8?		14		10?			7			
LAKE ONTARIO															
Buffalo River	3?	4	5?	6			14	1		2?		7			
Eighteenmile Creek				6?			14?	1?				7?			
Rochester Embayment	3	4?	5	6	8	13	14	1	10	2?			9	11	12
Oswego River	3	4?	5?	6?	8	13?	14	1						11?	

Area of Concern	Ecological health and reproduction						Habitat	Human health		Human use/welfare					
Bay of Quinte	3	4?		6	8	13	14	1	10			7	9	11	
Port Hope												7			
Metro Toronto	3	4?	5?	6	8	13?	14	1	10			7		11	
Hamilton Harbour	3	4	5	6	8		14	1				7		11	
CONNECTING CHANNELS															
St. Marys River	3	4		6	8		14	1	10			7		11	
St. Clair River		4?	5	6			14	1	10	2?		7	9	11	12
Detroit River		4		6			14	1	10			7	9	11	
Niagara River (ON)	3		5	6	8	13?	14	1	10			7	9		
Niagara River (NY)	3?	4	5?	6			14	1				7			
St. Lawrence River (Cornwall)	3	4	5	6	8	13?	14	1	10	2?		7	9	11	12
St. Lawrence River (Massena)	3?	4?	5?	6?		13?	14	1							

The numbers in this table identify specific use-impairment categories used in the Great Lakes Water Quality Agreement. (Question marks indicate the impairments being investigated.) The GLWAQ lists 14 beneficial uses that may be impaired and in need of restoration. The four general categories below contain the 14 impairments identified by number based upon the sequence in which they appear in the agreement.

Ecological health and reproduction

Degradation of fish and wildlife populations (3)
Degradation of benthic populations (6)
Degradation of phytoplankton and zooplankton (13)
Undesirable algae/eutrophication (which may cause low dissolved oxygen levels that may in turn cause other impairments) (8)
Fish tumours and other deformities (4)
Bird or animal deformities or reproduction problems (5)

Human health

Restrictions on fish and wildlife consumption (1)
Beach closings (bacteria) (10)

Human use (welfare)

Tainting of fish and wildlife flavour (2)
Restrictions on dredging (7)
Taste and odour in drinking water (9)
Degradation of aesthetics (11)
Added costs for agriculture or industry (12)
Fish and wildlife habitat (14)

Source: Adapted from Environment Canada and U.S. Environmental Protection Agency (1995), http://www.epa.gov/grtlakes/atlas/use-impa.html

Chapter 5: Transboundary Water Pollution Efforts in the Great Lakes: The Significance of National and Subnational Policy Capacity

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Almost 40 years after the United States and Canada began concerted efforts to address environmental degradation in the Great Lakes watershed region, water pollution and other environmental problems remain enduring challenges in one of the world's largest transboundary basins. Toxic chemicals, invasive species, and the projected impact of climate change are creating new pressures. Despite a number of transboundary institutions and agreements aimed at this problem, bilateral efforts have met with very limited success, in part due to asymmetries between the United States and Canada in terms of policy effort and capacity. This comparative analysis points to differences in reliance on "hard" vs. "soft" laws, whether point vs. non-point sources of pollution are targeted, and whether federal, state or provincial authorities are taking the lead. To succeed in a coordinated effort to protect the Great Lakes basin, differences in national and subnational policy and implementation capacities need to be reconciled. The need is not for more transboundary institutions, but for making existing institutions work better. A role for the IJC is envisioned, especially its mechanisms already in place for transboundary dispute resolution. However, new approaches are needed as well, including accountability to accepted scientific standards, responsiveness to multiple stakeholders, integration of water quality and quantity concerns, and convergence of policymaking efforts at the watershed level.

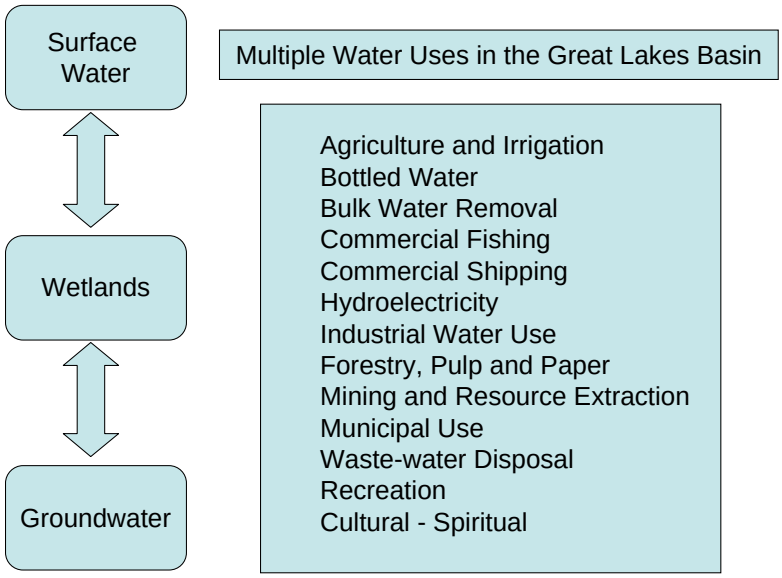
Water pollution is an enduring transboundary environmental policy issue. Problems of toxic chemicals and invasive species, not to mention the emerging science related to the impact of climate change on the water quantity and quality interface, are creating new pressures for transboundary water policy efforts in the Great Lakes. Despite the existence of longstanding transboundary institutions and agreements between Canada and the United States, and the proclamation that these efforts serve as a model for transboundary governance, there is little evidence of policy progress. Water pollution remains a significant issue in the Great Lakes and the effectiveness of transboundary institutions remains the subject of much debate.

The United States and Canada share similar types of water pollution. Despite that and the existence of a growing number of transboundary institutions and agreements aimed at finding solutions to the problem, it is clear that bilateral efforts are meeting with only limited success. Different institutional arrangements, policy regimes (Hoberg 2002) and asymmetries in policy effort and capacity at the national and subnational levels may be undermining transboundary progress in the Great Lakes basin. There is a need for new approaches to transboundary water pollution policy within the auspices of the IJC and beyond. This chapter touches on themes outlined in the introduction of this volume, including a comparison of how water

Figure 5.1 Great Lakes Basin Map

Source: http://www.mnr.gov.on.ca/mnr/ebr/gl_charter/GreatLakesBasinMap.pdf

Figure 5.2: Multiple Water Uses



Source: Sproule-Jones, M., C. Johns, B.T. Heinmiller 2008. *Canadian Water Politics: Conflicts and institutions.* Montreal and Kingston: McGill-Queen's University Press, 32.

Source: Sproule-Jones, M., C. Johns, B.T. Heinmiller 2008. Canadian Water Politics: Conflicts and institutions. Montreal and Kingston: McGill-Queen's University Press, 32.

pollution policies are framed, different forms of governance and hard vs. soft law at the transboundary and domestic levels, the significance of transboundary networks of political and bureaucratic officials; differences in geographic scope and approaches in terms of centralization and decentralization; asymmetries in effort, and impacts of transboundary governance as measured by indicators of water quality in the basin. The central argument is that in order for transboundary institutions to be more effective, important national and subnational policy differences and implementation capacities need to be taken into consideration in the next generation of transboundary efforts.

This chapter is divided into four sections. Section I outlines the enduring issue of water pollution in the Great Lakes and the need for reflection on why well-defined environmental outcomes have not been achieved some 30 years after governments on both sides of the border agreed to address them. Section II reviews transboundary policy efforts to date and then highlights policy efforts in the United States and Canada at both the national and subnational levels. Section III analyzes the comparative dimensions in light of the broad themes of this volume. Section IV offers some concluding thoughts on future policy directions.

SECTION I: WATER POLLUTION IN GREAT LAKES WATERSHEDS

The Great Lakes form the largest fresh water basin on earth, containing roughly 18 percent of the world's supply. Some 40 percent of the 8,000 km boundary between Canada and the United States is water (Gray 2005) and the Great Lakes-St. Lawrence constitutes one of the largest shared water basins in the world. The basin is home to nearly 40 million people—more than 10 percent of the population of the United States and 30 percent of the population of Canada (U.S. EPA 2007). Collectively, the five lakes and draining river systems span more than 1,200 km, two provinces and eight states (see figure 5.1). The basin has played a major role in the economic development of the United States and Canada and provides water for domestic consumption, agriculture, industry, transportation, power, recreation and a host of other uses. Some of the world's largest concentrations of industrial activity are located in the Great Lakes region (Great Lakes Atlas 1995).

As Figure 5.2 highlights, there are many different uses of water in the Great Lakes. Collectively, these local, national, transboundary and international uses have increased and changed over time and have had a negative impact on surface water, wetlands and groundwater (Sproule-Jones 2002; Sproule-Jones, Johns and Heinmiller 2008). Despite their large size, the Great Lakes are sensitive to the effects of a wide range of pollutants from all of these various users and sources. Water pollution in the basin can be divided into two broad types: point source and non-point source. Point source water pollution refers to cases in which inputs into natural ecosystems come from easily-identifiable sources, such as industrial waste and outfall from municipal sewage treatment facilities. Non-point source pollution comprises those uses in which inputs into natural ecosystems are dispersed and multi-sourced, such as urban and agricultural runoff, overflow sewage inputs, and groundwater contamination. Runoff may carry sediment, oil, gasoline, pesticides, chemicals, heavy metals, and other toxic substances into water bodies. The science for assessing both these types of pollution includes a variety of measures of water health such as water quality indicators and the monitoring of biodiversity within watersheds.

By the late 1960s, there was growing public concern about the deterioration of water quality in the Great Lakes, especially related to the problems of eutrophication and toxic chemicals. Scientific reports indicated the effects of pollution by phosphates and other nutrients and described their negative impact in terms of biodiversity. By the 1970s, scientists were documenting the extent of water pollution problems across the lakes and realized that water pollution could not be understood in isolation from other important components of the ecosystem such as sediments, air, land and biota. Pollution from a number of point sources such as industry and municipal wastewater effluent was documented in several watersheds and was the stimulus for the policy

Table 5.1: Recent Water Pollution Events in Great Lakes Watersheds

Water Pollution in Milwaukee, Wisconsin 1993	Water Pollution in Walkerton, Ontario 2000
In 1993 a Cryptosporidium (pathogen) outbreak in Milwaukee was the largest waterborne disease outbreak documented in U.S. history. Over 100 deaths were attributed to this outbreak and 403,000 of 1.6 million residents in the area became ill. The cause was found to be polluted water from one of the city's drinking water plants. Although a government study was unable to pinpoint the source of the pathogen, manure spreading and runoff were thought to be one possible source of the outbreak and the state government concluded that a combination of watershed management and efficient operation of municipal utilities that draw drinking water from the Great Lakes was required to prevent this type of water pollution in the future (Wisconsin DNR 1996).	In May 2000, seven people died, 65 were hospitalized and over 2,000 became ill from drinking water contaminated with *E. coli* OH-157. The cause of this pollution event was found to be multi-faceted but broadly attributed to surface water contamination from farming activities which polluted groundwater which was supplied as drinking water by poorly managed municipal wells. The public inquiry into this water pollution tragedy made 92 recommendations and by 2007 the provincial government had implemented all of them. A multi-barrier approach including source protection was a strong component of the policy response to this tragedy. Only in 2006, however, were indirect policy linkages made to broader Great Lakes water quality issues.

response outlined in the next section.

As a result of policy efforts at both the transboundary and domestic levels, the presence of some toxic chemicals, including polychlorinated byphenyls, or PCBs, and dioxins, dropped due to point source controls (Botts and Muldoon 2005, 137). Major reductions were made in some pollutant discharges, such as phosphorous, and as nutrient levels declined, oxygen levels in the lakes improved, algal mats disappeared, odor problems declined and some beaches reopened as a result of regulations and improved sewage control. Nonetheless, by the end of the 1980s, some 57 million tons of liquid wastes were poured into the Great Lakes annually by their surrounding inhabitants, industries and municipalities (Colborn et al. 1990, 64) and hundreds of thousands of tons of chemicals continued to be released in the Great Lakes region, reinforcing public concerns over pathogens, beach-closings, fish and wildlife impacts and habitat loss. After a period of heightened public awareness in the 1970s and 1980s and some progress in addressing water pollution, by the early 1990s there was growing public indifference to enduring water pollution issues and a broader ideational shift in environmental policy occurring from regulatory approaches to voluntary, market-based approaches which fit with the ideological focus on the economy, competitiveness and fiscal restraint of the times. These approaches were reinforced by an emerging consensus in industrial democracies that there was no convincing evidence that government spending on municipal wastewater treatment facilities and point source industrial pollution control had significantly improved water quality (Rosenbaum 1991, 200; OECD 1996). This policy shift had a significant impact on policy responses in the region. Even significant water pollution events in the Great Lakes in Milwaukee, Wisconsin, in 1993 and Walkerton, Ontario, in 2000, where people died from water pollution, did not generate a public response in connection with broader water quality issues in the Great Lakes (Table 5.1).

At the end of the 1990s the International Joint Commission (IJC) recognized a number of transboundary environmental issues and challenges that would become more pressing in the 21st century. An increasing number of water uses place pressure on water supply,

Figure 5.3: Map of Great Lakes Areas of Concern

Source: http://epa.gov/greatlakes/aoc/index.html

demand and water quality. Air pollution, chemical use and release, habitat loss and biological diversity, exotic and invasive species, waste management, and infrastructure needs are all enduring issues which have a negative impact on water quality (IJC 1997). However, despite multi-stakeholder governance arrangements there is little incentive for various users to take cumulative impacts into account (Sproule-Jones 2008), particularly outside their perceived borders.

Thus we arrive at a point where, some 25 years after the implementation of various policy initiatives, water quality objectives have not been met. Many of the indicators of ecological health are mixed, uncertain or even deteriorating (Solec 2007). Progress in many watersheds in the Great Lakes region remains slow, and pollution continues to increase along with population growth and the increasing uses of water in the basin. Over two-thirds of the basin's original wetlands have been lost, thousands of miles of rivers have been impaired, and miles of shoreline have been degraded (GLU 2007).

There have been some transboundary success stories relating to such issues as acid rain, and several indicators of progress in the Great Lakes, such as returns of species on the brink of extinction and some re-establishment of fish and wildlife habitats (Jackson 2006). However, there are also many new and re-emerging issues in the Great Lakes, including new evidence of pharmaceutical chemical pollution, the enduring problem of importing invasive species such as zebra mussels (Sanders and Stoett 2006), and plateaued progress in addressing the "dead zone" in Lake Erie (U.S. EPA 2002). The slow progress in cleaning up the most polluted sites on the Great Lakes is particularly surprising given the longstanding institutional arrangements on the Great Lakes designed to address transboundary water quality issues and the efforts of state and societal stakeholders.

SECTION II: THE TRANSBOUNDARY POLICY RESPONSE

Transboundary management of the vast watersheds shared by Canada and the United States began 100 years ago with the signing of the Boundary Waters Treaty in 1909. The treaty established the IJC as a unique transboundary institution for the resolution of binational water disputes. According to the IJC itself:

> *"No other institution has the IJC's broad mandate or its successful track record in preventing and resolving transboundary disputes around environmental and water-resource issues, and no other institution provides the opportunities for officials from all levels of government, scientists, stakeholders and interested citizens to work together on these issues. The Commission's flexibility and historic emphasis on consultation, joint fact-find, objectivity and independence, and its ability to engage local governments and serve as a public forum are important assets to the parties in meeting the challenges of the 21st century." (IJC 1997)* The transboundary response to water pollution in the Great Lakes is well-documented. As early as 1912, water pollution issues were referred to the IJC for study. While some studies in the 1940s and 50s indicated concern about pollution impacts such as algae-mats and declining fish species, it was not until the 1970s that IJC research culminated in a policy push for basin-wide efforts focused on point source controls in the form of effluent limits for industries and municipal sewage treatment systems. The joint fact-finding and diplomatic capacity of the IJC resulted in the signing of the first Great Lakes Water Quality Agreement (GLWQA) between Canada and the United States in 1972 "a non-binding, good-faith agreement between the two levels of government" (McCulloch and Muldoon 1999), or soft-law transboundary approach to address water pollution.

Point source and clean-up initiatives of the late 1970s and 80s showed that improvements could be made and provided several important lessons beyond the cleanup of localized nuisance conditions. The 1978 GLWQA recognized the need for an ecosystem-based approach and emphasized toxic substances. The renewed agreement in 1987 identified 43 Areas of Concern (AOCs)[1] on the Great Lakes (see Figure 5.3).

These AOCs highlighted the various types of water pollution from heavy metals, pathogens, contaminated sediments, and the increasing number of toxic chemicals in the basin. Together, these pollutants were impairing various ecosystem uses such as the health and reproduction of various species, fish populations and wildlife habitat, human health and other human uses (see Table 5.2).

The 1987 agreement called for Remedial Action Plans (RAPs) to be prepared for all 43 AOCs (see Figure 5.3) to restore 14 beneficial uses in these areas (see Table 5.2). RAPs required multi-stakeholder involvement of citizens, nongovernmental organizations, industry and governments in a two-stage approach: first in assessing water pollution problems in the AOCs, and then developing an implementation plan to address the impaired uses. In addition, Lakewide Management Plans (LAMPs) and other programs and initiatives on both sides of the border were supposed to supplement efforts in AOCs. The eight Great Lakes states and Ontario province have the lead in preparing and implementing the RAPs, which is complemented by input and expertise from other federal agencies as well as local governments, industries, environmental groups and individual citizens (U.S. EPA 2007).

Although the IJC's authority was not expanded beyond its investigative role under the GLWQA, in effect it was given a "standing reference" and "permanent watchdog role" in the Great Lakes (Schwartz 2005). The AOC approach gradually resulted in a shift in focus from IJC-level efforts to a more decentralized approach related to RAPs. In the late 1980s and early 1990s, there had been some progress in RAPs (Hartig and Zarrell 1992; Sproule-Jones 2002, Botts and Muldoon 2005), yet those AOCs shared by Canada and the United States (see Figure 5.3) devised two parallel RAPs that assumed an impermeable barrier down the middle of the shared watershed (Sproule-Jones 2002, 79, 90-103) and had limited binational cooperation.

During the same period there was a proliferation of other organizations and actors involved in transboundary water management and bilateral relations.[2] Under the North American Free Trade Agreement (NAFTA), the Commission for Environmental Cooperation (CEC) was created in 1994, and given powers to make recom-

Table 5.2: Use Impairments in Great Lakes Areas of Concern

- Restrictions on fish and wildlife consumption
- Tainting of fish and wildlife
- Degradation of fish and wildlife populations
- Fish tumours and other deformities
- Bird and animal deformities or reproductive problems
- Degradation of benthic populations
- Restrictions on dredging
- Undesirable algae/eutrophication
- Taste and odour in drinking water
- Beach closings
- Degradation of aesthetics
- Added costs for agriculture of industry
- Degradation of phytoplankton and zooplanktona

mendations on environmental issues including water pollution in any of the three countries in NAFTA. Soon afterward, the Great Lakes Binational Toxics Strategy was signed and co-chaired by the director of the EPA's Great Lakes National Program Office and the director of Environment Canada's Environmental Protection Branch, Ontario Region. The Strategy's goal was to eliminate a targeted set of substances in the basin between 1997 and 2006. This agreement is one which reportedly "forged a stronger relationship" with the NAFTA-CEC Sound Management of Chemicals Working Group (U.S. EPA 2006), causing some concern that the mandate of the CEC might supplant the activities of the IJC (Schwartz 2006).

In addition to these transboundary relations at the federal level, subnational transboundary environmental management interactions were on the rise (Stoett and LePrestre 2006). The Council of Great Lakes Governors (CGLG)—representing eight Great Lakes states and Ontario and Quebec as affiliate members—has had a transboundary mandate under the Great Lakes Charter since 1955. In 2001, the signing of the Annex to the Great Lakes Charter on bulk water removals and diversions as a subnational transboundary agreement not involving the federal governments in Canada or the United States (Heinmiller 2008) indicated that subnational governments were developing capacity related to water quantity issues, transboundary policy efforts outside the auspices of the IJC, and the separation of water quantity and quality policy regimes. Although in the early years of the GLWQA there had also been almost no direct participation of local (municipal) governments (Botts and Muldoon 2005), the designation of RAPs resulted in many local governments becoming involved in AOCs. The Association of Great Lakes and St. Lawrence Mayors and the Great Lakes Cities Initiative in 2003 also indicated growing engagement by local governments (Botts and Muldoon 2005, 163).

With the proliferation of transboundary institutions and agreements in the past 20 years, there has also been a growth in nongovernmental stakeholders. At the transboundary level, perhaps the earliest non-state actors engaged in Great Lakes water quality issues were scientists and researchers. The IJC itself has contributed to the development of various transboundary research and academic networks such as the Great Lakes Science Advisory Board, the Water Quality Board and the Council of Great Lakes Research Managers. In addition, the State of the Lakes Ecosystem Conferences (SOLEC) and the International Association for Great Lakes Research have brought researchers and policymakers together to ensure ongoing research and monitoring.

By the 1970s, several U.S. environmental organizations had established Great Lakes programs (Botts and Muldoon 2005, 43) that evolved into Great Lakes-specific groups such as the Lake Michigan Federation, Great Lakes Tomorrow and Great Lakes United, along with larger and more affluent groups such as the Natural Resources Defense Council and Clean Water Action. All of them developed agendas related to the Great Lakes (Botts and Muldoon 2005, 81).

Virtually all industries and agricultural operations use water and are thus important stakeholders in Great Lakes water management. There are a number of industry associations such as the Council of Great Lakes Industries Association and other industry-specific groups associated with shipping ports, fishing and other commercial uses on the lakes. However, the first two decades of the GLWQA has been characterized by a "lack of industry attention reflecting the sector's limited participation in the Great Lakes community in the first two decades of the agreement's history" (Botts and Muldoon 2005: 101). The early 1990s saw some increased activity by industry associations, particularly related to the toxic chemicals and the debate about "virtual elimination,"

but in many AOCs, industries were not active participants (Sproule-Jones 2002).

At the micro level, watersheds have become the natural boundaries around which networks of state and societal stakeholders form to prevent, assess and remedy water quality issues. The most common nongovernmental stakeholders are local citizens, industrial and agricultural users, local environmental groups, water system professionals, academics and scientists, all of whom became active at the AOC level (Sproule-Jones 2002). However by the late 1990s, the general sense of community between researchers and stakeholder groups in the Great Lakes began to decline (Botts and Muldoon 2005, 161), despite the growth of information and communication technologies that were fostering networks on other fronts.

More recently, there has been some re-engagement of state and societal stakeholders related to the IJC GLWQA review (Botts and Muldoon 2005). As the IJC approaches its centennial and looks forward into its second century, there has been an effort to assess policy efforts and the role of the IJC in transnational water management. When the IJC began operations, the set of transboundary water issues was small. Water diversions for irrigation and hydroelectricity generation were its primary concerns. Although institutions for transboundary environmental management have proliferated both under the auspices of the IJC and beyond, ecosystem-based policy integration has been limited (Rabe and Zimmerman 1995) and significant water pollution and environmental challenges remain.

Even though the Great Lakes constitute a single basin, there are two very distinct domestic policy regimes which have evolved to address water pollution. One cannot fully assess the policy response at the transboundary level without also understanding the national and subnational levels in Canada and the United States.

Water Pollution Policy Efforts in the United States

The laws and policies governing water quality in the United States are based on common law and constitutional rules that grant the legal authority to control water rights and pollution almost exclusively to the states and localities. However, over time, water pollution policy efforts have come to mirror the intergovernmental nature of environmental policymaking in the United States more generally, which has been characterized by "conjoint federalism," whereby state and federal authorities blend and apply concurrently, reflecting the fact that of the 25 federal environmental laws passed between 1960 and 1980, the majority, 18 of them, asserted federal authority on matters upon which states previously held exclusive jurisdiction (Welbourn 1988).

The 1972 Water Pollution Control Act (WPCA) was the primary piece of legislation that altered the federal government's role under the constitutional powers related to interstate waters and resulted in federal funding for states and localities to construct water treatment plants. As another outcome, it established a regulatory and permitting regime for industrial and municipal facilities under the National Pollutant Discharge Elimination System (NPDES). This paralleled a variety of forces prompting increased reliance on states and local governments as regulatory agents in carrying out federal programs (ACIR 1981). The establishment of the Environmental Protection Agency (U.S. EPA) in 1971, the growing research and technical capacity of the environmental bureaucracy (Rosenbaum 1989, 213), and several amendments to the WPCA gradually increased the federal government's "high vertical involvement" in water pollution management (Lowry 1992, 58). State and local officials, enticed by federal dollars, gradually became more receptive to a federal presence in this policy area.

Although the focus remained on point sources and improving municipal sewage treatment facilities, by the mid-1980s, non-point source pollution accounted for nearly two-thirds of the pollutants reaching American waterways, and 33 of the 52 states ranked non-point source pollution as their major water pollution problem (U.S. EPA 1995a, 72). It was also increasingly clear that point source pollution "sticks" were not meeting water quality objectives (Rosenbaum 1991). In 1987, Congress passed the Clean Water Act (CWA) nearly unanimously over the veto of President Reagan, the same year it signed the GLWQA. Additional responsibilities for RAPs and LAMPs and minimum annual appropriations from 1987-2008 were added in Sec.118 of the CWA. In addition to designating the EPA as the lead agency in Great Lakes efforts, Section 118 also established the Great Lakes National Program Office (GLNPO) and Great Lakes Research Office as part of the EPA. Sec.319 of the Act directed states to assess non-point sources in their jurisdiction and develop implementation plans with the assistance of the EPA (Ringquist 1993, 27).

> ...watersheds have become the natural boundaries around which networks of state and societal stakeholders form to prevent, assess and remedy water quality issues.

Despite some retreat in the 1990s, the federal government signed a new Safe Drinking Water Act (SDWA) in 1996 and the Great Lakes Binational Toxics Strategy in 1997, and increased funding under the Clinton administration's Clean Water Action Plan in 1998.

By the late 1990s, the EPA Office of Water, along with the EPA's 10 regional offices and states, tribes, partners and stakeholders, were charged with integrating actions under the CWA, SDWA and Great Lakes efforts through state loan funds and partnerships. By 2000, the EPA began a push toward integrating point source and non-point source efforts under the CWA Sec.303d, which requires states to identify impaired waters through Total Maximum Daily Loads (TMDL)—a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards (U.S., EPA 1993).

Twenty years after the original law was passed, calls were being made for a renewed agenda and commitment to policy efforts under the CWA, from all levels of government (Adler et.al. 1993), in relation to the Great Lakes. By this time, water quality reporting to Congress and state legislatures, and reports from policy watchdogs like the Natural Resources Defense Fund, Great Lakes United and other stakeholder groups, clearly indicated that water pollution efforts were not producing significant results. In response to a very critical report by the federal General Accounting Office (GAO) in 2002, which noted the declining federal and state funding in the preceding 10 years and ongoing disagreement between EPA and the states over responsibility related to the RAPs (Botts and Muldoon 2005, 152), the Great Lakes Legacy Act was signed into law in 2002. Touted as the "the first significant legislation for the Great Lakes in a decade" (Botts and Muldoon 2005, 152), the Legacy Act provides funding and additional support for the GLNPO to take the necessary steps to clean up contaminated sediment in "Areas of Concern located wholly or partially in the United States," and includes specific funding designated for public outreach and research components.

Another GAO report issued in 2003 indicated that after almost $2 billion in spending since 1992 on Great Lakes efforts, and coordination among 33 federal and 17 state programs (Botts and Muldoon 2005, 158), the lack of federal coordination (despite the establishment of GLNPO) and measurable results indicated a need for an overarching strategy for restoration of the Great Lakes. In May 2004, President Bush created the Great Lakes Regional Collaboration (GLRC), which included members of his cabinet, the Great Lakes governors and Congressional delegation, mayors, and tribal leaders. In 2005, the GLRC released the Great Lakes Restoration and Protection Strategy. Although states have made some progress—for example, the Oswego River AOC in New York state became the first AOC delisted on the U.S. side of basin in 2007, the CGLG and Great Lakes Mayors have been critical of forthcoming financial support from Congress and the federal government in efforts related to the nation's water belt (CGLG 2007; GLSLCI 2008). Subsequent reports by the GAO in 2005 and 2008 raised enduring concerns about U.S. implementation capacity.

Water Pollution Policy Efforts in Canada

In Canada, the history of water policy efforts at the federal level is well documented (Pearse 1985; Hoberg 1992; Sproule-Jones 2002; Brooks 2003, Johns and Rassmussen 2008) and stems from a combination of legislation, court decisions, policy directives and funding initiatives under various constitutional authorities. Although various aspects of water management fall within federal jurisdiction, it was not until the 1970 Canada Water Act that the federal government passed its first piece of legislation explicitly related to water resource management, that was "enabling" rather than "regulatory" in nature. The Canada Water Act articulated the federal government's

authority in this policy area and enabled the federal government to reach agreements with the provinces and industry to address water pollution problems (Doern and Conway 1994, 22). In the 1970s, the federal government also began regulating toxic substances under Part III of that Act and the Environmental Contaminants Act, and became involved in water policy through its spending powers and authority over fisheries powers, as well as by providing financial support for the construction and upgrading of sewage treatment plants and related infrastructure in municipalities across Canada.

In response to growing concerns about water quality in the Great Lakes and other watersheds across Canada, in 1984 the federal government established the Inquiry on Federal Water Policy. It made several recommendations concerning the need for new federal water legislation. In response to the "Pearse report," rather than amend the Canada Water Act or develop new legislation, the federal government opted to develop the Federal Water Policy (FWP) in 1987. The FWP simply reconfirmed the federal government's commitment to water quality research and a water infrastructure support role.

The same year the FWP was announced, the federal government signed the 1987 GLWQA and committed to water quality efforts in AOCs and the RAP process. However, the federal role has primarily been channelled through research, funding and other ecosystem-based efforts focused on remediation, clean-up and point sources of water pollution. In 1988, the Canadian Environmental Protection Act (CEPA) was passed, emphasizing the federal government's focus on toxic substance regulation as central to its water quality mandate. Soon after, in 1990, the Mulroney government's Green Plan allocated funding to water quality research and Great Lakes efforts. This was an active, yet short-lived period of federal government efforts related to the environment and water policy.

The fiscal situation during the mid-1990s and the Chrétien government's budget-cutting exercise known as "Program Review" significantly reduced funding for water-related programs and for Environment Canada as the lead agency (Savoie 1998). Two progress reports on the FWP were issued in 1990 and 1994, but water-related policies and programs through Environment Canada witnessed a marked decline (Johns 2000; Botts and Muldoon 2005). Policy analysts have also documented fragmentation of water-related work that has plagued Environment Canada for some time (Doern and Conway 1992) and became so severe in the 1990s that a "Where's Water?" team was assembled to determine whether or not the government's water duties were still being performed (Boothe and Quinn 1995).

Although the scientific evidence was mounting that non-point sources were a significant contributor to water pollution in Great Lakes watersheds, and the United States was initiating a policy response at the federal and state levels, there was very little recognition of this in Canada (Johns 2000; Montpetit 2002). Comparative studies revealed that Canada was lagging behind the United States in terms of water policy efforts (Hoberg 1992; Johns 2000; Montpetit 2002). Although the National Roundtable on Environment and Economy (NRTEE) and other federal departments were involved in developing water quality indicators as part of broader initiatives related to state of the environment reporting (NRTEE 2003), the federal government's capacity even to report on the state of waters in Canada declined.

Even in the aftermath of the water pollution tragedies in Walkerton and North Battleford, Saskatchewan,[3] the priority of federal water issues remained questionable. Instead, those events were viewed as drinking water policy problems for the provincial governments to manage. In 2000, the federal government's Great Lakes Program was renewed for five years as the Great Lakes Action Plan. However, Environment Canada and eight other federal departments reportedly received only $40 million of the $160 million requested (Botts and Muldoon 2005, 149).

In 2002, the Federal Commissioner of Environment and Sustainable Development (CESD) noted the "limited use of federal powers, weakness in basic management and accountability and the politics of federal-provincial relations have all played a part" (CESD 2002, 33) in diminishing the federal water policy role generally and in the Great Lakes specifically. The report also noted that the Minister of Environment had committed $150 million for the Great Lakes program for the years 1995-2000, but only $14.9 million actually went to departments participating in the program (CESD 2002). The report also was critical of the federal government's support of the IJC, noting:

> *"What is the value of making domestic and international commitments when in some cases there is no capacity to deliver? When the federal government signed the GLWQA, for example, it assumed an obligation*

to ensure that action would be taken. The government decided to rely on others, and when others failed to deliver, it did not assume the lead. The time has come for it to either take responsibility for its commitments or change them." (ibid., 52).

The state of affairs concerning federal water policy in Canada during this period has been well documented and debated (Johns 2000; Lee and Perl 2003; Boyd 2003; Botts and Muldoon 2005; Bakker et.al 2007; Sproule-Jones et.al. 2008). In the aftermath of another very public water pollution tragedy in the Kashechewan First Nation in northern Ontario in 2005, the federal government announced funding of $40 million for water programs, the same level it had committed in the previous five-year period (Botts and Muldoon 2005, 149). That same year, a Senate Committee characterized the federal role in the area of water pollution management as "in retreat" (Senate 2005). Despite a large federally-sponsored water policy conference in 2006 (PRI 2007), there were no indications of change under Stephen Harper's minority federal government, which came to power with no environmental agenda. A quick overview of federal water policy efforts gives a clear indication that the federal government was not fulfilling its role related to GLWQA, and that given the soft-law, non-binding status of international and intergovernmental agreements, there was not much recourse.

In Canada, similar to the United States but even moreso, one cannot get a fair picture of water policy and its impact on transboundary policy efforts on the Great Lakes without examining the intergovernmental and subnational levels. Bilateral Canada-Ontario intergovernmental agreements (COA) have been in place for the Great Lakes since 1971, providing a means of pooling resources to work with a variety of partners at the local level in Great Lakes AOCs. However, criticisms of progress and action related to these agreements are well-documented (CIELAP 1999; Botts and Muldoon 2005; Sproule-Jones 2002, 2008). During the 1990s, both federal and provincial environmental bureaucratic capacities related to water were diminished. Water pollution efforts related to the Great Lakes fell off the Ontario-federal agenda.

The most recent 2007-2010 COA is the seventh such agreement and builds on previous agreements to continue to reduce pollution, clean up degraded hot spots, deal with invasive species and protect the biodiversity of the Great Lakes. The current COA also includes two entirely new areas: determining the impacts of climate change and protecting sources of drinking water. The Ontario government has committed $32 million to this latest COA (MOE 2007), yet policy efforts at the provincial level related to the Great Lakes have declined in the past decade.

The period of the Harris government in Ontario saw a particular decline "in effect, diluting the Great Lakes focus and losing much of its capacity to take an active role in Great Lakes matters" (Botts and Muldoon 2005, 141). The Ministry of the Environment (MOE), watershed-based Conservation Authorities and other agencies with water-related mandates felt a significant impact from funding cuts. According to one report, MOE business plans during this period barely mentioned Great Lakes efforts, and in 1997, the Ontario MOE laid off the coordinators for almost all of the provincially-led RAPs (CIELAP 2000). Reduced efforts were framed around point sources of water pollution and non-point sources were largely ignored (Johns 2000, Montpetit 2002), that is, until the Walkerton tragedy in May of 2000 brought the status of provincial water policies into focus.

The resulting public inquiry led to many recommendations related to drinking water (O'Connor 2002), and the provincial government committed to implementing all of these recommendations based on a multi-barrier, "source-to-tap" approach. Several new pieces of legislation have been passed, including the Nutrient Management Act, the Safe Drinking Water Act (SDWA) in 2002, and the Clean Water Act (CWA) in 2006, which emphasizes watershed-based, multi-stakeholder source water protection at the local level. In the past five years, the McGuinty government has been committed to implementing all of Justice O'Connor's recommendations and has significantly increased funding for drinking water policy in the province. However, only this most recent piece of legislation has explicitly made connections between provincial drinking water policy efforts and water quality in the Great Lakes, and thus reconfirmed a commitment to the federal-Ontario agreement as follows:

"More than 70 percent of Ontario's population use the Great Lakes directly as a drinking water source, while 98 percent of Ontario's population depends on the waters of the Great Lakes-St. Lawrence Basin for their drinking water. The CWA provides a comprehensive framework

for protecting drinking water in the Great Lakes basin. It addresses the Great Lakes themselves, tributaries that flow through the watersheds and ground water that sustains many streams and also discharges directly into the lakes. The agreements affecting the Great Lakes must be considered in the development and implementation of local source protection plans. As Ontario partners with municipalities and conservation authorities to protect drinking water in a watershed-based approach through the Clean Water Act 2006, the Great Lakes will be a major focus and beneficiary." (MOE 2007)

In terms of stakeholder efforts in Canada, some companies and industry associations have been involved in Great Lakes RAP efforts, but their involvement has ebbed and flowed alongside government efforts and, in some instances, introduced roadblocks to addressing AOCs (Sproule-Jones 2008). Although environmental groups have been very active in the Great Lakes and water quality policy more broadly, the Great Lakes has not been the organizing theme for any national groups in Canada, and the environmental community was "on hold" from the mid-1990s to the mid-2000s (Botts and Muldoon 2005, 166). The Canadian Environmental Law Association, Pollution Probe, Sierra Legal Defense (now Ecojustice), Environmental Defence Canada and the Canadian Institute of Environmental Law and Policy all have water programs. Many more local groups have Great-Lakes related mandates, particularly in AOCs (Sproule-Jones 2002), and some are networked with U.S.-based organizations like Great Lakes United and the more recently-formed transboundary coalition called "the Blue Group" related to the IJC GLWQA review (Botts and Muldoon 2005).

SECTION III: COMPARATIVE ANALYSIS: IMPLICATIONS FOR THE GREAT LAKES AND TRANSBOUNDARY GOVERNANCE

Transboundary institutions and efforts have come some distance in the past 30 years. There was a time when a more centralized IJC approach generated significant research and policy responses (Botts and Muldoon 2005). More recently, the decentralized approach taken by RAPs in AOCs also has made progress, particularly in documenting the state of water quality in many watersheds, but has not provided the necessary results in terms of capacity to address persistent water pollution problems associated with multiple uses in the Great Lakes, not to mention future water pollution challenges. From this analysis, it is apparent that policy effort and capacity vary significantly between the United States and Canada, and this has important implications for transboundary efforts and outcomes.

Fundamentally, water use, pollution problems and policy instruments in the United States and Canada resemble each other. As has been noted, "despite the overall similarity in approach, however, there are important differences between the two jurisdictions' regulatory frameworks, reflecting each nation's institutional make-up and regulatory style" (Hoberg 1992, 254). This comment supports earlier observations that there is little evidence of policy convergence in environmental policy (Hoberg 1993, Howlett 1994) and supports earlier findings that U.S. policy efforts in the area of water pollution management have been stronger and more centralized than efforts in Canada (Hoberg 1993; Johns 2000). In the United States, although "conjointness" varies at the subnational level depending on the capacity of states and the organizational capacity of societal interests (Lowry 1992; Ringquist 1994; Bacot and Dawes 1997; Johns 2000), federal legislation and policy efforts have prompted a more vertically and horizontally-integrated policy approach to water pollution efforts at the watershed level. Canada's intergovernmental water pollution policy efforts have been less legalistic, less binding and therefore subject to the economic cycles and the whims of different federal and provincial governments.

In the United States, federal initiative and efforts in terms of legislation and program involvement have been comparatively high. Clearly, the U.S. government has taken a more active role than Canada in water pollution management efforts generally and in the Great Lakes more specifically. In many ways, the institutional capacity and intergovernmental cooperation that evolved for

the administration of point source pollution management regimes have cleared the way for intergovernmental involvement in non-point source pollution and watershed-level efforts in AOCs. This capacity stems from the legislative, technical and administrative capacity of the U.S. EPA, which has prompted and fostered state policy capacity.

While for some proactive states, federal involvement in Great Lakes efforts only added to state efforts that were underway, for others, federal legislative action and loan funds have been the stimulus for state and local action. However, the evolution from the initial centrally-driven approach to a more cooperative decentralized approach was also fostered by the maturation of capacity at the state and local levels (Lester 1990) and by broader administrative reform efforts under the Clinton and Bush administrations. However, though capacity and efforts are comparatively higher in the United States than in Canada, most Great Lakes watersheds in the United States are still not meeting water quality objectives (U.S., EPA 2006b).

In Canada, the federal government is charged under the IJC with implementing the GLWQA, yet the province of Ontario is the primary implementer. Federal involvement has been comparatively low. This is consistent with observations in other environmental policy areas in which, "in striking contrast to the U.S., the Canadian federal government has not subsidized provincial administration of environmental programs, either conditionally or unconditionally" (Harrison 1996, 41). The federal government and Environment Canada have predominantly supported Great Lakes pollution control efforts through support for the IJC, funding through intergovernmental agreements, toxic substance control efforts, research, funding restoration projects in AOCs, low-levels of agro-environmental program funding, and the rhetoric of pollution prevention and the ecosystem approach.

The 1990s, in particular, were a period in which federal, provincial and local policy efforts were retreating from a focus water quality, water stakeholders were receiving less public funding and turning their attention to other pressing environmental and economic issues, and the public was increasingly disengaged from Great Lakes issues. The past five years has witnessed a reinvestment in water policies in Ontario (particularly drinking water policies) but it remains to be seen whether the new COA or Ontario's legislative efforts and particularly the CWA will improve Canada's contribution to water pollution and transboundary policy efforts on the Great Lakes.

Also, whereas the IJC has broadly defined water pollution problems, U.S. jurisdictions have more closely designed efforts related to the goals of drinkable, fishable, swimmable waters using an ecosystem and watershed approach, and more recently have tried to integrate policy goals with those outcomes. The U.S. Clean Water Act was well ahead of any legislation and policy in Canada in terms of broadening the policy frame to include both point and non-point sources of pollution, as defined in terms specific to Great Lakes efforts. And subsequent legislation related to the binational toxics strategy and the Legacy Act has continued to indicate a sustained commitment to Great Lakes efforts by U.S. policymakers and stakeholders.

In contrast to this, the federal government in Canada, while officially adopting similar goals for the Great Lakes, does not have any "hard law"' devoted to articulating goals and resources related to transboundary efforts and the GLWQA. The Canadian government also has deferred to Ontario which, for much of the 1990s, unfortunately had very little water policy capacity. Even after significant post-Walkerton efforts related to drinking water goals, water pollution and Great Lakes efforts, as articulated by the IJC and GLWQA, are not the shared focus of Ontario's efforts.

Another area in which the United States has exerted more effort and developed substantial capacity is in the area of scientific capacity, measurement and reporting on water quality. This technical expertise from the U.S. EPA is shared and collaborative in the intergovernmental context. Some attribute this to more adversarial policymaking focused on best-available technologies and reporting which requires a certain level of scientific capacity in contrast to ambient standards. This, in turn, has fostered a demand for scientific information outside the bureaucracy, as well (Bocking 2006). Although science has also been central to Evironment Canada's role in the Great Lakes, its technical capacity is more limited and there is less intergovernmental collaboration on science and policy. It is also not evident that Canadian policymakers have utilized the growing technical and policy expertise that is publicly available through the EPA, state bureaucracies, U.S. think tanks and environmental groups, all of which have generated considerable research data related to water quality. Although there is some evidence that Canadian environmental groups

have reached out to their U.S. counterparts and injected technical expertise into new policies like the SDWA in Ontario, the sustained engagement and capacity of Canadian environmental groups in Great Lakes efforts remain in question. To some extent, institutional and policy capacity differences make it difficult for environmental organizations to form effective cross-border alliances (Alper 1997).

However, despite the fact that U.S. policymakers and stakeholders have exerted more effort related to water pollution generally and to the Great Lakes specifically, progress on both sides of the border in addressing AOCs has been slow. This indicates that a number of other factors are important in explaining the enduring challenge of water pollution in the Great Lakes. In addition to questions about policy capacity at the national and subnational levels, there are other factors which are possibly having an impact. Both countries' policy efforts remain medium-based (Rabe 1999; Johns 2000) and transboundary and domestic institutions and efforts continue to reflect a divide between water quantity and water quality policy regimes. Given the foretold impact of climate change on the Great Lakes, there is an emerging imperative to address this dichotomy. Related to this is the need to move beyond reactionary water pollution policy approaches based on remediation and clean-up to prevention approaches. Both countries have tried to do this in terms of source protection, but the United States seems to be further along in this policy transition related to integrating efforts to reduce both point and non-point source pollution through the TMDL framework and public reporting.

Both the United States and Canada have explicitly adopted a watershed approach and agree that this is the scale at which transboundary, national and local action needs to occur. However, the institutional arrangements in each country are dependent on government leadership and stakeholder engagement. In both countries, there is evidence that capacity of the administrative state and state-society partnerships have become more important in addressing water pollution problems, but the ability to sustain concerted efforts over long periods of time is in question. The engagement of environmental groups is well documented, but there is little empirical evidence of the engagement of industry users and municipalities across the basin. What does all this mean for water pollution efforts in the Great Lakes in the future?

SECTION IV: FUTURE TRANSBOUNDARY POLICY OPTIONS

There are several different policy options which flow from this analysis and have been proposed to improve the transboundary and domestic efforts in the Great Lakes basin, some as a result of recent stakeholder consultations by the IJC itself (Bails et.al. 2006, GLU 2007). For purposes of this chapter, just a few will be reviewed: the need for institutional innovation, the need for new agreements, legislation and policies, and the need for renewed policy commitment and stakeholder engagement to address the increasing complexity of water issues in the basin. In each instance, reflections are offered on how national and subnational capacity can be taken into consideration.

Institutional Innovation

There does not seem to be a need for more transboundary and watershed-based institutions to address water pollution. However, making these institutions work better is an imperative. One approach would be to improve the role and capacity of the IJC itself. There have been numerous proposals on how this could be done without politicizing the IJC's role. One policy proposal has been to establish permanent IJC watershed boards accountable to the IJC Great Lakes Water Quality Board. IJC boards have been used traditionally to provide a mechanism for dispute resolution and such boards could formalize multi-stakeholder efforts at the watershed level, possibly by prioritizing certain AOCs or merging existing boards to better integrate water quality and quantity issues. However, for a number of reasons, the creation of such boards has had limited appeal (Schwartz 2006) and there is a danger they might constitute just one more institution fragmenting collective action at the watershed level.

New Agreements, Legislation and Policies

Institutional arrangements and agreements are in place to address water pollution in the Great Lakes basin, but

there is a need for renewal. The GLWQA has not been updated since 1987. In 2005, the IJC initiated a multi-stakeholder consultation process to review the 1987 GLWQA, given that scientific knowledge and ecological conditions have changed dramatically in the 20 years since the last agreement was signed. In a special report released in October 2006, the IJC recommended that U.S. and Canadian federal authorities should replace the current GLWQA with a shorter and more action-oriented document. The IJC also recommended a new agreement should include a commitment to developing a Binational Action Plan with achievable goals and timelines, measures for evaluating performance, and provisions for monitoring and reporting, all to provide for greater accountability related to cleanup of the Great Lakes (IJC 2006).

In the transboundary realm, an action plan can involve a form of "soft"' accountability whereby transboundary and domestic non-governmental organizations (NGOs), water stakeholders and external governments shame and pressure other jurisdictions for action. The approach involves developing some external standards and indicators which constituents use to praise leadership and pressure laggards for action, and can also involve third party independent review (Botts and Muldoon 2005:222).

In its 13th Biennial report in 2006, the IJC set out the need to develop an effective Accountability Framework and urged the governments to present a draft framework by June 2008, hold a Great Lakes Accountability Summit in the summer of 2008 and accelerate their review of the GLWQA. Internationally and in Canada, there is debate over whether this type of external accountability contributes to a "race to the top" or "race to the bottom" (Harrison 2006). However, it may work to prompt a comparative assessment of effort between the two nations at the federal and subnational level.

National and subnational jurisdictions need to have the technical capacity to contribute to this type of accountability agreement. The United States is more endowed with this capacity to measure and report. Whereas policy makers in Canada may initially find their contribution to this approach more limited given the lack of capacity in this area, that in turn may prompt capacity-building in Canada and Ontario and cross-border networking.

A renewed transboundary agreement with soft-binding accountability features could also serve to refocus water policy in Canada. Many groups are calling for a new national water strategy and for more federal leadership. The federal-Ontario agreement, like other intergovernmental agreements, is non-binding, yet perhaps could be more focused on accountability. Related to this option, the interactions of scientists and researchers have always been very significant in agenda setting and in formulating transboundary policy efforts. Engagement of these stakeholders and others, such as large think tanks and NGOs with research capacity, could enhance a new transboundary agreement based on accountability outcomes.

Stakeholder Engagement

Under a new transboundary agreement, efforts could focus on reinvigorating efforts in AOCs and revitalizing the RAP process with special attention to altering the behavior of stakeholders. This could involve prioritizing a few of the binational Canada-U.S. AOCs to improve transboundary interactions and efforts of these various water users and stakeholders at the watershed level. Renewing efforts in AOCs may provide opportunities for more transboundary scientific and policy knowledge sharing and re-thinking of stakeholder engagement. Since government-led agencies rarely have sufficient expertise and sustained resources to move the agenda, they need to view themselves as facilitators or co-managers in watershed-based efforts (Sproule-Jones 2002). This, however, would require a shift towards more fundamental rebalancing of water uses in the basin in which other stakeholders, for example industries and communities, would be required to change their behavior significantly.

Environmental groups are also calling for a renewed commitment in the basin. In 2007, the "Blue Group" released a Great Lakes Blueprint outlining eight key priorities for all levels of government and stakeholders in the basin. They include: improving governance, enabling effective public participation, connecting water quality and quantity, ecosystem-based stewardship, eliminating pollution, upgrading sewage infrastructure, halting aquatic invasive species, and protecting water levels and flows (GLU 2007). These priority areas reflect the reality that both current water pollution problems and those of tomorrow are increasingly complex. Both point and non-point sources and quantity and quality regimes need to be part of a comprehensive, ecosystem-based approach stemming from the multiple uses and users of water in the basin.

Water quality problems in the past have been defined as technical problems requiring technical solutions at

point source. In reality, water policies are connected to many other policy areas such as climate change policy, industrial policy, agricultural policy, energy policy and health policy. Policy makers realize that water pollution problems vary on a number of different and complex dimensions: scientific character, scope, and risk (in terms of human health and ecosystem health). A new policy instrument mix is now increasingly evident in both Canada and the United States, but effort and capacity in both countries is not meeting current and future challenges. Most agree on the transboundary priorities for the basin but shy away from the serious rebalancing of uses and more fundamental governance reform required to meet these challenges (Sproule-Jones, Johns, Heinmiller 2008).

SECTION V: CONCLUSION

Despite longstanding transboundary institutions and agreements aimed at convergence, water pollution policies are framed differently in Canada and the United States. At the transboundary and intergovernmental level, governance takes the form of soft law, whereas at the national and subnational level, asymmetries exist between the hard law of each nation. There is little evidence that transboundary networks of political and bureaucratic officials are significant in terms of policy implementation. And there are few institutional incentives for a transboundary rather than domestic orientation in terms of policy implementation.

Canada tends to take a more decentralized approach entailing asymmetries in effort over the years. Despite this, there is similar impact of transboundary governance and only very limited progress in cleaning up AOCs and meeting water quality objectives in the Great Lakes basin. There is little evidence of policy convergence (Bennett 1991) between Canada and the United States in terms of water pollution policies, coupled with scant evidence of transboundary policy networks or lesson drawing (Rose 1993, 2005), and limited environmental outcomes despite a proliferation of transboundary institutions and significant efforts at goal-setting.

As noted earlier, in the introduction to this volume, this chapter does not suggest that the United States has had better results, but it does assert that Canada has been a policy laggard relative to water pollution cleanup efforts in the Great Lakes. Recognizing these asymmetries is important to future transboundary efforts and potential cross-border collaboration. The findings also raise concern about the capacity of existing governance arrangements to adapt to emerging transboundary environmental challenges in the future.

As the transboundary dimension of water pollution management becomes increasingly important in the Great Lakes, new approaches that link quantity and quality and social and ecological systems at various scales are needed (Blatter and Ingram 2001). There seems to be a consensus that a focus on watersheds hold the most promise in the next generation of policy efforts, but connecting efforts on the transboundary scale is the challenge. In the United States, intergovernmental, multiagency partnerships are more developed at the watershed level and overall, the United States seems more institutionally-endowed to rise to this challenge. However, alongside the significant engagement of environmental bureaucracies and groups, there is a need for other users to engage in the environmental goals of the basin.

The time has come to begin writing the next chapter of the water pollution policy story in the Great Lakes basin. In June 2009 it was announced by U.S. Secretary of State Hillary Clinton and Canadian Minister of Foreign Affairs Lawrence Cannon that the United States and Canada will renegotiate the GLWQA last signed in 1987. Clearly, an important part of moving on to this next phase is reflecting on national and subnational efforts to date so that transboundary institutions and efforts in the future will be more successful.

NOTES

1. An Area of Concern is a designated watershed in the Great Lakes which has been identified as having many of the use impairments in Table 5.3.

2. See Mark Sproule-Jones' chapter in this volume for appendix of binational governance arrangements outside the GLWQA and IJC.

3. In March-April 2001 as many as 7,000 people in North Battleford Saskatchewan became ill from Cryptosporidium pathogen which entered the drinking water system from raw surface water from the North Saskatchewan River.

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Chapter 6: Policy Changes on Canada's Rivers: Different but not Isolated

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This comparison of policy changes in Canada versus the United States sheds light on expectations regarding environmental change in general and river management, specifically. The author hypothesizes that, relative to the United States, Canadian policy changes are more likely to be driven by subnational bureaucrats, are to a greater degree dependent upon fortuitous alignments of interests and institutions, and are less quickly emulated and spread among jurisdictions in need. These concepts are explored in the context of case studies in British Columbia and Ontario where, indeed, change occurred at the subnational level, and was largely dependent on the efforts of small groups of dedicated mid-level bureaucrats. While there were some dramatic results (e.g., dam removal), they stemmed, to some degree, from good timing and circumstances, and are unlikely to be emulated anytime soon. In fact, energy potential may be the dominant issue frame in Canadian river management for years to come, the author speculates, and dam removal, which would effectively reduce hydropower, is not likely to be discussed. Nonetheless, Canada is not isolated from the United States and ideas that cross national borders and change the way issues are framed can have an impact.

Significant changes to river management policies have occurred in Canada in recent years. In 1996, a small group of scientists demanded and developed a water use plan that served to revive the nearly dormant Alouette River in southern British Columbia (B.C.). In 2000, Ontario government engineers removed the Finlayson Dam from the Big East River.

As important as these cases are, they do not necessarily signal a new era in river management in Canada similar to the one evolving in the United States. This paper addresses two related questions. First, how do policy changes in Canada differ from those in the United States? Second, are such changes isolated from American influence?

I will argue that several factors determine that Canadian policy changes will occur differently than in the United States. I examine these arguments in the context of changing river management policies in British Columbia and Ontario. Canadian policy changes will be more driven by subnational bureaucrats, more dependent upon fortuitous alignments of interests and institutions, and less quickly emulated by other jurisdictions than policy changes in the United States. At the same time, policy change in Canada is not completely isolated from that in the United States. Ideas can easily cross the shared international border and bring about results by changing the ways in which issues are framed.

This paper is organized as follows. The first section uses literature on policy change and on Canadian-American differences to generate specific hypotheses. The second section provides a brief review of the American experiences in river management to provide some empirical context. Then case studies of the policy changes in British Columbia and Ontario are presented as vehicles for assessing the hypotheses.

THEORETICAL EXPECTATIONS ABOUT POLICY CHANGE

Most of the existing work on policy change focuses on changes in one specific nation. The most cited works concentrate on the United States (for edited collections, see Sabatier 1999 and Baumgarter and Jones 2002). Nevertheless, a growing body of literature assesses policy change in Canada (Howlett 1997, 2002; Mawhinney 1993; Pralle 2006; VanNijnatten and Lambright 2002). Comparative analyses of policy changes in Canada and the United States are not that common, which is surprising in light of the many similarities between these countries in terms of wealth, history, traditions, and political institutions (though see Borins 2000; Bryner 1999; Harrison and Hoberg 1994; Hoberg 1992; Lowry 1994; Rabe 1999, 2004; VanNijnatten 1999). Only a few studies offer systematic expectations regarding policy change, and many of those anticipate little cross-national variation. Instead, many studies anticipate a degree of convergence between policy evolution in Canada and the United States (Hoberg 1991; Howlett 2000; Johnson and Beaulieu 1996). For example, Borins (2000) studies over 200 innovations in Canada and the United States and finds few differences. Despite these findings, several key differences between the two nations do foster expectations of variance on the most fundamental issues of policy change.

Primary Actors: The United States and Canada

One obvious goal for most policy change studies is to determine who is driving the changes. To anticipate the primary actors in policy change in Canada requires understanding some fundamental differences between Canada and the United States.

First, the system of federalism in Canada is much more emphatic about the decentralization of policy responsibilities to the subnational level than is the case in the United States (Harrison 1996, 2002; Hoberg 1992; Pralle 2006; Rabe 1999, 2004; Skogstad and Kopas 1992). This is true in most areas of public policy, certainly environmental issues where "provincial governments have clear and extensive authority" (Harrison 2002, 125; Cameron and Simeon 2002, 60; Hale 1998, 448).

Second, public agencies in Canada have a substantial degree of autonomy, even though this has not translated to significant power for federal offices (as discussed in the next paragraph). The Westminster framework of government in Canada has always fostered discretion to public agencies (Campbell 1983,295; Doern 2002; Franks 1987, 98; Hessing and Howlett 1997, 86, 176). Further, Canadian officials have historically been less constrained by formal requirements than their American counterparts (Harrison and Hoberg 1994, 12). The combination of decentralization and bureaucratic discretion suggests a potentially powerful role for provincial bureaucrats.

Third, many Canadian federal institutions have not developed to have as much power and influence as those in the United States (Cameron and Simeon 2002; Doern 2002, 111; Hale 1998; Hessing and Howlett 1997, 145) For instance, Environment Canada never has achieved the level of importance as the U.S. Environmental Protection Agency (EPA) (Doern 2002, 111). This lack of federal agency power reinforces the reliance on subnational bureaucracy for policy changes.

Fourth, Canadian interest groups tend to form locally and are typically not as active at the national level as their American counterparts. Interest groups, notably those advocating environmental causes, have thus been slower to develop and less influential nationally in Canada than in the United States (VanNijnatten 1999; Wilson 1992, 2002). The Canadian political process is "less open" and "less pluralist" than the American, thus making it harder for interest groups to gain access and influence with policy makers (VanNijnatten 1999, 270). Further, most Canadian interest groups have had difficulty overcoming financial limitations (Hessing and Howlett 1997, 219; Wilson 1992, 113; 2002, 46). As a result, interest groups tend to "operate in the peripheral zones" of policy and their impact is limited (Wilson 1992, 120; Glenn 1999, 144).

One hypothesis, then, is that this combination of relative autonomy for bureaucrats, decentralization, and relatively weak national interest groups suggests that policy change in Canada will be more dependent on the actions of "visionary" subnational bureaucrats than in the United States (Borins 2000, 69; Hale 1998; Martin 2001; Pralle 2006; Rabe 2004; Volden 2006). This hypothesis is anticipated in the first chapter of this volume and evident in many of the other chapters.

Table 6.1: Factors Conducive to Policy Change

FACTOR	ALOUETTE RIVER	FINLAYSON DAM
Available process of governance	Electric Systems Operating Review (ESOR)	Environmental Assessment (EA)
Inside knowledge and receptivity	MOE Whistle-blowers	MNR Engineers
Outside pressure	First Nations ARMS	Support from fishermen No opposition from logging
Transplanted idea	Minimum instream flows	Dam removal
Favorable framing by media	"Stolen water" headlines	No "noise" from few property owners

Likelihood of Significant Change

A second focus of many policy studies involves the likelihood of significant change. The traditional wisdom that public policy achieves change only incrementally (Lindblom 1959) is no longer accepted by many social scientists. Scholars have provided compelling theories of dramatic, substantial change in the United States (Baumgartner and Jones 1993; Birkland 1997; Kindgon 1984; Sabatier and Jenkins-Smith 1993) and thorough case studies of significant changes in specific policies over time (Bosso 1987; Fritschler 1989; Schulman 1975). The obvious question is the degree to which policies change significantly in Canada as well.

The reliance on provincial bureaucrats to pursue policy change comes with no guarantees that such actions will be successful. Instead, successful policy alteration by provincial bureaucrats depends upon a fortuitous alignment of a wide range of factors, similar to Kingdon's (1984) convergence model. This is largely due to the facts cited above, e.g., that national interest groups and/or national political agencies that could provide some degree of insulation for bureaucrats are less institutionalized in Canada than in the United States. Not surprisingly, decentralization of environmental policy in Canada has not produced a substantial amount of innovation in absolute terms or in terms relative to the United States (Harrison 1996; Paehlke 2000; Rabe 1999; VanNijnatten 1999). Left to their own devices, many provincial politicians would rather not disturb existing, traditional economic relationships (Harrison 1996; Rabe 1999 Skogstad and Kopas 1992).

Nevertheless, windows of opportunity for substantial change do open. A second hypothesis is that if certain factors align in promising ways, pro-change advocates can pursue significant actions. These factors include an established process of governance that can serve as a vehicle for change, pro-change bureaucrats and receptive political authorities on the inside of the policy-making institutions, supportive interest groups on the outside, and media framing of issues in ways that are conducive to change. Such alignments have occurred in Canada as well as in the United States (Howlett 1997, 28). These factors provide the framework summarized in the first column of Table 6.1. Such alignments are rare.

The Diffusion of Innovations

A third area of study regarding policy changes involves diffusion of innovations. How quickly and thoroughly are new policies copied or emulated from one jurisdiction to another? This issue has attracted attention from social scientists for decades (Mooney 2001; Rogers 1983; Walker 1969)

Diffusion of change spreads more slowly in Canada than in the United States for several reasons. The relatively weak national interest groups do not provide as much opportunity for communication across jurisdictions and persuasion in Canada as they do in the United States The less developed federal bureaucracy does not provide as much support and dissemination as public agencies can in the United States. As the first chapter in this volume states, the U.S. government typically fosters more uniform behavior between the states

than the Canadian federal government does among the provinces. Related, the wide variance in attitudes, processes, and dialogues among Canadian provinces slows the possible spread and adoption of innovations. As a result, as one analysis concluded, "the different provincial programs each seem to stand alone" (Carroll and Jones 2000, 289). Thus a third hypothesis is that policy innovations in Canada spread more slowly than in the United States.

The Role of Ideas in Framing Issues

A fourth focus of attention in recent studies of policy change involves the role of ideas. Recent work suggests that ideas can play a significant role, in policies ranging from state-level regulation to international trade (Berman 2002; Blyth 2003; Goldstein and Keohane 1993; Lieberman 2002; Mooney 2001; Parsons 2002; Sabatier and Jenkins-Smith 1999). How, specifically, can ideas motivate policy change? Some scholars assert that a change to some issue or event external to the policy system is crucial to significant alteration of existing goals or priorities (Baumgartner and Jones 1993; Birkland 1997, 22; Sabatier 1993, 22-23). Ideas can be that disruptive external force if they affect the basic framing of an issue.

Frames highlight some element of reality regarding an issue to the point of affecting perceptions of that issue (Entman 1993; Kahneman and Taversky 1984; Kamieniecki 2006, 59). For instance, a river may be framed in terms of economic utility or environmental health. Policy makers can use framing to transform perceptions of an issue over time. One way to do so is to introduce new ideas that bring new knowledge or recognition of alternative processes. Such an impact is more likely with environmental issues if the imported idea is supported scientifically (Heikkala and Gerlak 2005, 587; Howlett 2000). Indeed, studies have shown that efforts to frame an issue in ways perceived to be not supported by "hard science" are not likely to succeed (Kamieniecki 2006, 60; Libby 1998). Thus, change advocates can import scientifically-supported processes or ideas that enable them to reframe issues in ways that have not previously been emphasized.

The border between Canada and the United States is not a significant obstacle to the transfer of ideas. Common problems, such as air pollution or climate change, facilitate interactions that can foster relationships that communicate ideas. Institutions such as the International Joint Commission (IJC) offer forums for exchange. Language is not a barrier. Policymakers on both sides of the border read the scholarly literature from both nations. Again, all this is particularly important for the transfer of scientific processes or knowledge that can be crucial to framing policy changes in ecosystem management. A fourth hypothesis then is that policy change in Canada may well be impacted by ideas that have American roots.

"The border between Canada and the United States is not a significant obstacle to the transfer of ideas. Common problems, such as air pollution or climate change, facilitate interactions that can foster relationships that communicate ideas.

Summary of Expectations for Policy Change

We have framed certain expectations for policy change in Canada based on the following premises. Change is reliant on the actions of provincial bureaucrats. The success of innovations depends upon rare fortuitous alignments of interests, institutions, and ideas. Policy changes are more likely to be localized and dispersed rather than rapidly diffused within the country. Finally, innovations are not developed in complete isolation but rather benefit from the flow of ideas across national as well as subnational borders.

RIVER RESTORATION IN THE UNITED STATES

River management policies in the United States have arguably entered a new era. Until the 1990s, American rivers had been managed almost entirely for economic and political purposes (Ferejohn 1974; Reisner 1987; Worster 1985). People modified and managed rivers with dams, levees, dikes, and other structures to serve the economic purposes of navigation, irrigation, and hydropower. Politicians, often acting through the Corps of Engineers or the Bureau of Reclamation, used river projects to benefit constituents as well as water and power interests in a tight sub-government that defied challenges (Clarke and McCool 1996; Reisner 1987). As one piece of evidence for the scope of these structural modifications, today over 75,000 dams stand on American waterways (U.S. Army Corps 1996). The American experience provided a model of structural engineering on rivers for nations all over the world.

Attitudes and policies toward rivers in the United States have changed in recent years. The fights in the mid-1960s over proposed dams in the Grand Canyon area ushered in a new era in river management and arguably in environmental policy generally (Nash 2001, 231; Reisner 1987, 295). Congress aborted the Grand Canyon dam proposals and almost immediately followed with passage of the Wild and Scenic Rivers Act. Challenges to traditional management of rivers intensified in the 1970s and 1980s with greater environmental awareness of the ecological damages caused by river modifications and with increasing economic realism concerning the costs and benefits of structural engineering (Mazmanian and Nienaber 1979; McCully 1996; Palmer 1986).

Two ideas have dominated recent changes in American river policies. The first "new river management paradigm" is that minimum instream flows are essential to maintain certain levels of biodiversity (Postel and Richter 2003, 45). This argument gained momentum with the development of tools for analyzing and prescribing necessary flows. Over a period of 15 years, biologists and hydrologists at Colorado State University and elsewhere, working with the U.S. Fish and Wildlife Service, developed the Instream Flow Incremental Methodology (IFIM) as a computer modeling tool for describing flow regimes on specific waterways under different management alternatives (Bovee 1982; U.S. Geological Survey 2008; Zappia and Hayes 1998).

Second, while minimum flows provided for alterations to operations of dams, change proponents began promoting a more radical idea on severely impacted rivers across the country, the actual removal of those structures. During the 1990s and 2000s, policymakers have successfully removed hundreds of dams on rivers all across the country (American Rivers 1999; Grossman 2002; Lowry 2003, 2005). The most notable of those removals occurred on the Kennebec River in Maine when policy makers removed a functional hydro dam (Edwards) over the owner's objections in 1999.

This brief review is not meant to suggest that all river management in the United States has changed. Indeed, efforts to change policies on big rivers such as the Colorado and Missouri have achieved only limited results. Nevertheless, change advocates have removed hundreds of dams, restored large areas of river habitat, and have simulated seasonal flows on many waterways. The movement to restore American rivers is widely diffused and emulated (Lowry 2003, 2005; Postel and Richter 2003).

RIVER RESTORATION IN BRITISH COLUMBIA

The province of British Columbia (B.C.) is blessed with an abundance of powerful rivers. That power, however, has also tempted anthropogenic use, particularly for the generation of hydroelectric energy. During the twentieth century, hydro producers, supported by the B.C. government, built large dams on most of the province's' waterways. Today, B.C. Hydro operates 41 generating plants on 27 different rivers and lakes, including three of the 10 largest hydro operations in Canada (Glavin 2002, 21; Natural Resources Canada 1997, 72). These dams, by blocking fish passage and appropriating vast amounts of water, have had a significant impact on the Province's rivers and associated ecosystems. The consequences for fish species, particularly salmon and steelhead, have been severe (Ashley 2006; Rosenau and Angelo 2000, 2003).

Any efforts to change traditional behavior would face serious obstacles due to the perceptions of B.C. Hydro and the provincial government that changes in system operations and/or capital expenditures for fish passage infrastructure would result in revenue losses. In 1996, when the following story unfolds, hydropower provided 94 percent of the Province's electricity (Natural Resources Canada 1997, 61).[1] B.C. Hydro is also part of the network that sells electricity to the United States, particularly subsequent to the electricity deregulation and the integration of transmission facilities that occurred in the 1990s (Froschauer 1999). Further, as part of its licensing agreements, B.C. Hydro contributes more than half a billion dollars per year to the provincial government (Glavin 2002, 21). Not surprisingly, the B.C. government has encouraged the utilization of Canadian rivers, especially with the conservative, pro-development Social Credit and British Columbia Liberal parties in power during most of the 1970s, 1980s, and 2000s. Any potential federal role would be constrained by traditional decentralization as well as the fact that while federal authorities have potential interest in fish protection, the province has nearly complete jurisdiction over water, as mandated in the 1867 Constitution Act.

Despite all this evidence in favor of the status quo, significant changes to B.C. river management policies have occurred in isolated instances. A handful of change advocates, notably provincial bureaucrats with the assistance of a few local activists, initiated such changes because they offered the potential for renewal of the province's waterways. As hypothesized, these pro-change advocates received very little help from national interest groups or federal agencies, and were successful in their efforts due to a rare constellation of factors and the importation of an idea from the United States.

It all started in the 1990s with an official assessment by B.C. Hydro of the system operations for its generation stations. The New Democrats, having taken office in 1991, ordered this province-wide low-profile review of the operations of hydro stations called the Electric Systems Operating Review (ESOR). The review was meant to simply assess whether plant operations might be tweaked to produce some environmental benefits without substantial cost to the company (Glavin 2002, 21). The New Democrats realized that over-fishing, excessive forest harvesting, and other land-use practices had impacted the rivers, but they expected that certain changes to plant operations, such as slightly increased minimum flows downstream of dams and modified ramping of flows as generators are turned on or off, could provide substantial benefits to fish.

As background, B.C. Hydro is supposed to operate its dams and generating stations according to one or more licenses issued under the British Columbia Water Act specifying how much water they can use for their operations. These licenses are quite specific in respect to the amount of water that can be used, as well as when and where. The Canada Fisheries Act is supposed to ensure that dam facilities maintain flows for fish, but other than a short period in the 1980s following some court cases, the federal agency responsible for enforcing the act (Canada Fisheries and Oceans) has largely looked the other way. The expected costs to reconfigure system operations for hydro-electric generating stations was expected to be exorbitant.

In pursuing the ESOR, Marvin Rosenau, a fisheries biologist then with the B.C. Ministry of the Environment (MOE), examined the historical hydrograph on the Cheakamus River and compared it to the water usage by B.C. Hydro and the conditions found within its water rights. He found that the company was "way out of compliance with their water license."[2] Recognizing that B.C. Hydro had not attained legal ownership of all of the water it was using from the Cheakamus, Rosenau, acting for the MOE, applied for a license for 140,000 acre-feet, the average overage that the company was using to which it was not entitled. Under the "first in time, first in right" system of water appropriation, the MOE thus established a prior claim to the water. Ken Ashley, a scientist with MOE's fisheries research section, worked with Rosenau to check past records on the Cheakamus and concluded that B.C. Hydro had been abusing their allocation and short changing the government of millions of dollars in water license rental fees for years.[3] Revenues associated with these resource extractions are often shared with the local Indian communities through negotiation. The local First Nations on the Cheakamus became aware of the potential revenues for the unlicensed water on this river. Indeed, B.C. Hydro estimated the amount of power being generated by the unlicensed water to be $8.0 million Canadian, not a trivial sum in 1995.

These two bureaucrats built an informal coalition for change. They recruited the support of the B.C. government's Habitat Conservation Trust Fund (an arm's-length funding agency dealing with habitat issues) and the fed-

eral Fisheries and Oceans Canada in order to obtain funding to undertake a formal engineering analysis of the Cheakamus Generating Station (Ward and Yassein 1996). They also obtained money to initiate a second, independent audit of a number of other B.C. Hydro operations throughout the province that were suspected of being out of compliance with their water licenses. The subsequent assessments were termed Ward reports following from the name of the engineering company undertaking the analyses. When the first Ward report was released, it caused a media frenzy and a "Watergate-type" explosion within the B.C. government (Anderson 1996; Glavin 2002, 21). As Rosenau told me, "We then had a sympathetic media running headlines about 'stolen water', we had public support, we had anger from First Nations, and we had legal grounds."[4] Internal memos and e-mail messages show that the Cheakamus controversy made B.C. officials realize that this issue could raise significant problems politically.[5]

Not surprisingly, B.C. Hydro officials targeted Rosenau and other bureaucrats as troublemakers and demanded the government relent in its investigations (Glavin 2002, 22). The government ordered Rosenau to lock up the second Ward report. Nevertheless, issue framing was changing. Whereas hydropower had previously been seen as relatively benign environmentally as well as economically beneficial to the province, this pro-change group had shown that not only had hydro operations devastated provincial waterways, they were also cheating First Nations and provincial taxpayers out of fish, water, and the revenue from using more than their share allowed under the license.

Nearly simultaneous with the reviews of B.C. Hydro water licenses, the place for real action, and the seminal pioneering effort for policy change, occurred on the Alouette River in southwestern British Columbia. Once a beautiful, fish-laden waterway, the Alouette had been severely damaged over time by logging and then damming and development. Engineers dammed the river in the 1920s and diverted most of the flows into a neighboring watershed for hydro-electric generation, releasing very little water into the lower Alouette. As a result, the river languished. It's once- strong natural flows which once produced a mean annual discharge of nearly 1,000 cubic feet per second (cfs) and fish populations in the hundreds of thousands had been reduced to trivial flows occasionally down to two cfs and salmon runs of only 20,000 or less, most of them in recent years hatchery-spawned.

In the 1960s, a few local citizens formed what has evolved into the Alouette River Management Society (ARMS) to demand minimum flows that would allow salmon migration. In fact, the Alouette needed water for more than just migration, including spawning of adult salmon and rearing of juvenile fish. Because the water license on the Alouette did not prescribe minimal flows, no requirement existed regarding release discharges for fish. However, as the pressure from ARMS mounted in the 1980s and 1990s, led by a former B.C. Hydro engineer named Geoff Clayton, , the company unilaterally but only modestly increased the minimum flows from 2 cfs to 12 and then 20. These increased flows were much too low for optimal fish production and the efforts of Clayton and ARMS gained little traction until the mid-1990s.

The window of opportunity for change on the Alouette came in the mid-1990s. In 1994, Clayton and Rosenau met by chance at a meeting convened by B.C. Hydro concerning the Alouette and its fish flows. They soon realized they were working toward the same goals. Rosenau still had access to the Ward investigations, including an analysis of the Alouette River drainage indicating that B.C. Hydro was out of compliance with its water license on this watershed. Further, he had established a relationship with Mark Angelo, the media-savvy head of the B.C. Outdoor Recreation Council, on a number of river-related issues. Angelo was ready to blow the cover off the Ward investigations at any time. In addition, while the coverage of the Ward Reports had attracted media attention from a variety of sources, another member of the media named Terry Glavin was involved specifically on the Alouette in a strategically important way. Glavin is an award-winning journalist who has written extensively about First Nations and several conservation issues. He has also been closely connected to the Sierra Club and other conservation groups. His First Nations connection to the Alouette was to help them deal with treaty negotiations. The Alouette River flows within the territorial boundaries of the Katzie First Nation. Any potential change to waterways that affects First Nations territorial waters is part of treaty negotiations. In this case, Glavin, already sympathetic to the restoration cause, was advising the Katzie First Nation. Legal issues were not limited to First Nation claims. Clayton had also contacted the Sierra Legal Defense Fund to take possible action against B.C. Hydro for the ecological devastation of the Alouette. In

this way, a small group of individuals representing several facets of society formed a powerful informal coalition

This coalition motivated the provincial government to start a consultative process to develop a set of system operations in order to more fully protect fish. As Rosenau says, "We blackmailed the government into taking action."[6] Potential changes were significant and included providing more water, adjusting flushing flows to remove sediments from spawning beds, altering ramping rates, and temperature modifications (Vanderwal 1999).

An imported idea further reframed the issue of river management to emphasize biodiversity needs. As mentioned previously, American scientists had developed the Instream Flow Incremental Methodology (IFIM) process to determine necessary factors for fish species survival such as depth, velocity, and habitat. The Alouette policy makers explicitly borrowed the methodology, agreeing that the consultative process should be based on the best science available to make trade-offs between power and fish flows. Utilization of this methodology as a scientifically-supported tool enabled framing of the issue to emphasize ecosystem health rather than power generation. Now armed with a powerful idea, a constellation of factors conducive to policy change was in place. As Rosenau told me, "The stars were aligned."[7] The second column in Table 1 summarizes those factors.

The dialogue between B.C. Hydro and the agencies and interest groups lasted several months (Vanderwaal 1999). The possibility of dam removal was quickly dismissed. As Clayton said, "If we had pushed that option, we would have lost credibility."[8] Ultimately, the parties reached consensus and B.C. Hydro took the recommendations to the British Columbia Comptroller of Water Rights for inclusion into a system operations plan. In 1996, the B.C. government released the draft water use plan (WUP) for the Alouette hydro-electric generation station, the first plan for such facilities in the province. The objective of the plan was to legally institutionalize the detailed operational aspects of a water license in order to protect aquatic ecosystem values as well as other social and economic impacts associated with water diversion, storage, or withdrawal.

The Alouette WUP called for increasing the downstream flows of the river to the point where today minimal flows average 90 cfs. Most of this water comes from a pipe located under the dam that takes discharge from deep in the reservoir and releases it downstream. B.C. Hydro further committed to $200,000 per year for monitoring of fish migration. The government also committed to reviewing the plan every 10 years, a number chosen to allow for two five-year salmon cycles. In addition, the scientists pursued lake fertilization of the aquatic ecosystem upstream of the dam. The final piece of the puzzle, releasing flows from the surface of the reservoir, occurred first in the spring of 2005. B.C. Hydro agreed to manage the flows of the reservoir, on an experimental basis, by releasing discharges from the surface spillway at the dam rather than the low-level discharge outlet. This was important because salmon smolts do not migrate out of reservoirs at great depths, rather on the surface of the water until they find an outlet stream. Thus the low-level pipe would prove incapable of passing the small salmon if and when the watershed was restored to salmon spawning and juvenile rearing.

The results have been impressive, even dramatic. The growth of fish populations has been remarkable. Monitoring in 2004 revealed counts of over 1.5 million fish representing 16 species downstream of the dam (Cope 2004,1). Adult chum salmon escaping to the river below the dam increased from about 400 adults in 1964 to nearly 300,000 in 2006. Indices of steelhead returns suggested that this species almost doubled post-flow release.[9] Most dramatically, the summer of 2007 produced a seminal event when adult sockeye salmon, having been released as juveniles using the surface spillway in 2005, made the return all the way up the Alouette River, from the ocean to the dam, for the first time in 80 years. While Clayton and Rosenau were proudly showing me the restored river in 2007, the latter concluded, "Relative to what it was ten years ago, the Alouette is substantially restored."[10]

The Alouette WUP was just the start to policy change on B.C. rivers. In 1997, the provincial legislature passed the B.C. Fish Protection Act, affording at least a nominal commitment to restoring fish species. Of more operational importance, the Alouette pilot proved the model for other rivers. The water use plan concept was later formalized into a major government initiative for all B.C. Hydro water licenses and hydro facilities (B.C. Hydro 2006; Rosenau and Angelo 2000). B.C. Hydro authorities committed to developing WUPs for each of their 34 hydroelectric stations, to then be approved by the provincial comptroller of water (Bemister 2007). By 2007, 23 facilities at least started the process (B.C. Ministry of Environment 2007). This could be a seminal change in river management in that there exists the potential

to apply this process not only to B.C. Hydro licenses, but also to other large projects affecting fish as well. The Greater Vancouver Regional District is expected to shortly use a version of the process to modify operations of the Cleveland Dam, a stream-impoundment structure built in the 1950s to provide a water supply to Vancouver that has severely impacted fish migration and production on the Capilano River.[11] Policy makers have also recently developed WUPs for non-hydro projects in B.C. as well as rivers in other geographical areas (Rosenau and Angelo 2000; Ryder 2005). [12]

The ultimate results from these changes won't be clear for years. However, natural conditions on several rivers, in addition to the Alouette, have displayed considerable improvement since the WUP process began. If nothing else, the WUP initiation raised awareness of river issues in general in the B.C. province. This may have contributed to the protests against a proposed series of dams on the Upper Pitt River and the decision by the provincial government in early 2008 to abort the project.

RIVER RESTORATION IN ONTARIO

While dam removal was not a viable option for policy change on most B.C. rivers, it has received considerable discussion in Ontario. Several reasons are possible. First, while British Columbia gets nearly all its electricity from hydropower, Ontario relies on hydro for only 29 percent (Natural Resources Canada 1997, 61). Only 288 of the 2,125 dams in Ontario are operated by Ontario Hydro. Efforts to remove the other, non-hydro dams do not face objections about lost energy. Second and related, most of the hydro dams in British Columbia are quite large, while many of Ontario's dams are much smaller. Among the 10 largest hydro stations in Canada, none are in Ontario (Natural Resources Canada 1997, 72). Third, as the following story describes, policy makers have removed a dam in Ontario after a systematic environmental review process, thus providing a model, whereas efforts to remove dams for environmental reasons in B.C., notably on the Theodosia, have met with little success.[13] This is not to suggest that dam removal has been a frequent occurrence in Ontario. Instead, as with water use planning in B.C., dam removal occurred as the result largely of the efforts of provincial bureaucrats who took advantage of favorable circumstances and the adoption of an idea from the United States. Also, as with the B.C. policy changes, the effort to decommission dams remains within the Province and faces an unclear future.

The Ontario government owns over 300 dams in the province, some of them quite old and unsafe. Prior to 1999, people had occasionally removed dams for safety reasons or structure failure, but deliberate removal for environmental reasons had not been a policy option. Nick Paroschy, a senior project engineer for the Ministry of Natural Resources (MNR), said the idea was sparked when "we saw a tape of the Edwards Dam [in Maine] removal and thought we could do this."[14] Paroschy's anecdote suggests much of the documentation about the Finlayson removal cites the American experience. In the United States, dam removal has become a relatively common and accepted alternative for dealing with ageing dams" (Donnelly, King, and Phillips 2005, 1). This opened up possibilities and changed the entire framing of the issue. Rather than just considering the option of repairing old dams, an expensive and often inconclusive process, policy makers envisioned the possibility of entirely removing the structures. The American experience showed that such an option was supported by science and potentially quite effective.

Importation of the dam removal idea occurred at an opportune time. The MNR had a process in place called the Class Environmental Assessment (EA). In Ontario, this represents an evolution of a procedure that began in the 1970s in several provinces and with the federal Environmental Assessment and Review Process (Fenge and Smith 1986; Skogstand and Kopas 1992). The EA established a multistage procedure whereby potential MNR projects, including dam decommissioning, "can be planned and carried out without the need for project-specific approval" by the legislature (Ontario MNR 2003, vii. 6). According to Derryk Renton, senior environmental planner for MNR, the EA process regarding the Finlayson Dam occurred entirely at the provincial level.[15]

The alignment of factors that made Finlayson Dam an ideal candidate for decommissioning are summarized in Table 1. The dam, a five meter-high concrete gravity control structure, had been built in the 1950s to assist

logging operations in north central Ontario. The dam created a shallow lake of substantial surface area, flooding 39 hectares of natural vegetation and negatively impacting fish species. One of the affected species was brook trout, the most popular fish among local sportsmen. This created a source of local support for the dam removal option.

The logging industry had declined in the region, thereby removing the major economic reason to keep the dam. Further, unlike the nearby Distress Dam, another candidate for removal, the Finlayson reservoir had very few property owners. Indeed, according to Paroschy, only one person objected on the latter whereas the Distress "had several property owners who made a lot of noise."[16]

Finally, the situation involving sediment at Finlayson was conducive to removal. The mitigation of sediment is often the most important physical obstacle to dam removal. At Finlayson, most of the sediment had accumulated in the upper portion of the reservoir and thus removal of the downstream dam would not cause a significant problem.[17] Renton, Paroschy, and others in the MNR were looking for a candidate dam for decommissioning and "Finlayson was our best bet for removal."[18]

The MNR went through the process to remove the Finlayson Dam in 1999 and 2000. They conducted numerous studies and collected all the necessary scientific data and then took the case to the public according to the EA guidelines. They provided a range of alternatives for altering dam operations as well as removal. Although removal was not the cheapest option, "it was deemed to provide the greatest overall benefit when intangible issues such as the restoration of the natural river habitat were accounted for" (Donnelly, King, and Phillips 2005, 3). Thus, the removal option received critical scientific validation. The MNR engineers, working with Acres International, removed the structure in the summer of 2000. This was the first known, documented case of a dam removal in Canada following a systematic process (Donnelly, King, and Phillips 2005; Hatch Acres 2005).

Removal of the Finlayson has had a major impact on the Big East River. Even after just one year, monitoring showed that the 'riverine system has been restored" and fish populations were renewed (Acres and Associated 2001). By 2005, several of the scientists involved in the removal emphatically proclaimed it a "complete success" (Donnelly, King, and Phillips 2005, 5). When I visited the site in 2006 with Paroschy, the Ontario MNR engineer, he proudly showed me a beautiful river coursing through a meadow with substantial growth of new vegetation in an area that had been flooded behind the dam. As he said, "Now this is a river instead of a reservoir."[19]

Consistent with the third hypothesis in this paper, however, the success of the Finlayson Dam removal has not inspired many other such actions throughout Ontario or Canada as a whole. Paroschy and the other scientists involved with Finlayson had hoped to do Distress as well, but settled for some creative modifications to the structure that facilitated greater fish passage.[20] The MNR also went through the entire EA process to consider removal of the Thornbury Dam, a structure on the Beaver River originally built in 1855. The Thornbury obstructs fish passage and by 2000 was in need of extensive repairs. As with Finlayson, the MNR presented several options. An impressive 54 percent of respondents favored the alternative of decommissioning, a response nearly double that of all the alternatives involving retention with upgrades combined (Ontario MNR 2002, Table 2.2). Nevertheless, intense pressure from some local citizens resulted in rejection of the removal option and expensive modifications instead. As Renton admitted of the EA process, "It's not a vote."[21]

Other possible removals have also been rejected. Indeed, a major controversy erupted over the Springbank Dam in London, Ontario in 2003. Pollution, fish devastation, poor water quality, and some damage led to a full EA process. Although removal of the dam was a viable option, it was rejected after the city expressed their preference for repair instead (Corporation of the City of London 2004; Chung 2007). As of 2007, the MNR was pushing for legislation that would make decommissioning of old dams more likely (Chung 2007). However, as Paroschy said of dam removal efforts in Ontario, "We're serious about dam removal until somebody resists and then it's hard."[22]

Policy makers have removed very few Canadian dams for environmental purposes. Aside from the assessments of dams in British Columbia and Ontario discussed in this paper, "other jurisdictions of Canada have made little progress in this area" (Sentinelles 2002, 9; Donnelly, King, and Phillips 2005). Similarly, Kurt McAllister, a biologist with the federal Fisheries and Oceans agency, when asked if there was momentum nationwide to consider decommissioning, answered: "Not really, we would try to upgrade before removing."[23] Representatives from hydro companies, resource agencies and academia

have been asked why Canada has not emulated the United States in dam removals and have given similar answers. Ed Wojczynski of Manitoba Hydro said, "We don't do dam removals. The local people want them to stay because they've adjusted to them being there."[24] Consistent with that view was the comment of Ontario MNR official Darry K. Renton, who observed that local citizens are reluctant about removals. "The only thing that will make them happy is the dam they've always had," Renton said."[25]

Perhaps the most respected river biologist in Canada, Stewart Rood of the University of Lethbridge, told me in late 2005, "We don't have the dialogue about dam removal that they do in the States."[26] Without national interest groups or federal agencies encouraging people to adjust their attitudes and behaviors, actions like that taken at Finlayson are likely to remain isolated and rarely even discussed.

CONCLUSION

The case studies from British Columbia and Ontario largely support the hypotheses derived from the literatures on policy change and Canadian-American differences. First, in Canada, policy change is occurring mainly at the subnational level, with actions largely dependent on small groups of mid-level bureaucrats such as Rosenau and Ashley in British Columbia and Paroschy and Renton in Ontario. Second, policy changes in Canada can be dramatic, but substantial alterations to traditional behavior are only likely when there is fortuitous alignment of relevant factors. While some of this alignment is fairly random, much of it is designed by change advocates themselves, reminiscent of the role that policy entrepreneurs play in alleviating the randomness in Kingdon's (1984) model. Third, changes in Canada are less likely to be nurtured and disseminated through national interest groups and federal agencies than are changes in the United States. Fourth, policy change is not isolated in Canada but can be impacted by ideas that cross national borders and change the way issues are framed.

What does this mean for the future of river restoration in Canada? Those rare alignments of favorable conditions may be even less frequent in the next few years if for no other reason than the escalating price of fossil fuels. Those prices, and the perception that hydropower does not contribute to global warming, will continue to enhance the attractiveness of hydro as an energy source. Thus, energy potential may be the dominant frame in Canadian river management for years to come. Reducing reliance on hydropower is not likely any time soon. Removing hydro dams will rarely even be discussed. Even just altering hydro operations to foster healthier ecosystems will be a challenge for change advocates and reform-minded bureaucrats.

NOTES

1. Hydro provides 64% of electricity for Canada as a nation (Natural Resources Canada 1997: 61).
2. Interview with Rosenau, 7/18/2007.
3. Interview with Ashley, 7/19/2007.
4. Interview with Rosenau, 7/18/2007.
5. For instance, an e-mail to Rosenau from the Assistant Deputy Minister dated July 3, 1996 admitted, "the minister was not too pleased with the lack of action by the Comptroller's office on Cheakamus over the past years." The Comptroller is the government official with legal power over water licenses.
6. Interview with Rosenau, 7/18/2007.
7. Interview with Rosenau, 7/18/2007.
8. Interview with Clayton, 7/18/2007.
9. Personal communication with Rosenau, 8/17/2007.
10. Interview with Rosenau, 7/18/2007.
11. Interview with Ashley, 7/19/2007.
12. Specifically, managers are using WUPs on rivers in the Okanagan basin.
13. Mark Angelo has led the charge to decommission Theodosia, but in 2007 his colleague Marv Rosenau told me that most momentum had largely dissipated.
14. Interview with Paroschy, 8/2/2006.
15. Interview with Renton, 8/1/2006.
16. Interview with Paroshcy, 8/2/2006.
17. Interview with Paroschy, 8/2/12006; see also Donnelly, King, and Phillips 2005: 2.
18. Interview with Paroschy, 8/1/2006.
19. Interview with Paroschy, 8/2/2006.
20. Interview with Paroschy, 8/2/2006.

21. Interview with Renton, 8/1/2006.
22. Interview with Paroschy, 8/2/2006.
23. Interview with McAlister, 11/29/2005.
24. Interview with Wojcznski, 11/19/2005.
25. Interview with Renton, 8/1/2006.
26. Interview with Rood, 11/22/2005.

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Chapter 7: Multi-jurisdictional Governance of the Great Lakes Fishery: Can A Nonbinding Agreement Work?

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Great Lakes Fishery Commission

Political jurisdictions rarely are congruent with the natural resources they govern, and management of fisheries in the Great Lakes basin is a case in point. The international border transects four of the five Great Lakes and the region's fisheries are managed not by the United States and Canada, but by eight states, the province of Ontario, and several U.S. tribes. This chapter explores the historic and institutional evolution of existing governance arrangements and their roots in "soft law," with a particularly close examination of the multilateral, nonbinding Joint Strategic Plan for Management of Great Lakes Fisheries. Evidence for the success of this approach comes from 62 interviews with current and former Great Lakes fishery management participants as well as direct observations of the management process at work. Authors contend that the Joint Strategic Plan works because it is inherently flexible and can respond to fluctuating natural conditions, that it coexists with and respects participants' existing, closely-guarded sovereignty and independence, and it contains meaningful mechanisms to foster cooperation and heighten the chance that its actions will be implemented. Realistically, any type of agreement, whether binding or otherwise, requires its parties to comply with and implement its terms, the authors point out; if such compliance was not expected, an agreement would not be necessary. However, the Joint Strategic Plan also appears to work under these circumstances because it is fed by epistemic communities, or a network of professionals with recognized expertise and competence within the fisheries domain, who have aligned their shared goals, vision and sense of identity. This community is supported by officials from participating jurisdictions, who regularly interact and create an atmosphere of fresh thinking, ongoing cooperation, improved policies, and commitment to shared decisions.

In 1925, long before "ecosystem management" came of age, future Supreme Court Justice Felix Frankfurter and his colleague James Landis observed that natural resources create their own boundaries, independent of political borders. "Regions, like the Southwest clustering about the Colorado River, or the States dependent upon the Delaware for water, are less than the nation and are greater than any one State" (Frankfurter and Landis 1925). States, they said, would have to come up with creative ways to share and protect such multijurisdictional natural resources. This reality creates governance challenges because political jurisdictions rarely are congruent with the natural resources they govern.

Management of fisheries in the Great Lakes basin is a case in point. With an international border that runs through four of the five Great Lakes, the basin's eight states, the province of Ontario, and several U.S. tribes, it is not the two federal governments or an overarching institution that manage the lakes' fisheries, but instead eight states, the province of Ontario, and several

U.S. tribes. The evolution of law since the days of European settlement has left these nonfederal governments with primary authority over their fisheries (Dochoda and Jones 2002; Gaden 2007). Because the Great Lakes fishery is a large, shared resource, the individual nonfederal jurisdictions also realize that some degree of cooperation is not only inevitable but also desirable. As such, governance of Great Lakes fisheries occurs on two levels: individually, through the natural resource departments of the nonfederal governments, and collectively through a multilateral, nonbinding agreement called A Joint Strategic Plan for Management of Great Lakes Fisheries (or "Joint Strategic Plan").

Barry Rabe (2008) asks in Chapter 1 whether it is possible to conceive of serious cross-border engagement and collaboration, given the historic tensions and asymmetries between Canada and the United States. This chapter extends that question a step further and investigates whether the 11 nonfederal provincial, state, and tribal agencies who manage Great Lakes fisheries can work together effectively and why they prefer a nonbinding agreement over a binding one.

The relationship we discuss is not one of federal government to federal government, rather, it focuses on the nonfederal entities who, in a sense, often behave like sovereign nations. Understanding the voluntary, cooperative nature of the Great Lakes fishery management regime requires determining the sentiments of the participants themselves as they voluntarily cooperate in the regime. To gain insight into this aspect of governance, the results of 62 semi-structured interviews with current and former Great Lakes fishery management participants were used as well as direct observations of the management process at work.

We conclude that, yes, serious cross-border engagement is possible through a nonbinding agreement. For decades, the Joint Strategic Plan has functioned effectively because it contains mechanisms to heighten the chances that actions under the plan will be implemented. The plan is "soft law" in a legal sense because it does not bind, rather it was established specifically to not supersede subnational sovereignty. In the Great Lakes region, a nonbinding fisheries agreement is most appropriate because fishery managers who participate in the Joint Strategic Plan want to be flexible in their response to fluctuating natural conditions; a binding agreement would limit, and not improve, cooperation by being inflexible and constraining. Moreover, managers believe a process that focuses on seeking and advancing shared goals is more valuable than a process that constrains behavior, even though a binding process might enhance compliance. Above all, managers are well aware that historical and political realities of diffuse political authority and guarded independence in the region are such that a binding agreement would be out of the question.

"Because the Great Lakes fishery is a large, shared resource, the individual nonfederal jurisdictions... realize that some degree of cooperation is not only inevitable but also desirable.

While the managers acknowledge that the nonbinding plan does not compel action, they do believe it changes behavior. They believe it contains meaningful mechanisms to foster cooperation, thus heightening the chances that the shared policies will be implemented. Also, the participants believe the role served by the Great Lakes Fishery Commission (GLFC) as process-facilitator is enough to keep them committed to their decisions without a binding force. The soft law approach, overall, appears to be successful in Great Lakes fishery governance because officials from a particular jurisdiction interact regularly with peers from other jurisdictions, which creates the atmosphere of fresh thinking, ongoing cooperation, improved policies, and commitment to shared decisions.

FISHERY GOVERNANCE AND THE JOINT STRATEGIC PLAN

The five Laurentian Great Lakes of North America comprise a lucrative fishery worth at least $7 billion annually (ASA 2008). The region has had a rich history of native fishing from the time of human habitation and commercial fishing since European settlement. Recreational fishing started in the late 1800s and burgeoned by the middle of the twentieth century. It was boundary decisions and treaties during the late 1700s and early 1800s that created the current jurisdictions bordering the lakes: two nations, eight states, the province of Ontario, and several tribes. Through enumerated powers, ownership rights, court cases, precedent, and legislation, each of the nonfederal jurisdictions would retain or attain the authority to manage its section of the resource, consistent with limited federal involvement (Gaden et al. 2008). These authorities are generally understood and accepted, though they are not always exclusive. The nonfederal authority includes establishing harvest regulations, issuing fishing licenses, stocking fish, enforcing the law, and conducting fisheries assessment. The nonfederal jurisdictions operate through their own agencies (e.g., Departments of Natural Resources) to carry out fishery management.

While the people of the Great Lakes basin observe political boundaries, fish routinely cross governance borders, creating the possibility of chaos and significant conflict over management and harvest. In fact, for much of the early history of Great Lakes fishery management, the multiple jurisdictions showed little interest in harmonizing their fishery policies and instead engaged in conflicting and unsustainable practices that led to serious decline of the resource (Bogue 2000; Dempsey 2001). Between the 1880s and the 1940s, the nonfederal governments rejected or ignored no fewer than 25 proposals to create formal, overarching agreements or mechanisms to manage the fishery at the regional level because such proposals infringed on state and provincial rights (Fetterolf 1980; Gallagher et al. 1942). Prior to the mid-twentieth century, nonfederal governments were seemingly more interested in protecting their sovereignty over their fishery than protecting the fishery itself.

This untenable fishery governance regime began to change around the 1940s, when a crisis of epic proportion, the sea lamprey invasion, jolted the jurisdictions out of parochialism. Starting in 1921, sea lampreys entered the upper Great Lakes from the Atlantic Ocean through shipping canals and began to lay waste to the binational fishery through predation on native fishes. Fishers watched in horror as sea lampreys destroyed their livelihood; governments were helpless given a lack of management techniques for sea lamprey and a poor history of cooperation across boundaries. The crisis prompted Canada and the United States to establish the Great Lakes Fishery Commission (GLFC) by treaty—the 1954 Convention on Great Lakes Fisheries—to combat the sea lamprey problem as well as promote research and management for sustainable fisheries. Although the nonfederal jurisdictions jealously guarded their independence over fisheries, the formation of the Commission was acceptable because it did not intrude on subnational management authority (Fetterolf 1980). Instead, the treaty focused on combating a common problem and on ways in which cross-border collaboration could be enhanced.

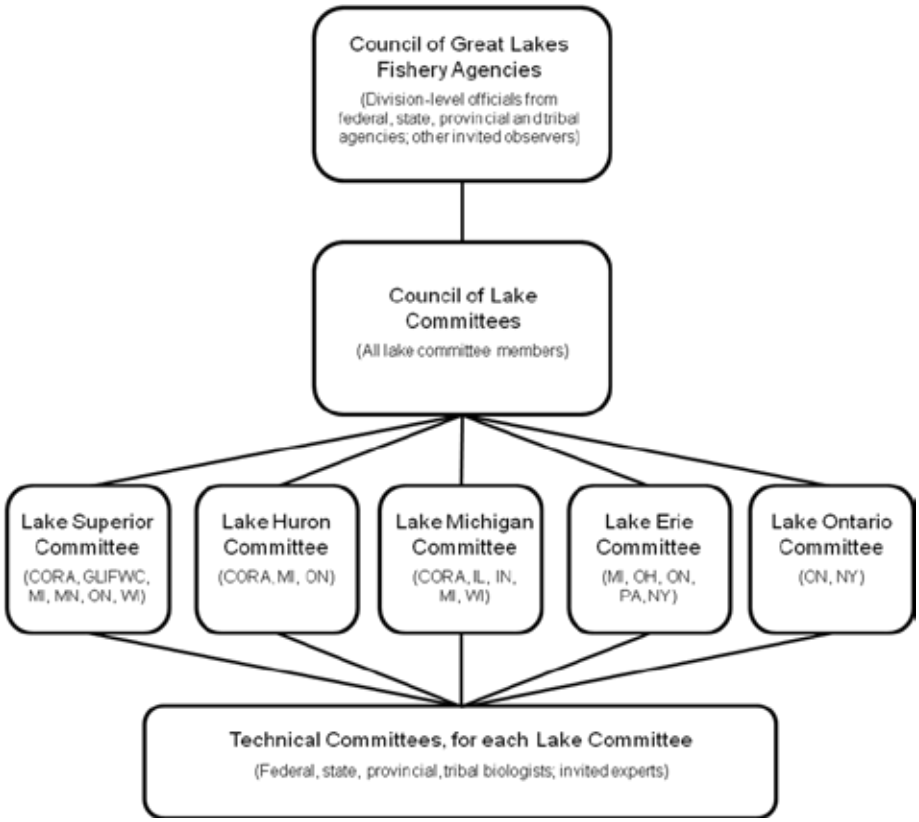
The Commission, urged by its enabling treaty to establish working relationships, formed "lake committees" in 1964 as a place for state, provincial, and federal agencies[1] to discuss matters and share information. These committees were the first, permanent, multijurisdictional arrangements for cooperation in Great Lakes fishery management. By 1981, noting the need to be more strategic in policy and more defensive in fending off federal intrusion (Gaden 2007), the jurisdictions created the nonbinding, regional arrangement, or Joint Strategic Plan for Management of Great Lakes Fisheries, to help them identify and work toward shared objectives. Like its role in forming the lake committees in the 1960s, the GLFC would serve as the neutral force to help develop and implement the Joint Strategic Plan. The Commission helped provide legitimacy to the process and helped the agencies progress toward their shared goals. Because the plan is nonbinding, it does not impinge upon, reduce, or abrogate the authority of the individual jurisdictions. The participants are not bound to the decisions in a legal sense but are nevertheless expected by other participants to adhere to the decisions made through the plan.

The Joint Strategic Plan is largely by, and for, the nonfederal jurisdictions and is specifically designed to facilitate their intergovernmental relations. The nonbinding nature of the agreement means it is only as effective as the signatories wish it to be. The plan is "strategic," meaning it establishes processes and strategies for intergovernmental relations but does not outline specific fishery initiatives. For

example, agencies might agree to develop fishery objectives through the plan, but the plan itself does not specify those objectives. The process is based on consensus and all members must accept (or at least be able to live with) a decision before the decision can move forward. This helps avert the possibility that the geographic size of a jurisdiction might dictate whether its members will dominate or be dominated by others. While simple reality means some jurisdictions will have more resources or larger stakes in a policy than others, consensus nonetheless serves as a leveler of the playing field, allowing minority opinions the chance to be vetted and requiring that they be addressed.

The lake committees are the action organizations used to implement the plan.[2] Under the plan, high-ranking officials from the nonfederal agencies on each lake meet as a group to coordinate their management responsibilities. For example, managers from Lake Huron jurisdictions, which include Ontario, Michigan, and the Chippewa-Ottawa Resource Authority, meet as the Lake Huron Committee. To facilitate the generation of science and integrate the work of the field biologists into management, each lake committee has at least one technical committee to provide scientific advice. Above the lake committees exists a Council of Lake Committees, comprising all members of the lake committees. The Council reviews and discusses Great Lakes fishery issues from a basin-wide perspective. Over the Council of Lake Committees exists a Council of Great Lakes Fishery Agencies, comprising division-level officials from provincial, state, tribal, and federal agencies. This group considers process matters and high-level strategic matters from a basin-wide perspective. Overall, this structure (Figure 7.1) is intended to promote the translation of science to management, to develop common interjurisdictional management policies, and to address basin-wide issues.

Figure 7.1: Committee Structure of Joint Strategic Plan for Management of Great Lakes Fisheries.



The Great Lakes Fishery Commission facilitates this process. CORA=Chippewa-Ottawa Resource Authority, GLIFWC=Great Lakes Indian Fish and Wildlife Commission, IL=Illinois, IN=Indiana, MI=Michigan, MN=Minnesota, NY=New York, OH=Ohio, ON=Ontario, PA=Pennsylvania, WI=Wisconsin.

COOPERATION AND WHY IT OCCURS: THE CONCEPT OF EPISTEMIC COMMUNITIES

When natural resources transcend political boundaries, the people that share the resources must cooperate if the resources are to be managed properly. These shared resources, also known as "common pool resources," are often in jeopardy because of nonexistent or weak checks against unsustainable exploitation (Dietz et al. 2002). Cooperation has connotations of synergy and reciprocity—synergy in the sense that people work together to gain more than if they worked alone, and reciprocity because all participants expect benefits from cooperation. For cooperation to work, members of a group should know and respect each other's interests, should recognize shared goals, and should be willing to coordinate activities to reach those goals (Sebenius 1992;Yaffee 1998). Cooperation is working toward a goal "in such a way that each individual's successes facilitate the other's" (Kohn 1992, 4).

Because common pool resources are resources that many can access, conflict is all but inevitable. The important issue is whether conflict leads to competition or cooperation and conflict itself does not preclude cooperative behavior (Axelrod 1984; Hardin 1968; Kohn 1992; Olson 1965; Ostrom 1990). While actors might act selfishly, cooperation can occur if actors have mutual goals, communicate regularly, behave predictably, care about future interactions, and maintain ongoing relationships (Axelrod 1984). Frequent interactions among members of the community are instrumental to cooperation.

Other explanations for cooperation are rooted in the idea that being a member of a select community—known as an "epistemic community"— motivates collective action because members either feel obligated to play their role (coerced into participating through peer pressure) or are rewarded for doing so, or both (Haas 1992a; Haas 1992b; Montpetit 2003; Olson 1965). Members of an epistemic community have a shared sense of identity, shared goals, and shared vision; an epistemic community, thus, is a "network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area" (Haas 1992b, p. 3). Importantly, these community members share an understanding of an issue or how to achieve policy outcomes. At times, this common understanding is shaped less by the individual's affiliation with a particular agency or institution and more by his understanding of the issue. Epistemic communities, by producing a credible base of knowledge, reduce uncertainty and help make decisions clearer (Haas 1992b; Montpetit 2003). As is the case with the Joint Strategic Plan, epistemic communities also help make nonbinding agreements successful because membership in the community is often the tie that binds.

MULTIJURISDICTIONAL AGREEMENTS TO FACILITATE COOPERATION

The eight Great Lakes states, Ontario, and the U.S. tribes exercise considerable sovereignty over their waters and have relatively autonomous authority to manage their portion of the Great Lakes fishery. A "sovereign" government has defined territory, defined population, autonomy, governmental powers, a legal identity, and fiscal independence (Holloway 1972). Sovereignty has two basic elements: the government's ability to control its own domestic activities and its ability to interact with other sovereigns on an equally autonomous footing (Haas and Sundgren 1990). More simply, sovereignty allows governments to pursue their own interests (Weiss 1999). Many natural resources extend beyond borders, and since one jurisdiction's actions could affect another's, managing common pool resources requires cooperation among independent entities. The mechanism for cooperation typically comes in the form of a multilateral agreement among sovereign jurisdictions, often bolstered by an institution (e.g., a commission) that facilitates or compels cooperation.

The Joint Strategic Plan is one such multilateral agreement and should be placed in the context of other types of agreements to better understand how the plan is applied to the Great Lakes. Agreements come in many

forms, each designed to suit the parties' particular needs. Some agreements are more formal and binding than others and comparing the level at which an agreement binds is similar to weighing the issues introduced in Chapter 1 concerning "hard" and "soft" law.

The most common way for U.S. states to enter into a binding (or "hard") agreement is through the use of an interstate compact, which the U.S. Constitution authorizes. Canada has no commensurate institution. Compacts are legally-binding contractual arrangements among states, and because each member state's legislature must approve the compact, the compact is considered a statute in each signatory state and is binding with the force of law (Frankfurter and Landis 1925; Zimmerman and Wendell 1976). Interstate compacts are attractive because they are clear in what they do and they create a formal process; such agreements are not entered into lightly. Other arrangements like "federal-nonfederal agreements" (for example, the Canada-Ontario agreement, which addresses issues of shared authority between the Canadian federal government and the province of Ontario) and "federal-state commissions" (an arrangement with legal status between the federal government and states), serve to bind the participants (Donahue 1987).

Nonbinding (or "soft") arrangements among sovereign governments are common and have varying levels of formality (Elazar 1969; Weiss 1999; Zimmerman 2002). Routinely, governments discuss shared matters with each other and seek, in less formal ways, to harmonize regulations, share information, and establish reciprocal practices. Many types of arrangements exist to facilitate such nonbinding interactions; they could be exclusive to nonfederal jurisdictions, could involve federal and nonfederal jurisdictions, or even could involve states and foreign governments (Donahue 1987). The "interstate council or commission," for example, while established formally through an agreement or through legislation, typically vests the council or commission with "soft" management authority related to coordinating policies and persuading compliance (Donahue 1987). Other "soft," nonbinding arrangements include such things as informal interstate agreements, conferences among government officials, reciprocal legislation, uniform laws, verbal agreements, interstate commissions, and regional councils (Donahue 1987; Zimmerman 2002). The North Atlantic Salmon Conservation Organization, for instance, is an example of an institution operating under a "soft" agreement, where the participants use a multilateral forum to reach consensus on recommendations for conserving and restoring shared salmon resources in the north Atlantic region.

Binding and nonbinding agreements each have inherent advantages, disadvantages, and compliance issues, and their character depends on the unique circumstances on hand and what participants hope to accomplish. At one level, binding agreements may present a higher stature and could reduce transaction costs, as ongoing bargaining is often unnecessary after parties reach an agreement (Abbott and Snidal 2000). Compliance is often high in hard agreements, as participants only sign binding agreements with which they know they can comply (Birnie and Boyle 2002; Victor 1998); parties are less likely to sign the agreement if they could not comply with it, as they would not want their sovereignty limited against their will. Binding agreements can be enforced, though enforcement depends on the difficult task of asking the parties to punish offenders (Chayes and Handler-Chayes 1995). As a consequence, binding agreements tend to focus on the "lowest common denominator," the least ambitious agreement that will attract the maximum number of participants (Axelrod and Vig 1999; Crossen 2004; Soroos 1999). Indeed, "high compliance comes at a cost," says Victor (1997, 243). "Conservative commitments do not much push the real capabilities and willingness of societies to change their behavior. . . ."

Nonbinding, soft agreements are often more flexible in dealing with compliance, generally rely on consensus, and are more ambitious because the signatories are more likely to push the envelope if they know they will not be held legally to the agreement (Victor 1997). Compliance is heightened when all participants think the process is fair (Franck 1995; Ostrom 1990), when a party's reputation is at stake (Guzman 2002), when external pressures become too great, or when the agreement serves domestic interests (Faure and Lefevere 1999). Informal agreements can be more flexible and dialogue-focused than formal agreements because informal agreements can prompt members to go beyond what is on paper, can lead to more enlightened discussions, and can be flexible enough to adapt to changing needs or participants (Donahue 1987; Victor 1997).

A major characteristic of binding agreements is that they rely on parties to relinquish some of their sovereignty, something independent entities are loath to do. Nonbinding agreements, on the other hand, are at

times desirable precisely because they do not require the parties to give up their sovereignty. Sovereignty is jealously guarded and nonbinding arrangements honor such sentiments by focusing on collective opportunities rather than on constraining sovereign activities. In the Great Lakes region, the sovereign entities have the ability to interact with each other as they see fit and to establish institutions to facilitate their cooperation. However, all types of agreement, whether binding or otherwise, require the parties to comply with and implement the terms. If compliance was not expected, an agreement would not be necessary. Thus, agreements are usually designed to compel behavior and ensure that participants implement it.

Given their sovereignty over fisheries, how free are the provinces, states, and U.S. tribes to work with each other and with foreign governments? At first glance, strong federal powers to enter into treaties or to manage interstate/interprovincial matters would appear to preclude nonfederal involvement in foreign or cross-border activities. However, foreign and interstate/interprovincial matters are not necessarily exclusive to the federal governments. For instance, while the British North America Act (BNA, Canada's Constitution) suggests that the federal government, by virtue of its treaty power, takes the lead in foreign affairs, the BNA does not expressly prohibit provincial involvement in foreign agreements. The provinces are often called upon to implement treaties to which the federal government agrees (Kennett 1997; Rutan 1971). In the U.S., while the Constitution prohibits states from entering into interstate compacts, treaties, or alliances with foreign nations without the consent of Congress, state governments in fact are involved routinely in interstate and foreign issues. The absence of Congressional consent, a treaty, or a domestic statute does not seem, in practice, to prevent states from entering into agreements with each other or with foreign entities so long as the agreement relates to a state matter and does not encroach upon the federal government's rights and responsibilities (Goldsmith 1997; Zimmerman and Wendell 1976; Zimmerman 2002).

In the Great Lakes region, the nonfederal governments exercise sovereign control over their fisheries, including migratory fishes. Because the state and provincial boundaries extend to the international border, and because tribal fishing areas are defined by treaties, jurisdictional authorities are usually clear and absent of federal dominance. Each jurisdiction formulates and executes its own policies in its own waters, pursuant to its own legal obligations or desires. Nonfederal governments are free to enter into agreements with each other so long as the agreements do not intrude on federal authorities, do not disrupt the political balance among nonfederal governments or nations, or are not superseded by legitimate federal action such as a treaty. Just how bound the nonfederal governments wish to be by their agreements, however, depends on what the participants hope to achieve through the agreement.

WHY A NONBINDING PLAN FOR THE GREAT LAKES FISHERY? INTERVIEWS AND OBSERVATIONS NONBINDING

As has been established, the Great Lakes fishery management regime relies on a nonbinding agreement, the Joint Strategic Plan, to guide cross-jurisdictional cooperation. This is clearly a "soft law" approach, as participants are not bound in any legal sense to what they agree. As Chapter 1 notes, the International Joint Commission's reliance on soft law for many of its activities has often left it lacking in effectiveness, with policies described as "hortatory." This raises important questions about the efficacy of soft law, but those questions must be asked in the context of what an agreement was purported to achieve and the historical context in which the agreement was reached. In Great Lakes fisheries, a soft law approach was selected because participants guard their sovereignty and independence strongly; because flexibility is important, helping managers focus on issues that go beyond the lowest common policy to which members can agree; and because mechanisms exist that can heighten compliance with the nonbinding agreement. Based on an understanding of the history of Great Lakes fishery governance, and based on 62 semi-structured interviews with, and observation of current and past Joint Strategic Plan participants in action, lake managers believed this soft approach has served their needs and has helped them manage the fisheries effectively.

Sovereignty and Independence Are Important Considerations

Provinces, states, and U.S. tribes are relatively free to establish the type of fishery agreement that best suits their needs. A nonbinding agreement like the Joint Strategic Plan is particularly appropriate when the participants want to preserve their independence. The plan is not a specific management plan containing, say, binding regulations; rather, it is a process for cooperation. Signatories never intended the plan to be a substitute for, or an abdication of, individual state or provincial management authorities.

Jurisdictional independence is indeed a reality in Great Lakes fishery management; such independence accounts for the nature of the Joint Strategic Plan. Plan participants appeared to respect and understand the reasons why the Joint Strategic Plan is nonbinding. The interview participants, when asked about binding and nonbinding agreements, dismissed a binding agreement as simply unfeasible given the basin's history and that agencies would never agree to something that would usurp their sovereignty. A state manager captured this common sentiment: "There is no overarching authority here that has a legal framework to trump the individual authorities of the agencies." Observed a manager from Ontario, "Management authority . . . is currently vested in various agencies," and a colleague from a large state added concisely, "What, really, can another jurisdiction say to you about what you can and cannot do?" The Joint Strategic Plan members remain independent and the plan's success depends on how willing the province, the states, and the tribes are to adhere to the agreement. This shows that members understand each jurisdiction's independent ability to manage its own affairs. Not a single participant supported the idea of a binding agreement, citing that such an agreement, as one put it, "would never happen." The history of more than 25 rejected proposals between the 1880s and the 1940s would support this statement.

Great Lakes Fishery Management Needs Flexibility

Nonbinding agreements are more desirable than binding agreements when participants seek to be flexible rather than be committed to a specific course of action. Great Lakes fishery management requires flexibility because fishery policies must evolve as fish populations ebb and flow, as political pressures come and go, and as natural conditions change. Regulations react to the needs of the fishery, stocking and harvest levels are tied to changes in the forage base, and managers are often moved by internal politics. Fishery management practices, in other words, change as better knowledge becomes available and as managers react to ecosystem and political changes.

One question that has emerged through the discussions about Great Lakes governance is whether institutions, once established, become irrelevant or unable to adapt to changing conditions as new issues and governance needs emerge. Certainly, specific problems (often related to specific media, such as air or water), crises, or disciplines often prompt specific responses from government. The problem is, ecosystem management, and the need to integrate policy areas (e.g., to connect fisheries with environmental management) are not automatic, particularly when institutions focus on specific needs, when agreements address particular sectors, or when policy professionals interact only with like-minded colleagues.

The Joint Strategic Plan is an attempt to overcome the marginalization and stubborn unwillingness to change that characterize so many institutions. Early concepts of the Joint Strategic Plan were somewhat operational and more specific to fisheries than the agreement that ultimately emerged. Indeed, in the late 1970s, when the plan was conceived, some wanted a plan that would establish specific fishery objectives, outline operational plans to reach those objectives, and even declare fishery regulations for the states and provinces (Gaden 2007). However, such an approach was rejected largely because agencies were quite skeptical of any approach that was prescriptive, as such an approach would have been unnecessarily constraining and less reflective of the protean nature of fisheries. The goal was to avoid a point-in-time plan and instead create a process that would facilitate management deliberation and be capable of changing with the needs of the fishery (GLFC 1978). While such a strategic plan did not in itself preclude calcification or rejection of change, it did establish a flexible regime capable of addressing new, emergent issues should the members wish to address them. A binding, operational plan would not.

Fishery managers, interviewed for this chapter, acknowledged the importance of a flexible plan and connected such flexibility with the nonbinding nature of the Joint Strategic Plan. Several interview partici-

pants expressed their belief that a nonbinding fisheries agreement is superior for the Great Lakes because it allows the members to address any issue they find important. Lake committee and technical committee members said that because the plan does not attempt to lock jurisdictions into a specific course of action, they were able to use their best judgment and to be innovative in their approach to shared policies. Said an Ontario manager, "once [a firm, binding agreement] is signed, sealed, and delivered, there is no wiggle room. …Battles [would] be even more intense than they are now." A nonbinding agreement like this one allows the members to be flexible, raising the comfort level of those who might otherwise eschew binding innovation without wiggle room.

Moreover, a few participants observed that a binding agreement would be simply unnecessary for the purpose the lake committee process tries to achieve. The agencies do not need to be bound in a legal sense to what they develop through the lake committee process because the issues themselves are not wholly conducive to a binding agreement. For example, with the important exception of the Lake Erie Committee, the lake committees do not use the process to establish common harvest quotas.[3] They might use the process to come to a shared understanding of the lake's biology and the management practices needed to sustain the resource, but they do not use the process to determine a quota to which adherence is mandatory. Instead, the lake committees were set up to help members develop rehabilitation plans, keep members informed about jurisdictional activities, articulate shared goals, and balance interests. Success depends on integration of scientific understanding, proactive planning, creative thinking, flexibility, and a constant application of new information to changing conditions rather than on having an enforcement mechanism ensure that members adhere to the agreement. In other words, the plan was designed to focus more on shared needs and goals and less on how to hold the jurisdictions to specific, delineated provisions.

Finally, several participants pointed out that a binding agreement would be undesirable for Great Lakes fishery management because such an agreement would be weak and based on the lowest common denominator to which the agencies could agree. Said a senior state manager who was intimately involved in other multijurisdictional agreements, binding agreements "can force people to comply [with] the minimum standards, whereas they might voluntarily choose to do something better than that. [With a binding agreement], they know that they can't be forced to do something better and they can always explain doing the minimum to their constituents." A Canadian participant, reflecting on other binding agreements, noted that such agreements are "wishy-washy," and an academician who was also versed in agreements noted that "as soon as binding elements get set, they are either too general or they are too rigid [and, thus are] …less workable." As one Ontario manager noted simply, "sometimes, the more teeth you give something, the less effective it becomes."

Explicit in the Joint Strategic Plan, and implicit in the plan's flexibility, is the idea that members will practice "ecosystem management." The concept of ecosystem management is somewhat inconsistently understood throughout the Great Lakes basin, and fishery management has not been immune from disciplinary parochialism. This parochialism stands to reason: the Joint Strategic Plan process was created by, and for, fishery managers, and fishery managers do, indeed, dominate the Joint Strategic Plan process. The injection of ecosystem concepts into the process arises from individual members who are inclined to think beyond fisheries, from an explicit goal in the plan to produce environmental objectives, and from the need to engage colleagues from other disciplines. Such an approach depends on a flexible plan because members will be required to go beyond traditional fishery management and instead incorporate concepts from other management activities, like the Remedial Action Plan (RAP) process discussed in this volume by Mark Sproule-Jones (2008).

While the Joint Strategic Plan allows and envisions ecosystem management, members were not convinced the plan has been effective in facilitating the incorporation of concepts not traditionally considered "fishery management." For instance, members, when asked what should be changed about the Joint Strategic Plan, noted that the fishery managers still have a long way to go before environmental objectives are meshed with fishery objectives (Gaden 2007). Part of the problem is that assembling all experts—fishery and otherwise—is unwieldy. Achieving consensus among the fishery managers, let alone among a larger community, is extremely difficult. Another problem is simply the complexity of ecosystem management. Fishery managers might feel comfortable

making decisions about fishery practices, but they are liable to feel overwhelmed if they are asked to make decisions or linkages outside of their disciplines.

This reluctance to think outside of one's training is not unique to fisheries. Those in the field of environmental management routinely defer to, or ignore, fishery managers when they engage in their activities. Fishery managers, for instance, are not always fully engaged in the RAP and Lakewide Management Plan processes, and environmental managers are not engaged in the development of fish community objectives. Nevertheless, fishery managers believed that the flexible Joint Strategic Plan did remind them to collaborate with each other and with those in other disciplines.

Compliance Enforced by an Epistemic Community, Overseen by Neutral Third Party

As a nonbinding agreement, the Joint Strategic Plan is only as effective as the agencies' willingness to implement it; nothing in the agreement compels agencies in a legal way to adhere to the plan. Most participants stressed explicitly that each jurisdiction has its own mix of politics and regulations that make each jurisdiction's fishery management different. "We always tried to make sure that our colleagues understood that if we had to go back and change the regulations that there was this [internal] process that we had to go through. [The state] process had a life of its own," said a state manager, an observation several participants echoed. "You can't get around it," added another. In other words, participants knew that no matter what the Joint Strategic Plan says, or no matter what they came up with through the process, the agreement can only be so binding. Because of this reality, the lake committee members knew that they must work together to develop shared policies and they must promote those policies internally when they return to their home jurisdiction. Said a member of the Lake Superior Committee, "I think anything that a state management agency wants to do, they can do in spite of the Joint Strategic Plan . . . . It ultimately comes down to what our political masters are going to dictate."

These sentiments about implementation internally, within a jurisdiction, are important for two reasons. First, they indicate that the participants recognize and appreciate their jurisdiction's sovereignty. That is, no matter what the lake committee process develops, an individual agency has the final discretionary authority. Second, successful policies depend on the home jurisdiction's will and capacity to implement the policies. Thus, compliance with, and effectiveness of, the agreement is a function of how willing the jurisdictions are to implement decisions generated through the agreement.

Despite implementation challenges, participants believe that the nonbinding Joint Strategic Plan could address compliance. They expressed their belief that while the plan does not compel unwilling action (as might a binding agreement), it contains ample strategies to facilitate cooperation, thus allowing the participants to achieve their goals without a more heavy-handed agreement that might constrain flexibility or creativity. Interviewees were asked whether they believed the Joint Strategic Plan had ever forced or compelled them to act in a certain way. The responses were nuanced and reflected differences in how participants defined "compel." One of the most common responses was similar to the response from a state manager: "I can't think of examples where [the plan] forced us to do something we didn't want to do." Participants' feelings about whether the Joint Strategic Plan has ever compelled them to do anything generally corroborated their belief that agencies are sovereign and have the final say on implementation.

While members did not believe they are forced to do something against their will, most felt strongly that the plan has compelled them to do things that they might not otherwise have done. When asked for instances where the plan has changed their behavior, participants were often unable to identify specific examples. They stated instead that they simply knew that the Joint Strategic Plan process affected their thinking beyond the perspective of their own agency, stating that the plan offered them a different viewpoint and a motivation to find common ground. Given the ongoing interactions among the managers, exposure to different viewpoints is not only understandable, it was as the plan intended. In a few cases, participants could recall instances where one jurisdiction wanted to stock a certain species of fish, but when the issue was discussed through the lake committee and technical committee processes, such stocking became less attractive to the jurisdiction. A broadening of thinking occurs because a small group of managers in a particular jurisdiction interact with a much larger group of peers, which leads to fresh thinking outside of the particular agency's culture, resulting in refined ideas

and improved positions. In this regard, the plan has compelled, in soft, persuasive ways, a change in mindset and behavior. For example, members noted that the plan prompted them to "take other jurisdictions into account before they took actions that could affect the whole system," "forced a lot of people to re-think what they were doing," and prompted members "to think about things and to make some changes."

For lake committee activities to be successful, members must stay committed to what they develop jointly; members rely on forces besides a binding agreement to "compel" them to adhere to what they decide. These implementation forces include following a regular process (i.e., lake committee meetings), a feeling of ownership in the plan, and decision by consensus. As one technical committee member observed tellingly, we feel compelled to stick to the plan "because we have been involved so much in drafting [the policies]." Members had a sense of ownership in the plan, which could lessen the need for a binding agreement. The discussions that take place under the plan, in the words of one technical committee member, are "us versus us." A now-retired senior state manager added that he preferred the plan to other agreements "because it originates from the parties; it is not imposed." The managers understood that no higher force than themselves compels cooperation, rather, cooperation occurs because the members are vested in the plan's products.

The sense of ownership is deeply related to this nonbinding agreement's most fundamental strategy: decision by consensus. Consensus occurs after members express all viewpoints and when no participant objects to the opinion (GLFC 1997). Consensus is more than a definition of a decision-making process. It is a mindset that develops over time as members become more involved in the process. It is a way of doing business that emerged out of the jurisdictions' history of information sharing, coming together as equals, participating voluntarily, and preserving jurisdictional autonomy.

Joint Strategic Plan members were aware of why consensus is important and how it relates to the plan's implementation. Members emphasized many elements of consensus that make them feel somewhat bound to the decision that arises from it. For instance, they felt professionally accountable to their peers (to the epistemic community to which they feel they belong) and believed that breaking consensus, or being too obstructionist if the group is near consensus, was unprofessional. Members believed consensus reflects the members' work and sentiments, and because they feel they own the plan, members generally have a lessened incentive to break consensus willingly, as they would be contravening their own opinions and flouting the epistemic community's conventions.

Another reason participants believe the plan heightens the chances for compliance is that they believe the GLFC serves as an alternative—albeit a soft, neutral substitute—to an overarching authority with responsibility to bind the entities. The Commission, they stressed, is neutral enough to facilitate the process and gently pressure the agencies into implementing their agreements. In general, participants expected the Commission to push them along, but not so forcefully that the Commission upsets the basin's spheres of authority. This means that the Commission is expected to facilitate the process and to help the agencies learn about and address issues of concern. As one participant suggested, the role of the Commission is "to facilitate professional, appropriate standards of behavior of individuals participating in the process." What that means, according to a senior state official, is that the Commission is asked to "create the appropriate level of support where it's easier for [the lake committee members] to do the right thing than it is the wrong thing." To create that atmosphere, Joint Strategic Plan participants expect the Commission to make sure the meetings take place, to stimulate the discussions with the best science, to retain an institutional memory (e.g., prepare minutes), to serve as an honest broker, and to stay neutral. Said one lake committee member, the Commission's job is to "provide the prodding to the follow up; [to] gently nudge people along."

The dilemma that the Commission faces is trying to be involved enough in the process to encourage the development and implementation of proactive, shared policies yet detached enough so that the Commission itself is not the only entity compelling the participants to rethink their policies. The Commission is not a member of the lake committees or the Council of Lake Committees, but does participate actively in the technical committee process. The fact that the Commission is the only basin-wide fishery entity on the lakes makes it naturally prone to the risk of overstepping its bounds or, conversely, to having jurisdictions expect too much from the Commission if their home authorities are reluctant to act. Over the long term, if the Commission were to be perceived as continually over-

stepping its role as facilitator, the lake committee process would likely break down. Members would grow reluctant to participate in Commission-facilitated meetings and, instead, would either not work cooperatively or would establish processes outside of the Joint Strategic Plan to cooperate.

APPLICABILITY TO OTHER AREAS OF GOVERNANCE

As a governance institution, a Joint Strategic Plan-like structure is most applicable to situations where jurisdictions wish to preserve their autonomy, where they do not need to overcome competitiveness, and where they find it more important to have ambitious, flexible policies than to bind each other to less-ambitious agreements. This type of institution is also particularly applicable when the federal governments are not able to exert preemptive authority and when a neutral institution like the GLFC exists and is willing to facilitate a process without forcing action.

The success of a plan like this is also contingent on participants' desire to build and maintain relationships. Relationship-building takes time. The Joint Strategic Plan benefited from the fact that lake committees existed for 15 years before the plan was produced. This preexistence of a solid, respected, science-based epistemic community helped the plan from the start, as the community members developed the plan and its members did not have to first establish the relationships needed for them to work together effectively. Although the relationships were less formal before the plan, participants nevertheless for many years had a place to meet and opportunities to get to know one another and become accustomed to interacting. Thus, the existence of an epistemic community could be a major factor if successful replication of the Joint Strategic Plan in other areas of multijurisdictional governance were to occur.

The Joint Strategic Plan likely would be less replicable in situations where the participants interact on an unequal footing. In a situation where unequals interact—such as in systems dominated by federal governments—elements like synergy, trust, relationships, and consensus become skewed. The terms of such a relationship are quite different than the terms outlined in the Joint Strategic Plan. If the goal is to build a cooperative regime with unequals, the terms must be drafted in a way that either clearly delineates the roles of each of the participants or empowers the weaker partners and establishes boundaries for the stronger partners.

The Joint Strategic Plan lacks enforcement factors that other writers (e.g., Ostrom, 1990) have said are critical to common pool resource management. Instead, the foundation of consensus, science, plans and objectives, and relationships through an epistemic community are enough to help the participants work together in good faith and assure them that what they agree to will be implemented. The fact that politicians and others in the home agency generally do not interfere with the committee's work also helps the process, as the committee members are motivated by the fact that their decisions will be honored; that an external force will not supersede their decisions. The Joint Strategic Plan is capable of facilitating cooperation over the allocation of fisheries, as it does in Lake Erie, but since the plan is somewhat limited in that regard, it is difficult to speculate the extent to which a nonbinding process like the Joint Strategic Plan would be replicable in situations where harvest allocation (e.g., establishing harvest quotas) is particularly tense, especially if the community of participants lack a history of coexistence and cooperation.

CONCLUSION

Natural resources routinely transcend political boundaries; however, there are numerous tools available to facilitate collective action in the form of treaties, interstate compacts, informal interstate agreements, conferences, and shared understandings. Each type of agreement has its own benefits, drawbacks, and ability to bind the participants. Members decide on the type of agreement and its binding nature based on their circumstances and needs. Nonbinding agreements can be more flexible and ambitious than binding agreements, but compliance and implementation will often be a struggle. Participants who desire to protect their independence and sovereignty will turn toward a nonbinding agreement more readily than a binding agreement. In the Great Lakes region, a nonbinding agreement is suitable because fishery management requires flexibility, because participants desire a strategic and progressive approach that identifies shared goals, and because institutions and norms exist to nurture compliance without a heavy-handed entity or agreement to bind their activities. Participants also recognize that jurisdictional independence essentially precludes a binding approach.

The Great Lakes are unique in that the nonfederal governments, together, manage an international resource. Paraphrasing Frankfurter and Landis (1925), the jurisdictions have recognized that they are smaller than nations and greater than any one jurisdiction and in response, have established a formal process—tailored to suit their needs—to together manage fisheries. While these nonfederal entities guard their own independence and sovereignty jealously, they are also quite aware that independence and sovereignty means that one jurisdiction's actions affect everybody. They chose a consensus-based, nonbinding agreement because they felt it would maximize cooperation while still respecting jurisdictional sovereignty. The managers who currently participate in the process have not deviated from those sentiments.

The interviews demonstrated that, on the one hand, Joint Strategic Plan members believed they must work together to develop and achieve their shared goals, while on the other hand, they were aware that much of the success of their deliberations depends on the individual will of their home jurisdiction to implement their decisions. In the Joint Strategic Plan's case, members dismissed outright the idea that the plan binds their jurisdiction, but participants did point to the fact that it changes behavior and contains elements that heighten the chances that members will take the nonbinding agreement seriously. These elements include the on-going, consensus-based process itself and a sense of ownership in the plan that motivates the members to adhere to the plan, lessening the need for a binding agreement. A neutral third party, the GLFC, helps keep the process moving and instills confidence that some entity is keeping the process fair and the members true to their word. In essence, the members, through the Joint Strategic Plan, have acknowledged that some entity needs to be present to coordinate the process and that a soft force is all that is needed to make it work.

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NOTES

1. U.S. tribes, acting through two intertribal organizations (the Chippewa-Ottawa Resource Authority and the Great Lakes Indian Fish and Wildlife Commission) would become involved directly by the 1980s after court cases affirmed their management rights. Aboriginal fisheries in Canada are managed on behalf of the First Nations by the province of Ontario and the federal government. First Nations, thus, are not formal members of the lake committee process.

2. The lake committees under the plan are the same lake committees that were established by the GLFC in 1964. The plan essentially changed the committees from entities designed to serve the commission to committees designed to facilitate the Joint Strategic Plan, though the committees remained "commission committees."

3. Unlike the other lake committees, the Lake Erie Committee uses the Joint Strategic Plan process to establish an annual total allowable catch (TAC) for walleye and yellow perch, two of the lake's top commercial and sport species. Other lake committees do not use the process directly to address allocation issues, as shared allocation is less an issue in those lakes than it is on Lake Erie. While the plan is used mostly to help the jurisdictions throughout the basin identify and work toward their shared objectives, the application of the Joint Strategic Plan to the TAC process on Lake Erie does suggest that the plan's processes could be applied successfully to allocation-type decisions.

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Chapter 8: Environmental Cross-Border Regions and the Canada-U.S. Relationship: Building from the Bottom Up in the Second Century?

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A century ago, the United States and Canada embarked on joint environmental governance when they signed the Boundary Waters Treaty of 1909. Yet as both countries enter a second century of shared environmental challenges, there is little policymaking apparatus at the federal level to address ever more pressing threats. Instead, hope for environmental solutions, once directed at higher level federal and international authorities, is being directed downwards. One mechanism for carrying out such change is a "cross-border region" (CBR), or assemblage of local, regional, state, and provincial entities who, on the basis of shared ecosystems as well as other cultural, economic, historic, and location factors, are motivated to jointly pursue environmental change or preservation. This article reviews four CBRs operating along the U.S.-Canadian border and concludes that they are capable of having meaningful impact on environmental policies and outcomes. However, differences and asymmetries among CBRs render them less cohesive and directed than they might be. Environmental CBRs, as a model, offer the best prospect of becoming "hubs" for environmental cooperation between the United States and Canada but need help from federal authorities in the form of concrete support and resources.

The United States and Canada are now moving into their second century of bilateral governance of shared environmental challenges. And unfortunately, while those challenges are growing, the tools for addressing them are not. In recent years, close observers of Canada-U.S. relations have seen relatively little that is new at the federal level in the way of joint environmental initiatives.

The first century of joint governance was launched when the International Boundary Waters Treaty (IBWT) was enacted in 1909. Article IV of the Treaty included a statement that "waters shall not be polluted on one side of the border to an extent that causes harm to health or property on the other," and it was on the strength of this clause that a complex set of institutions, capped by the International Joint Commission (IJC), was established to manage shared waters all along the 49th Parallel. Over time, specific agreements with respect to Great Lakes waters and air pollution were also put in place, and the IJC was joined by other bilateral institutions such as the Canada-U.S. Air Quality Committee.

However, while these bilateral environmental institutions have in many cases served as stable mediators for narrowly defined environmental problems, broader sustainability objectives have become mired in politics and the sensitivities of diplomacy. Moreover, national governments in Canada and the United States backed off environmental policy-making beginning in the early 1990s due to resource constraints, a perceived lack of political pay-off, or both. In the post-9/11 era, environmental issues fell even further behind other policy priorities.

As a result, by the mid-1990s, many environmental observers were

looking not to national actors to lead the charge to avert further environmental degradation, but rather to an entirely different set of political actors at the continental level. It was hoped that the establishment of the trilateral North American Commission for Environmental Cooperation (CEC) would lead to the development of a continental environmental regime that would encourage, even push, national governments to act. However, these hopes remain largely unfulfilled; a lack of resources and political interference by participating governments placed real limits on the role that the CEC can play.

It is on this Canada-U.S. environmental policy-making stage, populated with many supporting but few lead actors, that subnational governments, particularly northern-tier and western states and to a lesser extent Canadian provinces, have quietly adopted central roles. Case study work over the past decade indicates that subnational governments, often acting through cross-border cooperative mechanisms, have been the primary locus of environmental policy initiatives and innovations to address transboundary problems (see for example: Rabe 2004 and VanNijnatten 2005).

The evidence shows that subnational (e.g., state and provincial) cross-border interactions have become more formalized, increasingly multilateral or regional in orientation, and more ambitious in terms of the projects undertaken (Alley 1998; Alper 1997; Alper 2003; Hildebrand, Pebbles and Fraser 2002; Springer 2002; VanNijnatten 2006c). Hope for environmental solutions that was once directed at the IJC and then the CEC is now being directed downward, to the subnational level.

KEY TO ABBREVIATIONS

CBR	Cross-border region
CEC	Commission for Environmental Cooperation of North America
GHG	Greenhouse gases
IBWT	International Boundary Waters Treaty
IJC	International Joint Commission
NEG/ ECP	Conference of New England Governors/Eastern Canadian Premiers
PNWER	Pacific Northwest Economic Region
PRI	Policy Research Initiative
PTP	Powering the Plains initiative
RGGI	Regional Greenhouse Gas Initiative
WCI	Western Climate Initiative

> Sustainability objectives have become mired in politics and the sensitivities of diplomacy.

The increased presence of subnational governments on the environmental policy-making scene suggests that it might be possible to reconstruct the Canada-U.S. environmental relationship from the "bottom up," recasting it according to a subnational model of cross-border regions (CBRs) rather than remaining solely focused on bilateral (i.e., nation-to-nation) entities.

This proposition raises several empirical questions. First, does this structure exist, i.e., does the U.S.-Canadian border comprise a series of environmental CBRs with distinct boundaries? Are U.S. states and Canadian provinces gathering more closely together in such a way that these jurisdictions can be considered regional clusters, linked together not only by geography but also by perception and networks? Second, if environmental CBRs exist, are they capable of autonomous action by means of articulating and acting on regional goals through joint institutions? Third, are they capable of having a meaningful impact on environmental policy goals, on the instruments chosen to achieve these goals (i.e., employing regulation, exhortation, or the market) and, perhaps most importantly, on outcomes? Finally and fundamentally, what are the prospects for achieving effective environmental policy from the bottom up as we move into the second century of Canada-U.S. environmental governance?

Combining insights gleaned from the author's own research on state-province environmental linkages,[1] as well as the *Leader Survey on the Emergence of Cross-Border Regions*[2] carried out by the Policy Research Initiative of the Government of Canada, this paper attempts to answer these important questions. First, distinct environ-

mental CBRs are indeed emerging on the Canada-U.S. border, although the boundaries of these regions are flexible and often issue specific. Second, these regions are capable of autonomous action, but significant asymmetries exist in terms of institutional maturity and functional capacity. Finally, environmental CBRs are having some impact in terms of policy goals and instrument choice but it is not yet clear whether the results are "meaningful" with respect to environmental outcomes.

ARE THERE DISTINCT ENVIRONMENTAL CROSS-BORDER REGIONS?

Ecological attributes provide the most obvious means of defining the boundaries of environmental CBRs. On the Canadian side of the border, an "Ecological Framework" has been adopted for official purposes and can assist in the task of demarking CBRs (Natural Resources Canada 2008). On the American side, however, there is more debate about where to draw ecological boundaries, and less standardization in terms of ecosystem boundaries.[3] And with no formal classification scheme consistently applied, the task of defining environmental CBRs with reference to ecological attributes is not straightforward.

Another approach might be to define environmental CBRs as those regions containing major ecological features, the threats to which provide some kind of impetus for joint action. In the Pacific Northwest, for example, the transboundary relationship is anchored by the Georgia Strait-Puget Sound Basin, spanning the southern coastal reaches of British Columbia and the northwestern areas of Washington state. Moving east, the Cascades and the "Crown of the Continent" (the *montane cordillera* landscape connecting Yellowstone to the Yukon) draws British Columbia, Alberta, and Montana into cooperative relationships.

Next there is the Red River Basin straddling Manitoba, North Dakota, and Minnesota, requiring attention to shared watershed management issues. In the Canada-U.S. heartland, the Great Lakes Basin already serves as the dynamis for considerable cross-border interaction, while Lake Champlain and its associated watershed further east encourage a mutuality of interest between Québec, New York, and Vermont. Finally, at the continent's northeastern edge, the Appalachian landscape and the shared coast and boundary waters, particularly the Gulf of Maine Basin, promote a shared approach to environmental challenges.

Delineating shared ecosystems in this manner has little relevance if they are not recognized as such, especially by residents living and working along the border. So the next step is to look for evidence of agreement on boundaries and ecological attributes of CBRs. Here, recent survey results may prove illustrative (Brunet-Jailly, Clarke and VanNijnatten 2006).

The Policy Research Initiative (PRI), in its Emergence of Cross-Border Regions Project, conducted initial research into interactions along the 49th Parallel. The approach was to examine "economic and organizational cooperative linkages" as well as "cultural/values similarity" (Policy Research Initiative 2005: 3). While the research was not designed specifically to accommodate ecological attributes, the PRI found that CBRs are a primarily subnational, regional phenomenon composed of different provinces and states straddling the U.S.-Canada border. Results pointed to the existence of four distinct CBRs: the West, the Prairies-Great Plains, the Great Lakes-Heartland, and the East, with some jurisdictions straddling more than one CBR (Policy Research Initiative 2006: 1).

In order to test their initial findings the PRI then conducted a detailed survey of environmentalists working in leadership roles in a cross-border capacity.[4] Only a small proportion of survey respondents actually worked in the environmental field, but subsequent to the survey, follow-up interviews were conducted by this author with individuals who had completed the survey and were also leaders in environmental transborder organizations. The results of the Leader Survey and interviews provide support for the notion of CBRs and indicate widespread agreement on their key aspects. First, respondents agreed that there *is* such a thing as a CBR, consisting of states and provinces as its basic units. Indeed, no respondent or interviewee specifi-

cally questioned the membership of three "core" CBRs consisting of British Columbia and Washington state in the West, Ontario and the Great Lakes states in the Great Lakes-Heartland, and the New England states, New Brunswick, and Nova Scotia in the East.

There were some differences of opinion about where to draw the boundaries on the outmost edges of some CBRs; for example, does Québec belong in the East or the Great Lakes-Heartland? Based on survey and interview responses, there appear to be transition zones on the periphery of CBRs where the inclusion of specific states or provinces is equivocal. And membership in a CBR not mentioned above, the Prairies-Great Plains CBR, seemed particularly difficult to define.

There was agreement that CBRs should be based at least in part on ecological features and that subnational units containing or adjacent to major ecological features should be included in the core CBR. When asked which factors were most important in defining their CBRs, survey respondents rated shared ecosystems quite highly, more so than cultural similarities or historical links (Table 1). That response was strongest in the Great Lakes, which may reflect the importance of lake ecology in everyday interactions.

Respondents expressed the most support for location factors as a defining feature of CBRs, and this implies some agreement on the importance of shared physical/natural boundaries. Only economic exchanges were more highly rated.

In verbatim comments, many survey respondents (including twice as many Americans as Canadians) as well as all interviewees wanted to see some reference to environmental linkages, natural landscape, or shared geography added to the definition of CBRs. One survey respondent noted, for example, that "the Washington state-British Columbia CBR is tied together by the shared central Columbia River and the Puget Sound/Georgia Basin watershed/airshed." An interviewee from the Great Lakes region stated that "the physical presence of the watershed is key" (Krantzberg interview), while another from the Northeast noted that "the real region is based on ecosystem boundaries" (Tremblay interview).

While all interviewees emphasized shared ecosystems with circumscribed boundaries in their understanding of CBRs, they also observed that a CBR should be defined, in the words of one interviewee, by its "environmental reach," which is less precise than defining the physical boundaries of shared ecosystems and may well extend beyond strict ecological boundaries. As a Great Lakes interviewee explained, "the watershed creates a shared necessity to cooperate" but there is some geographic license in defining the region, depending on the issue under discussion (Krantzberg interview). She noted, for example, that when discussing the problem of invasive species, Québec is considered part of the region, whereas discussions of air pollutant transport tend to shift the borders of the region more toward the Midwest.

A state official in the Northeast, someone who has been actively engaged in transboundary environmental cooperation, observed that "environmental factors define the boundaries of the Northeast region, but I am not only referring to 'shared ecosystems.' Rather, this is a cross-border region which shares an environmental strategy based on the reality of cooperation to deal with shared environmental issues. Shared ecosystems are only part of this reality" (Smith interview).

An interviewee from the Pacific Northwest explained that "bigger is often better" in terms of defining a CBR, as so many environmental issues require a broad coordination of efforts (Trachsel interview). These equivocations suggest that jurisdictions directly bordering a

TABLE 8.1: "What factors are important when defining the boundaries of your CBR..." (Policy Research Initiative Leader Survey, 2005-2006)

FACTOR	EAST	GREAT LAKES	PRAIRIES-GREAT PLAINS	WEST
Shared Ecosystems	55%	81%	75%	75%
Locational Factors	79%	95%	100%	89%
Economic Exchanges	76%	95%	100%	89%
Cultural Similarities	28%	14%	8%	17%
Historical Links	52%	43%	42%	26%

major ecological feature, e.g., a watershed, are at the core of the CBR, while those located on the periphery may be included or not depending on the issue. Speculatively, the challenges to defining a Plains/Prairie CBR may have something to do with the lack of a major ecological feature acting as a focal point.

Still another criterion for determining the boundaries of environmental CBRs is to trace the formal imprint of cross-border governance. This author constructed a database of state-province linkages along the Canada-U.S. border.[5] "Linkage" was defined as follows: mechanisms setting forth procedures and conditions for regularized interactions in a formalized manner by means of jointly signed documentation, incorporation of interactions into jurisdictional operating procedures and budget, or the establishment of identifiable institutions attached to resources and personnel.

In the basic calculation in Table 2, the number of environmental linkages was totaled for each province paired with all border or border-region states.[6]

Ontario has a high number of ties with all eight Great Lakes states, indicating a significant level of clustering in this region. British Columbia shares many linkages with its contiguous northwestern neighbours and also is linked with California and Oregon, indicating another cluster. Indeed, the top ten state-province pairs in terms of the number of environmental linkages are almost exclusively Great Lakes and Pacific Northwest jurisdictions.

The number of environmental linkages between New England jurisdictions and Atlantic provinces is generally lower; however, the Québec-New Brunswick-Nova Scotia-Maine-New Hampshire-Massachusetts grouping suggests another regional cluster. It is noteworthy that, in terms of formal collaborative linkages, there does not appear to be any significant level of clustering among Plains/Prairie jurisdictions.

Table 3 provides data organized by region in two different ways. There is overlap of some states and provinces when determining the boundaries of New England versus the Northeast. The purpose here is to construct an Index of Linkages, which measures the average number of linkages per pair in each region, and to examine this alongside an Index of Bilaterality, which is the ratio of bilateral to multilateral agreements seen within each region.[7] Viewed together, these data provide insight into the degree and nature of transborder institutionalization within environmental CBRs.

TABLE 8.2: Number of Linkages per Province-State Pair (Top 20 only)

PAIR	# OF LINKAGES	PAIR	# OF LINKAGES
BC-WA	22	AB-ID	11
ON-MI	17	QC-PA	11
ON-MN	16	ON-IN	11
QC-NY	15	ON-IL	11
ON-NY	13	AB-WA	11
ON-WI	13	BC-MT	11
ON-OH	13	BC-CA	11
BC-ID	13	AB-OR	11
ON-PA	13	QC-ME	10
BC-OR	13	QC-NH	10
QC-VT	12	NS-ME	10
NB-ME	12	NB-NH	10
AB-MT	11	NB-MA	10

Key

AB Alberta
BC British Columbia
CA California
ID Idaho
IL Illinois
IN Indiana
MA Massachusetts
ME Maine
MI Michigan
MN Minnesota
MT Montana
NH New Hampshire
NY New York
NB New Brunswick
NS Nova Scotia
OH Ohio
ON Ontario
OR Oregon
PA Pennsylvania
QC Québec
VT Vermont
WA Washington
WI Wisconsin

As Table 2 indicates, environmental linkages are regionally concentrated—that is, they cluster—in the Pacific Northwest, the Great Lakes, and New England. British Columbia-Washington state have the greatest number of linkages (22), followed by Ontario-Michigan (17), Ontario-Minnesota (16), and Québec-New York (15).

The New England region has a smaller number of agreements and institutions but those linkages, more than in any other region, tend to be multilateral rather than bilateral (i.e., involving more than one other member state or province in the region). The Conference of New England Governors/Eastern Canadian Premiers (NEG/ECP), its Committee on the Environment and its International Committee on Energy, as well as the Gulf of Maine Council on the Marine Environment, and various Northeast forest and fire protection councils, account for much of the cross-border activity.

The broader Northeast bloc shows a greater tendency toward bilateralism. This can be explained

in part by the numerous agreements between Québec and its neighbors. One might argue that there is a Québec-New York-Vermont (Northern New England) subregion, which straddles but is for some purposes distinct from the core New England region.

In the Great Lakes, there is a combination of multilateral and bilateral activity; there are nine mechanisms incorporating all Great Lakes jurisdictions as well as a host of bilateral agreements between Ontario and its neighbors. The extent of these latter agreements tips the balance of the region toward bilateralism. There is also a significant number of bilateral agreements between Manitoba and its neighbors; these jurisdictions might be considered another subregion.

The Prairies/Plains region scores relatively low both in the number of environmental linkages focused on the region and on the index of bilaterality. This does not indicate a high level of multilateralism among Prairie/Plains jurisdictions, however. In examining the database more closely, it would appear that pairs included in the Prairie/Plains region are often drawn into activities involving states in the broader Midwest (e.g., the Association of Midwest Fish and Game Law Enforcement Officers, the Midwest Association of Fish and Wildlife Agencies, the North Central Forest Pest Workshop), the mid-continent states such Colorado, Kansas, Missouri, Nebraska (e.g., the Central Flyway Council), or the broader West (e.g., the Western Association of Fish and Wildlife Agencies).

In the Pacific Northwest, the picture is predominantly one of bilateralism, with the very close British Columbia-Washington relationship at its core. The Northwest has the highest score on the index of bilaterality and the second highest number of linkages focused on the region. Certainly, there are multilateral mechanisms dealing with coastal environmental management, such as the Pacific States-British Columbia Oil Spill Task Force, and other groups focusing on natural resource management at the regional level, such as the Western Legislative Forestry Task Force and the Western Wildlife Health Cooperative. The Pacific Northwest Economic Region (PNWER) is an umbrella linkage set up by statute to deal with transboundary policy and planning in the region; among its many projects, PNWER deals with a number of environmental/sustainability issues, primarily those relating to energy technology and development. British Columbia and Alberta, in addition to being members of PNWER, are also connected to their southern neighbors by a wide variety of bilateral agreements and institutions.

TABLE 8.3: Subnational Environmental Linkages by Region

REGION	INDEX OF LINKAGES* (AVG # OF LINKAGES PER POSSIBLE PAIR)	INDEX OF BILATERALITY† (RATIO OF BILATERAL TO MULTILATERAL AGREEMENTS)
New England Provinces: NB, NS, PEI, NL States : NH,VT, ME, MA, CT, RI	**7.1**	**.49**
Northeast Provinces: QB, NB, NS, PEI, NL States : NH,VT, ME, MA, CT, RI, NY, PA	**7.0**	**.77**
Great Lakes Provinces: ON States : NY, PA, OH, MI, IN, IL, WI, MN	**13.25**	**1.05**
Prairies/Plains Provinces: MB, SK, AB States :WI, MN, ND, MT	**5.5**	**.54**
Pacific Northwest Provinces: BC, AB States :WA, OR, ID, CA, AL	**8.5**	**1.24**

* The Index of Linkages is calculated as total linkages divided by the product of the number of provinces in the region multiplied by the number of states in the region.

† The Index of Bilaterality is calculated as the number of bilateral agreements divided by the number of multilateral agreements.

When the three different approaches to setting the boundaries of environmental CBRs—ecological attributes, survey results, and institutional networks—are overlaid upon one another, it becomes clear that CBR definitions and boundaries tend to be firm enough to identify core membership in a region but flexible enough so as to incorporate other relationships depending on the issue. Three environmental CBRs stand out for being built upon distinct, core clusters of jurisdictions:

the Pacific Northwest (encompassing British Columbia, Alberta, Washington, Idaho, Oregon, and Montana); the Great Lakes-Heartland (including Ontario, Minnesota, Michigan, New York, Illinois, Indiana, Ohio, Wisconsin, Pennsylvania), and New England (including Québec and the four Atlantic provinces as well as Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont).

In addition, we can identify three smaller clusters of jurisdictions that straddle core cross-border regions and might be considered subregions characterized by networks of bilateral interactions: Québec-Northern New England (New York and Vermont); Manitoba-Minnesota-North Dakota; and, Alberta-Montana-Idaho.

The three core clusters can radiate influence outward to draw in other states and provinces in the subregions or those who lie on the periphery but want to be connected for particular purposes. For example, Québec, New York, and Vermont may be incorporated into broader Northeast environmental efforts or the tentacles of the Northwest may reach out to Alaska and California on selected issues such as coastal management and energy. The Plains/Prairie grouping is not nearly as cohesive as any of the other environmental CBRs and perhaps does not fit the definition of an environmental CBR at all. Rather it is a very loose grouping of jurisdictions that interact bilaterally or are occasionally drawn into the activities of other regions.

ARE ENVIRONMENTAL CROSS-BORDER REGIONS CAPABLE OF AUTONOMOUS ACTION?

A Northeast interviewee expressed the view that, "one of the most important aspects of cross-border cooperation is to have a defined plan with measurable goals/objectives and a timeline—specificity is necessary. This provides a roadmap for cross-border activity and also provides a measure of accountability" (Smith interview).

That person may as well have been describing a set of criteria for determining whether environmental CBRs are capable of autonomous action. Whether environmental CBRs have articulated regional goals—and whether these are "hard" or "soft" goals—are qualifying factors. The maturity and governing capacity of joint institutions also matter. Concepts like horizontal and vertical networks, and the concrete and in-kind supports that are available for achieving any regional goals to which jurisdictions have committed, will come into play and should be taken into consideration when evaluating a CBR's capacity for action.

Goals and Accountability

Each of the three core CBRs that have been identified in the last section, the Pacific Northwest, Great Lakes-Heartland, and New England CBRs, has undertaken region-wide initiatives. There are, however, notable differences among the three regions in terms of the applicability and specificity of their goals, as well as accountability measures.

New England CBR

Truly region-wide initiatives, which involve states and provinces on an equal basis, are strongest in the New England region. The Conference of New England Governors/Eastern Canadian Premiers (NEG/ECP), out of successive rounds of multilateral planning and negotiating, created Action Plans for Mercury, Acid Rain, and Climate Change—with provisions applying to all participating jurisdictions. NEG/ECP Action Plan goals feature overall pollution reduction targets (e.g., a 50 percent reduction in mercury pollution by 2003) connected to specific tasks that are intended to achieve these goals (e.g., emission limits for point sources and waste management protocols).

The same approach was taken in successive Gulf of Maine Council Action Plans. These plans are even more detailed, although less focused on targets than on tasks (e.g., "protect and restore marine habitats"). Objectives are tied to work plans that contain dozens of initiatives (e.g., mapping of priority areas, conducting risk analysis for invasive species). In both the Gulf of Maine and NEG/ECP initiatives, progress on action items must be reported to political leaders in the participating jurisdictions on a regular basis. However, goals are not legally

binding on participating jurisdictions unless they have been incorporated independently into domestic legislation, which occurs infrequently and almost exclusively on the U.S. side.

Great Lakes-Heartland CBR

Activities in the Great Lakes tend to be bifurcated. Many initiatives, such as the Aquatic Nuisance Species or Soil Erosion and Sediment Control programs conducted by the Great Lakes Commission, had their origins on the American side of the border as an outgrowth of state-federal cooperation. The role of Canadian jurisdictions is less significant in terms of program initiation. And while such programs contain specific goals, they exist in support of ongoing binational/federal activities rather than being truly initiatory in the sense of the NEG/ECP Action Plans, which fill actual policy gaps where federal authorities have not acted. In terms of accountability, such programs have reporting requirements, as they are funded by state or federal departments and are thus subject to oversight. This accountability does not necessarily promote regional objectives, however.

Truly region-wide initiatives, such as updates to the Great Lakes Water Quality Agreement, traditionally have been the preserve of the two federal governments. However, recently, through an initiative of the Annual Conference of Great Lakes Governors and Premiers, the 1985 Great Lakes Charter was updated (Great Lakes Annex). This agreement may signal movement toward a more broadly based, subnational approach in the future, at least in terms of water management in the basin.[8]

The Annex will put in place new processes for judging water removals on the basis of potential environmental harm and requires that states and provinces institute conservation programs. The Charter cannot be enforced internationally but relies on domestic legislation similar to the NEG/ECP Action Plans. Significantly, however, the Charter contains provisions for legal action in the event that a participating jurisdiction does not implement the agreement or fails to abide by its terms, and this will provide a significant degree of accountability if/when the Charter comes into force. At present, not all jurisdictions have ratified the compact.

Pacific Northwest CBR

There are a number of British Columbia-Washington state agreements covering the Georgia Strait-Puget Sound Basin. The goal is to lay out management actions to be undertaken by participating jurisdictions in order to reduce pollution (e.g., initiatives to reduce emissions from agriculture, industry, and marine vessels).

Specific goals and timelines are generally not a feature of such bilateral agreements and multilateral projects involving all or most jurisdictions in the region tend to be even more informal. Examples include the much-vaunted Hydrogen Highway project, which involves linking the infrastructure for fuel cell cars in individual jurisdictions, and the PNWER Consensus on Water Issues, intended to address the impact of climate change on water resources within the region.

However, the Pacific Northwest environmental CBR has been drawn into climate change programs being pushed by the western U.S. states, and this may signal a turn toward more specific and directed environmental policy efforts, at least in this policy sector. One of these, the Western Climate Initiative (WCI), was launched in February 2007 by the governors of Arizona, California, New Mexico, Oregon, and Washington to develop regional strategies for reducing greenhouse gas (GHG) emissions. Other western states and also western provinces of British Columbia and Manitoba have joined the Initiative.[9] Through WCI, the partners have set an aggregate GHG reduction goal of 15 percent below 2005 levels by 2020 (Western Climate Initiative 2007). A market-based mechanism in the form of an emissions trading scheme is being implemented to help achieve that reduction goal.

Maturity of Joint Institution

Another indicator of the capacity for autonomous action is the maturity of the joint institutions that have been created in order to carry out cross-border regional goals. Table 4 shows state-province linkages within regions according to the date of establishment[10] and pinpoints the percentage growth in linkages during various time increments as well as the growth overall.

These data are helpful under the premise that "older" environmental CBRs, by virtue of their institutional maturity, may have enhanced capacity for autonomous action through more established inter-relationships and more experience dealing with a range of issues. One might also surmise that older linkages, as well-established entities, have better access to funding sources. More recent linkage building may indicate less actual experience in terms of transborder problem solving, a less established architecture

Table 8.4: Environmental Linkages by Region and Time Period

ENVIRONMENTAL	>1980	1980 % of 2005	1981-85	1986-90	1991-95	1996-2000	2000-05	2005
New England	6	50%	1	3	0	0	2	12
Northeast	6	30%	1	6	1	1	5	20
Great Lakes	5	24%	3	4	4	4	1	21
Pacific Northwest	4	19%	1	2	10	2	2	23

of engaging in such problem solving and thus less capacity for follow through. The New England region experienced early institutionalization; almost half of all the region's linkages, including the multilateral NEG/ECP as well as entities focusing on resource management, air quality and energy issues, were in place prior to 1980. In the NEG/ECP, the New England region has thus had an umbrella organization focused on environmental and sustainability issues for three decades. This may explain the importance of "historical links" that respondents from the region referred to in survey questions. More recently, there has been considerable bilateral activity on the margins to deal with specific environmental and management issues.

In the Great Lakes region, there has been consistent linkage building until recently. A number of linkages include all Great Lakes jurisdictions and have been in place for some time, but seem to be linked informally, such as the Great Lakes Water Use Database. Lacking here is a subnational umbrella organization with a broad mandate, such as the NEG/ECP or PNWER. As noted by a Great Lakes interviewee: "There are too many institutions in the Great Lakes basin… the big question is: who is in charge?" (Krantzberg interview).

On the other side of the continent, the Pacific Northwest region is institutionally "younger." The region experienced a burst of new linkages (10 in all) from 1991 to 95. During that time, British Columbia and Washington state signed an Environmental Cooperation Agreement and established an Environmental Cooperation Council; also PNWER was created and became active in environmental issues. More recently, British Columbia and Alberta have established additional linkages with their contiguous state partners to address air and water pollution as well as energy cooperation.

Vertical and Horizontal Governance and Integration

Another measure of an environmental CBR's effectiveness is its capability for vertical and horizontal governance, which is key to regional coordination of environmental issues. Work by Anne-Marie Slaughter (2004) indicates that vertical and horizontal transborder networks of officials can build trust and establish the kind of long-term relationships that are necessary for addressing the increasing number of policy problems that reach across state borders.[11]

So another question to explore is whether environmental CBRs have the capability to integrate activities from higher to lower levels of governance across their respective regions. The case study literature indicates that environmental CBR linkages are focused primarily around state-province executive actors and are transgovernmental and transborder in nature, i.e., they involve communication and cooperation between officials in related departments of all participating governments. These interactions and cooperation are typically the byproducts of annual conferences of political leaders, whose outcomes then provide direction to committees of senior-level officials invested with process and management responsibilities and mid-level officials assigned project-specific tasks. Between meetings, further deliberation and communication continue electronically.

Further insights into this question are provided by interviewees, all of whom work full-time with trans-

boundary organizations. In their view, a major difference among environmental CBRs—and one that can perhaps serve as a proxy for their permanence and ability to form and maintain effective relationships—lies in the sophistication of their committee systems. The Great Lakes region has an elaborate system of organizations which operate committees and subcommittees, and these tend to be more permanent and better staffed than their counterparts elsewhere. New England organizations are relatively sophisticated in terms of their committee systems but do not tend to be permanent or well staffed, with the exception of the Gulf of Maine Council. In the Pacific Northwest, committee systems are less elaborate and one jurisdiction often agrees to take on management responsibilities. PNWER is a well-established exception.

In New England, federal-level involvement usually is achieved through formal provisions for "observer status" on committees addressing particular issues or carrying out specific projects. This is true for NEG/ECP committees as well as the Gulf of Maine Council. Often these same observers prove instrumental when project-specific federal funding is sought. New England groups also collaborate with local governments, as seen in projects associated with the NEG/ECP's Mercury and Climate Change Action Plans. The Gulf of Maine Council has a long history of collaborating with local and regional governments.

The federal presence is strongest in the Great Lakes given the presence of the IJC and its associated bodies. This is true both in terms of formal collaboration as well as scientific and technical support. In fact, some observers contend that the federal presence overshadows subnational initiatives and may in some cases be a barrier to cooperation in the region. But local governments are also becoming more active in Great Lakes initiatives and undertaking certain multilateral initiatives.

In the Pacific Northwest, collaboration with regional governments, such as the Greater Vancouver Regional District, is fairly routine. Here, too, the federal presence is stronger than in New England. Federal officials often provide funding and in certain cases have been willing to assume project leadership—something that is not seen in the New England region.

There is another question to be considered concerning governance structure and that is whether environmental CBRs have the capacity to integrate activities horizontally across sectors, i.e., to engage and link government, the private sector and citizens in environmental initiatives? This leadership responsibility is still evolving and remains a weaker aspect of environmental CBRs in general. It likely reflects the fact that, as noted above, the main drivers of cross-border regional action tend to be executive department officials.

> "The New England region experienced early institutionalization; almost half of all the region's linkages were in place prior to 1980.

Lack of horizontal integration may also reflect the relative lack of organizational capacity among civic groups within the various environmental CBRs. Yet even in the Great Lakes region, where civic groups are well organized and well connected with the scientific-expert community, the major linkages are dominated by interactions between executive officials.

In New England, the Gulf of Maine Council purports to facilitate horizontal networking. Its website notes that, "We organize conferences and workshops; raise public awareness about the Gulf; and connect people, organizations, and information" (Gulf of Maine Council website). And, in fact, representatives of civic groups sit on the central Council and also serve on its more than a dozen committees, although they are far outnumbered by government officials. The NEG/ECP, by contrast, is less consultative, interacting more frequently with policy experts than with civic representatives. In the Pacific Northwest, there is a tendency to seek interactions with the private sector over those with civic groups.

Financial Structure

Resources are a problem for all environmental CBRs. All regions share a key vulnerability in being reliant on existing departmental or executive branch funds for ongoing management activities and specific projects. It goes without saying that for the executive entities providing funding dollars, the priorities of fulfilling domestic mandates take precedence over transborder projects,

particularly in the United States, where there is active legislative oversight.

Being reliant on executive-level funding also renders environmental CBRs susceptible to changes in government in one or more jurisdictions, and a corresponding lessening of political support and resources for regional projects. Table 6 points to this problem; respondents to the PRI Leader Survey consider "underfunding of initiatives" and "the capacity of cross-border organizations" to be among the most significant obstacles to cross-border cooperation.

The majority of project-specific funding is sought from Canadian and American federal departments and even, in some cases, the CEC. The fact that such funding is ad hoc and temporary in nature proves an obstacle to medium- and long-term planning. There is also a real need for funding to support travel and in-person interactions, which all interviewees perceive to be critical for cooperation and project success. As one interviewee from New England noted, "[t]he most important thing that [federal] governments can do to promote the work of CBRs is to provide funding to facilitate the face-to-face interaction that is so critical to successive cross-border projects. Targeted federal funding to support travel costs … is key" (Smith interview).

To summarize with regard to the central question posed in this section, environmental CBRs do show evidence of the capacity for autonomous action. This is true both in terms of regional goal articulation and institutional development of their shared institutions. But there are significant differences and asymmetries among them.

Shared institutions in New England are institutionally mature and regionally integrated, exhibiting the capacity to work vertically and to a lesser extent horizontally through relatively stable committee systems. Also, a higher level of policy ambition is expressed in "hard" goals backed up by concrete timelines and reporting requirements. And while resources are an ongoing problem for all environmental CBRs, the more institutionally mature New England region has had some success in obtaining funding for specific progams.

Many of these same features can be seen in the Great Lakes region. It contains a complex array of organizations, many of which exhibit organizational sophistication and governance capability. Great Lakes linkage mechanisms are horizontally and vertically linked for networking, and have resources at their disposal, especially in terms of federal scientific and technological expertise.

TABLE 8.5: PRI Leader Survey Responses

BARRIERS TO COOPERATION "...TO A GREAT EXTENT"	NE	GL	P-GP	WEST
Different regulatory/ legal systems	45%	24%	67%	42%
Security	45%	38%	50%	56%
Infrastructure conditions	41%	57%	50%	39%
Border crossing conditions	45%	81%	56%	54%
Economic conditions	41%	52%	58%	50%
Political factors	52%	57%	67%	56%
Capacity of cross-border organization	55%	52%	67%	61%
Underfunding of Initiatives	55%	43%	58%	42%

Key
NE Northeast
GL Great Lakes Provinces
P-GP Prairie Great Plains

However, the Great Lakes environmental CBR tends to be limited in two major ways. First, the tendency toward bilateralism in the region and the lack of an umbrella organization hamper region-wide ambitions. It is possible that the recent activism of the Annual Conference of Great Lakes Governors and Premiers signals greater subnational regionalism, however. Second, the larger federal presence, both in terms of cross-border linkages and departmental objectives, occupies policy room that might otherwise be available to subnational governments. In particular, the U.S. federal government looms large over the Great Lakes environmental CBR, and this has had an inhibitory effect on its capability for autonomous action.

In the institutionally newer Pacific Northwest Region, initiatives are more management-oriented rather than focusing on specific goals, and the CBR is less institutionally mature. As the major multilateral organization, PNWER is an exception in terms of institutional capacity but still reflects the lack of project specificity. Vertical and horizontal networking are under development, but relationships tend to be strongest with the federal government and the private sector.

DO ENVIRONMENTAL CROSS-BORDER REGIONS HAVE MEANINGFUL POLICY IMPACT?

While environmental CBRs can be shown to exist and are characterized to a varying degree by their ability to articulate and act on regional goals through joint institutions, any estimate of their actual or potential impact on environmental policy is more speculative. There is a marked lack of empirical research in this area. Here it is only possible to set down some initial thoughts on the impact of environmental CBRs based on the policy goals adopted by individual jurisdictions, their policy instrument choices, and actual environmental outcomes. Policy goals refer to the stated or expected ends of the course of action to which a government has committed. The existence of shared policy goals within environmental CBRs denotes a commitment on the part of participating governments to come together and to cooperate across borders. Joint policy goals signal to the private sector and citizens that their governments acknowledge a problem, they agree that solving the problem requires some form of coordinated action, and they are willing to spend time together discussing the problem in a joint forum. This is not insignificant.

> The fact that project-specific funding is ad hoc and temporary in nature proves an obstacle to medium- and long-term planning.

Most observers would agree that considerably more forceful action by governments is necessary across the full range of environmental problems. To achieve that requires setting more ambitious, long-term goals, employing a wide range of policy instruments to achieve these goals and paying much closer attention to what is actually achieved in terms of environmental outcomes.

Certainly CBRs have developed commitments to joint environmental policy goals. In the case of climate change policy, for example, the NEG-ECP's *Climate Change Action Plan* commits members to reduce GHG emissions to 1990 levels by 2010, 10 percent below 1990 levels by 2020 and ultimately to decrease emissions to levels that do not pose a threat to the climate. Further west, the Dakotas, Iowa, Minnesota, Manitoba, and Wisconsin have launched a Powering the Plains (PTP) initiative with a consensus agreement to develop regional scenarios for reducing CO_2 emissions 80 percent from 1990 levels by 2050. PTP partners also have committed to developing a regional energy transition roadmap guiding efforts to achieve this long-term goal. In the Pacific Northwest, British Columbia, Washington, Oregon, and California have agreed to individually reduce GHG emissions by 33 percent from current levels by 2020.

Other environmental issues have brought additional commitments to shared goals. For example, reduction in mercury pollution is the focus of another NEG/ECP Action Plan. And, states and provinces in the Great Lakes region, working through the Great Lakes Commission and other collaborative organizations, have adopted common objectives with respect to aquatic nuisance species and coastal wetlands. The Pacific Northwest has spawned joint initiatives addressing transboundary air quality and ecosystem health in the Puget Sound-Georgia Basin area.

By themselves, the existence of shared goals within environmental CBRs may represent a form of progress for environmental policy, particularly in cases where individual jurisdictions have endorsed regional goals as a first step (i.e., they previously had no target), or where jurisdictions have endorsed successively more ambitious goals. For example, Newfoundland, home to some of the largest point sources of atmospheric mercury emissions in Canada, showed little inclination to reduce those emissions prior to participating in the NEG/ECP Mercury Action Plan. As another case in point, British Columbia's target for GHG reductions, now in line with its geographic neighbors, grew considerably more ambitious over time.

Without full case studies, it is difficult to argue that

progress in setting policy goals in these specific instances are due primarily to activities in environmental CBRs; it seems reasonable to propose, however, that these activities have had *some* influence. Pressure to act more urgently or forcefully has, in most cases, originated with U.S. states, not Canadian provinces. States also have been the driving force behind some of the most ambitious CBR initiatives.

For example, it was the commitment by Massachusetts to a "Zero Mercury Strategy" which helped to drive the NEG/ECP's Mercury Action Plan. The Western Climate Initiative (WCI) emerged out of the energies of a group of West Coast states and it was only when the Initiative was up and running that British Columbia and other Canadian provinces became interested. The original impetus for the Great Lakes Charter was concern on the U.S. side among states that there would be major demands on the basin's water resources in the future (International Joint Commission 2000: 4).

When states have met regularly with their Canadian counterparts in environmental forums, they have exerted a form of "peer pressure" on provinces to follow their lead. And the greater sense of urgency across the U.S. border seems to have produced initiatives that are in many cases more ambitious and more stringent than the Canadian status quo.

However, there are a few caveats with regard to shared goals within environmental CBRs. First, the nature of "shared" regional goals requires closer scrutiny. In many cases, where there is a specific goal or target, the target applies region-wide rather than to individual jurisdictions. For example, the WCI partners have set an aggregate GHG reduction goal; their "Statement of Regional Goal" declares that "this regional, economy-wide goal is consistent with the emission goals of WCI partners and does not replace the partners' existing goals (Western Climate Initiative 2007). As a consequence, individual jurisdictional goals can—and do—vary from those that are jointly adopted.

As a second point, goals endorsed in annual meetings of premiers and governors, while laudable and designed to provide some measure of political accountability, do not acquire the force of law—and galvanize implementation action—until they are embedded in legislation. And only rarely has that happened, particularly on the Canadian side.

And finally, sometimes policy goals may not take the form of specific targets related to environmental quality at all, but rather may be more process- or task-oriented, e.g., "protecting habitat" or "improved reporting/monitoring." Such is the case with many of the goals directing activity in the Great Lakes and in bodies such as the Gulf of Maine. Such goals direct participating jurisdictions to perform tasks, but it is not known whether those tasks improve environmental quality to a measurable degree.

There is another conundrum: shared policy goals are not necessarily proximate to the actual depth of commitment to those policy goals on the part of participating governments. The literature is full of examples of environmental agreements whose goals have been endorsed, even formally, but have not been met by participating governments. Kyoto is a recent, high-profile example.

As such, policy instrument choice, which refers to the actual means that governments devise to achieve policy goals, may be a better indicator of the depth of commitment to cross-border cooperation on environmental protection, than policy goals per se. It goes without saying that a willingness to incur the political and material costs associated with regulation, or with taxing environmentally unfriendly behavior, indicates a higher level of commitment on the part of government to environmental protection than does, for example, a voluntary "challenge" issued to industry to change.

Compared with environmental goals, the impact of environmental CBRs on the choice of policy instruments for carrying out those goals is much more indirect. In fact, until very recently, the focus primarily has been on achieving shared goals and then compatibility of policy instruments, not generally on the adoption of the same policy instruments.

In the early phase of the NEG/ECP Action Plans, the policy instrument choices of American states and Canadian provinces were quite different. States participating in the NEG/ECP Climate Change Action Plan were from the beginning more likely to adopt a range of policy instruments, including regulatory targets for reductions in GHG and tailpipe emissions, alternative energy generation, incentives for energy conservation, and the RGGI emissions trading system for the electricity sector. By contrast, eastern Canadian provinces were more likely to rely on voluntary challenges to reduce emissions, including negotiated nonbinding emissions reductions agreements with industry and public education programs to encourage energy conservation (New England/Eastern Canada Climate Change Report Card

Partners 2006: 16-20). There was initially little interest in regulated emissions reductions, alternative energy mandates, or market-based instruments such as cap-and-trade regimes. Implementation plans for the NEG/ECP's Mercury Action Plan showed a similar trend.

More recently, there are signs of convergence creeping into policy instrument choice, some examples of which are shown below:

- Québec has formulated a comprehensive 2006-2012 Action Plan for climate change that includes a duty on gasoline and fossil fuels, new tailpipe emission standards (on the California model), alternative energy targets, and regulated reduction targets for various industrial sectors.
- In December 2005, Prince Edward Island passed a Renewable Energy Act requiring utilities to acquire at least 15 percent of electrical energy from renewable sources by 2010—with plans to substantially increase this mandate.
- British Columbia has instituted both a cap on emissions and a carbon tax.
- Ontario, Québec, Manitoba, and British Columbia are in the process of joining the state-led WCI and have called on other provinces to take part.

Indeed, Québec Premier Jean Charest has publicly mused that it is only a matter of time before all provinces and territories follow the United States and unite behind a common approach—a cap-and-trade system for GHG emissions (Laghi 2008).

As perhaps another signal of this trend, an empirical case study conducted by this author found that almost a decade after negotiating the NEG/ECP Mercury Action Plan, there is growing convergence among the six New England states and the five eastern Canadian provinces with respect to policy instruments advocated in the plan (VanNijnatten 2006d: 29-30). Among the six New England states, clustering is very much in evidence; all six states have endorsed the reduction target and those states with air emissions sources tagged in the Action Plan (utility boilers, incinerators, etc) have, for the most part, adopted limits more stringent than federal standards. There is also some clustering in terms of mercury-containing product restrictions, disposal objectives, and notification requirements among New England states.

The Atlantic provinces also have endorsed the NEG/ECP target and have adopted some mercury policy instruments that are consistent with the Mercury Action Plan, although they have not been as active as New England states. Instead, Atlantic provinces, like states, have been most active in regulating point sources associated with atmospheric mercury releases, to that end adopting similar disposal and notification requirements.

The implication is that participation in CBR initiatives has not only encouraged provinces and states to adopt more ambitious goals, it has also encouraged provinces to employ regulation as well as alternative (particularly market-based) policy instruments. But more detailed studies are needed in order to definitively ascribe these trends to the influence of environmental CBRs.

> "The original impetus for the Great Lakes Charter was concern on the U.S. side among states that there would be major demands on the basin's water resources in the future.

Finally, beyond goals and instrument choice, of utmost importance to those concerned about transboundary environmental governance is whether CBRs are having a discernible impact on environmental policy outcomes, that is, environmental quality as measured in levels of pollutants in ambient air, water, soil, or plant and animal life. While it is still too early to answer this question, there are a few trends worth noting.

First, while environmental CBRs are a relatively new phenomenon, particularly when compared with bilateral environmental governance, one can already see a greater focus on "results," as expressed in specific goals and objectives relating to environmental quality accompanied by report requirements. For example, the Gulf of Maine Council has resolved to become a more "results-based organization" (Tremblay

interview). The NEG/ECP moved from "facilitating" action in its early years to negotiating action plans with specific targets. The Great Lakes Charter requires its members to evaluate water use on the basis of "environmental harm," although the specific metrics are still being studied and negotiated. The Powering the Plains initiative, which originally consisted of a statement to cooperate, now has incorporated a long-term GHG reduction target. Significantly, such initiatives are increasingly accompanied by reporting requirements.

Various factors might account for this shift. First, programming with more specific targets is more likely to attract federal funding, especially on the U.S. side. And it also appears that where CBR insitutions are stronger and share more specific environmental policy goals, the result is greater success in achieving desired outcomes. The New England CBR provides the best example of that success. Under the NEG/ECP Mercury Action Plan, participating jurisdictions agreed to undertake 45 pollution reduction actions with respect to point sources, waste management, and public education. Currently it is estimated that the interim goal of a 50 percent reduction by 2003 (from 1998 levels) has been achieved (Smith 2005). Progress on the Climate Change Action Plan has been considerably slower, but even that is only known because of mandatory reporting requirements that are exerting their own form of pressure on governments to take more decisive action, especially on the Canadian side.

CONCLUDING OBSERVATIONS

The observations in this paper are directed towards a premise established in earlier research: that cross-border environmental initiatives between the United States and Canada are to an increasing degree taking place at the subnational level, where interactions have become more formalized, are increasingly multilateral or regional in orientation, and seem more ambitious in terms of the projects undertaken. Hope for environmental solutions that was once directed at the national level, to the IJC and then the CEC, is now being directed downward, to state, provincial, and local governments and environmental policy-making organizations.

The hypothesis, then, is that it might be possible to reconstruct the Canada-U.S. environmental relationship from the "bottom up," recasting it according to a subnational model of environmental CBRs rather than remaining solely focused on bilateral (i.e., nation-to-nation) entities. Addressing this proposition, several questions were explored. First, are there established environmental CBRs functioning along the U.S.-Canadian border? Second, are those environmental CBRs capable of action by means of articulating and acting on regional goals through joint institutions? And last, are they having a meaningful impact on environmental policy making in terms of goals, mechanisms for action, and outcomes?

Without repeating the findings that led to these observations, the empirical evidence presented here suggests that the Canada-U.S. environmental relationship has evolved towards a series of three developing environmental CBRs which are not, however, equally capable of occupying and operationalizing transboundary policy spaces. While the most advanced of the three, the New England region, appears capable of undertaking coordinated, targeted action on larger policy issues, and has developed the institutional machinery to support these efforts, the Pacific Northwest is at an earlier stage in terms of both institutional and policy development. The third CBR functioning in the Great Lakes area exhibits many of the characteristics of an active, institutionally mature CBR but has experienced difficulties in terms of undertaking region-wide initiatives.

> "Participation in CBR initiatives has not only encouraged provinces and states to adopt more ambitious goals, it has also encouraged provinces to employ regulation as well as alternative policy instruments.

Asymmetries among environmental CBRs could pose problems if the shared regime for environmental governance between Canada and the United States is to be reoriented from the "bottom up." As a result, even though cross-border regional cooperation of this subnational nature has encouraged more ambitious policy goals and consideration of a wider range of policy instruments to achieve these goals, there remain serious questions about the prospects of achieving effective environmental governance at subnational hands. Overall, such efforts do not seem to be as cohesive and directed as they might be.

On the positive side, there are encouraging trends toward establishing specific initiatives with measurable goals and objectives, and a horizontal diffusion of influence. As an example, one has only to witness the spread of WCI across the northern and western portions of the continent.

The problem of uneven effort and capacity across regions, paradoxically, suggests a role for federal governments in addressing these asymmetries, for instance by facilitating policy change at the national level in order to foster cross-border project implementation and providing concrete support and resources.

Given current political dynamics, it seems possible that environmental CBRs, as a model of subnational transborder governance, offer the best prospect of becoming "hubs" for future cross-border environmental cooperation between the United States and Canada, albeit with a firmer national backdrop encouraging their institutionalization. Interestingly, on the U.S.-Mexico border, a strong if under-resourced federal framework undergirds a now decentralized, regional approach to cross-border environmental planning and cooperation. It may be that folks on the northern border need to look to their southern counterparts for inspiration.

NOTES

1. The first iteration of the research findings, funded by by the Social Sciences and Humanities Council of Canada, has been published as: Debora L. VanNijnatten, "Towards Cross-Border Environmental Policy Spaces in North America: Province-State Linkages on the Canada-U.S. Border," *AmeriQuests: The Journal of the Center of the Americas* 3 no.1 (2006). Available at: *http://ejournals.library.vanderbilt.edu/ameriquests/viewissue.php?id=7*.

2. The objective of the Policy Research Initiative's Emergence of Cross-Border Regions Project was to substantiate the growing significance, scope, and nature of cross-border regional relationships, as well as to investigate the policy implications for the Government of Canada. As one component of this Project, the PRI conducted a survey of U.S. and Canadian leaders in various government jurisdictions, Chambers of Commerce, cross-border associations, NGOs, and think tanks. This author was an academic advisor on the project.

3. One much-used classification scheme is Bailey's Ecoregions of the United States: U.S. Forest Service, Department of Agriculture, Description of the Ecoregions of the United States. Available at: *http://www.fs.fed.us/land/ecosysmgmt/ecoreg1_home.html*.

4. As part of its North American Linkages research project, Policy Research Initiative (Government of Canada) researchers and three university academics (including this author) constructed a detailed 12-page Elite Survey, the purpose of which was to examine the nature of relationships and interactions at the cross-border level. Respondents were surveyed from the four cross-border regions outlined by the PRI and from a range of organizations—provincial-state governments, cities, nongovernmental organizations, think tanks, Chambers of Commerce, regional economic development agencies, and associations. A total of 547 people were contacted and received the survey. One hundred individuals completed the survey, for a response rate of 19 percent. Surveys were completed between July 20 and October 7, 2005.

5. As a first step in building the database, existing studies were consulted, such as Swanson (1976), Stein and Grenville-Wood (1984), Canada School of Public Service (2004), as well as the CEC Transboundary Agreements Database. Research was then conducted in order to determine whether additional linkages could be discovered. Preliminary lists of linkages—including the name, date of establishment and membership—were then sent to each state and province for verification. Input from state and provincial officials resulted in deletions from the database, as additional linkages were declared inactive. A few additions also resulted from the verification process. Particular conditions were imposed for the inclusion of state-province linkages in the database. First, there must be some form of documentation on the linkage which provides evidence of its existence and nature and, second, states and provinces must be the primary agents of the linkage. The database is current to the end of 2005.

6. Table 2 provides data for all state-province pairs that share at least 10 environmental linkages, out of a total of 200 possible pairs. In addition to states located adjacent to

the border, provinces were also paired with Oregon and California in the West and Massachusetts, Connecticut, and Rhode Island in the Northeast.

7. A score of greater than 1.0 indicates a region in which linkages are relatively more likely to be bilateral while a score of less than 1.0 indicates a greater tendency toward multilateralism in terms of environmental linkages.

8. The newer 2001 Charter Annex actually consists of one agreement between the eight Great Lakes states and another between the states, Ontario, and Québec, although the two agreements are similar in terms of content. Further agreements to implement the Charter's overall goals have also been signed by states and provinces.

9. Other U.S. and Mexican states as well as Canadian provinces have joined as observers, with some moving toward full participant status, including Ontario and Québec.

10. In some cases, we used the date when a linkage became truly cross-border, i.e., a province joined an established inter-state organization.

11. Please note that "horizontal" and "vertical" concepts differ slightly from those used by Slaughter, who refers to horizontal networks as those among national government officials in different countries in their respective issue areas, whereas here the horizontal dimension extends outward to include the private sector and civil society. Slaughter refers to vertical networks as those which tie supranational organizations to domestic governments; here the vertical dimension extends downward to encompass various levels of government—national, subnational, local.

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Chapter 9: Transboundary Environmental Governance in the Pacific West

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Contemporary environmental problems are as much about ecosystems and basins as they are about borders. In the Pacific West, these problems increasingly have been framed in ways that reflect different scales, interests and conceptions of natural and social systems—pitting, for example, the imperatives of hydropower against dam removal and survival of fish species in the Columbia River basin. In addressing such dilemmas, the role of national governments has lessened as subfederal political entities and nongovernmental organizations have mobilized, innovated and led efforts to find solutions across state and provincial borders. Case studies reviewed here suggest several factors that appear to contribute to success. First, it is important to have a proper "fit" between the problems at hand and the institutional and organizational responses to them, including spatial proximity of issues and actors, which helps encourage personal relationships, networking and bureaucratic transparency. Second, intersectoral cooperation among political officials, citizens, and economic and environmental groups is a crucial element in developing capacity for regional policy making—and especially so within the context of "place-based environmentalism," where saving a valley or watershed relies on mobilizing associations of activists, scientists, local officials and property owners. Third, success also depends on the leadership of individuals willing to "champion" the cause of transboundary cooperation on environmental issues, and it helps when such leaders have preexisting bonds and working relationships. However, meshing the policy agendas of state and provincial governments with the environmental and resource perspectives of local communities remains a challenge.

INTRODUCTION

Within the Pacific West of North America, transboundary environmental politics are shaped by geography and economic interdependencies. British Columbia (B.C.), the Yukon and adjacent U.S. states share marine and fresh water basins, forests and airsheds. The sheer richness of the region's natural bounty has made for a continual and at times contentious struggle over resource allocation and use. Disputes over salmon have led to binational allocation agreements and creation of management institutions. Issues concerning the discharge of industrial wastes into transboundary rivers have involved complex diplomatic and legal efforts. The bisecting of terrestrial wildlife habitats by the border has prompted joint action, including the creation of parks and protected areas. The effects of pollutants in heavily urbanized border regions have spurred environmental action to protect shared airsheds. It is

clear that imperatives of resource sharing and pollution abatement in transboundary regions have been the impetus for common agendas. These same realities, however, have often caused lingering disagreements, thereby straining cross-border relations.

Transboundary environmental politics tend to focus on problems caused or exacerbated by jurisdictional borders. Yet, borders also provide opportunities for multi-jurisdictional policy alignments at a regional scale. For example, multiple coastal jurisdictions may leverage their collective power by coalescing across borders to create an integrated oceans' policy. From this perspective, borders may serve to motivate policy efforts.

This chapter first briefly discusses the geographical and historical contexts of regional transboundary environmental politics. Next, we examine the notion of Cascadia and other regional imaginings and ask what, if any, is their relation to cross-border environmental agendas and politics. The major section of the chapter examines institutional structures that have shaped, and been shaped by, transboundary environmental politics in the region. Much of the cross-border interaction occurs at the local and regional levels where numerous interagency processes, nongovernmental organizations (NGOs), working groups and practical problem-solving efforts are found. Examination of several case studies reveals deficiencies, but also opportunities in existing institutional structures. We conclude with an assessment of the relationships between national, regional and local processes and how they relate to the future of environmental governance in the region.

POLITICAL-HISTORICAL CONTEXT OF TRANSBORDER ENVIRONMENTALISM

Like elsewhere on the continent, the history of bilateral environmental relations in the Pacific West generally was played out on the national political stage with the two federal governments defending their interests over fish allocations, water rights and industrial practices. In this regard, federally created binational institutions and processes form an important backdrop for environmental politics.

The cornerstone of Canada-U.S. environmental binationalism is the International Joint Commission (IJC), created by the Boundary Waters Treaty of 1909. As discussed elsewhere in this book, the IJC's main focus has been on water quality issues in the Great Lakes, although it has played key roles in many transboundary issues in the West. In particular, the IJC was instrumental in the Trail Smelter arbitration, which dealt with a conflict over emissions from a Canadian smelter that polluted a downwind valley in Washington State (Murray 1972); the Columbia River Treaty, which concerned flood control and power development in the binational Columbia basin (Swainson 1979); and settlement of the Skagit/Ross Dam controversy over the proposed raising of the Ross Dam on the U.S. side of the transboundary Skagit River and potential flooding of a B.C. valley (Alper and Monahan 1986).

In recent years, the IJC has taken more of a back seat stance on transboundary watersheds' issues in the far West, while local, provincial and state actors have moved to the forefront. In general, the subfederal-level officials have developed the attitude that province-state arrangements are sufficient to manage most transboundary water issues (International Joint Commission 2000; Springer 2007). Yet, despite this "go it alone" attitude, and the growth in regional environmental policy innovation, federal-level agreements, relationships and resources remain a vital part of the cross-border environmental governance equation.

Fishery matters, the most contentious issues in the region, have been governed primarily by bilateral agreements at the federal level. The most important is the Pacific Salmon Treaty of 1985, re-negotiated in 1999. The Treaty established a management framework designed to prevent over-fishing and unfair allocation of the resource between the two countries.

The Canada-U.S. Air Quality Agreement has provided a framework for cooperation to reduce industrial pollutants and the flow of ground level ozone across the Canada-U.S. border. Implementation of the agreement at the B.C.-Washington regional level has produced interagency airshed quality accords aimed at aligning

and coordinating policies.

Since the 1970s, marine water quality in the Georgia Basin-Puget Sound has been a major bilateral environmental issue. Early on, concerns were raised about the risk of oil spills from tankers plying these inner waters. More recently, pollutant discharges from industry and sewage systems have provoked calls for cooperative transborder efforts to manage the entire Georgia Basin-Puget Sound bioregion. In 2008, congressional representatives from Washington State introduced federal legislation to support recovery efforts for the Puget Sound. The legislation was an attempt to bring the federal spotlight on the deteriorating conditions of the sound and with it national attention and infusion of federal dollars for restoration (Stiffler 2008: B-1).

International initiatives focused on wildlife conservation have been another important component of binational environmental cooperation. For example, a North American Waterfowl Management Plan provides a framework for conserving and protecting critical habitat in the main flyway for bird populations migrating from the northern to southern hemispheres. This flyway runs directly through the region. Canada and the U.S. have an agreement to protect the porcupine caribou that migrate cross the Alaska-Yukon border. At the trilateral level, the North American Agreement on Environmental Cooperation (NAAEC) and its institutional offshoot, the Commission on Environmental Cooperation (CEC) links Canada, the United States and Mexico for the purpose of increasing trilateral environmental cooperation.

Since the 1980s, subfederal-level political actors have become key sources of innovation and leadership on environmental matters (Springer 2007; VanNijnatten 2003; Gutierri 1997; Alper 1997). Assisted by a strong environmental movement, what has emerged is a governance framework in which bottom-up impulses from citizen activists and government agencies bump up against higher levels of authority creating multifaceted hybrid institutions and processes.

THE FORCE OF ECOLOGICAL REGIONALISM?

For generations, notions of an integrated ecological north Pacific West have been advanced by visionaries (Sparke 2000). Ernest Callenbach in Ecotopia (1975) talked about a bioregional state that would encompass much of the coastal zone reaching from Oregon to the northern coast of British Columbia. This was expanded upon by Joel Garreau in his well-known book, *The Nine Nations of North America*, published in 1981. Garreau's ecological boundaries extended from northern California to Alaska. In years since, David McCloskey (1995) and others have drawn ecological boundaries on the basis of regional watersheds, the territorial range of Pacific salmon, rain forests and other natural processes (Todd 2008; Robbins 2001; Findlay 1997; Bunting 1997; Egan 1991).

The ecological regionalism perspective is fueled by the reality of the sheer amount of public space of environmental significance that frames the borderlands in the Pacific corner of the continent (Konrad and Nichol 2008). Virtually the whole of the Alaska Panhandle, which borders on British Columbia and the Yukon, is encased in lands which are part of parks or protected areas. Similarly the 49th Parallel borderlands between the Rockies and the B.C.-Washington coast are punctuated by parks, wilderness reserves and proposed marine protected areas. These expanses of relatively unspoiled natural areas have made the region something of an ecological showcase for the world, and, as a result, a magnet for environmental activists in Canada, the United States, Europe and elsewhere.

Although notions of ecological regionalism have been articulated mostly by writers, they also have been expressed in the plans of political entrepreneurs, various international organizations and some environmentalists. The Cascadia Project, formed in the early 1990s by a former congressman from Seattle, envisioned a transborder sustainability agenda that would accompany a planning effort for improved cross-border regional transportation and economic competitiveness in the corridor between Portland, Oregon and Whistler, B.C. *(www.cascadiaproject.org/about.php)*. The Pacific Northwest Economic Region (PNWER), a binational regional advocacy group that joins five Pacific Northwest states with B.C., Alberta, Saskatchewan and the Yukon, is "dedicated to

encouraging economic competitiveness and preserving our world class natural environment" (*www.pnwer.org*). The environmental NGO communities in the B.C.-Pacific Northwest region are among the most numerous and active in North America, although there are very few which are explicitly transboundary in organization and goals (Alper 2004). The popularized sustainability paradigm following the 1992 Rio Earth Summit encouraged Canadian federal and provincial governments to institute "roundtables" as planning mechanisms for environmental sustainability. The British Columbia Roundtable on the Environment and the Economy, mandated in 1992, considered ways to manage the Puget Sound Georgia Basin region as a whole, including strategies for working with the adjacent U.S. state across the border. A broad-based regional ecosystem plan was conceived by the Georgia Basin Ecosystem Initiative in 1998, followed by the signing of the Joint Statement of Cooperation on the Georgia Basin-Puget Sound Ecosystem by the Canadian and U.S. federal governments in 2000, the Georgia Basin Action Plan in 2003, and the Georgia Basin-Puget Sound International Airshed Strategy in 2005.

At the continental level, the Georgia Basin-Puget Sound basin and coastal areas of Vancouver Island and the Olympic Peninsula have been designated by a CEC trilateral team of resource scientists and managers to be a Priority Conservation Area (PCA) as part of the Baja California to Bering Sea (B2B) conservation vision (Marine Priority Conservation Areas 2005). The B2B project views the rich coastal region as a series of linked marine environments which form the building blocks of north-south marine protected areas for biodiversity on North America's West coast (Tsao, et al. 2005). Such largescale cross-border ecological imaginings in the Pacific West have not been limited to the coastal zone. Many plans have been drawn up for vast international wilderness parks on both the north coast and southern interior. Perhaps the most ambitious cross-border vision is the Yellowstone to Yukon (Y2Y) network that has coalesced around land, water and other resource-related issues in the region stretching from approximately Yellowstone National Park to the Mackenzie Mountains in the Yukon.

The impact of ecological regionalism on the politics of cross-border environmental relations is unclear. Alper and Salazar (2006) found little evidence of transboundary identity among border-crossing environmentalists. Other evidence suggests stakeholders from each side of the border often view conservation goals differently, which presents a possible barrier to cross-border planning (Liebow et al. 2004). Konrad and Nicol, on the other hand, postulate a "Cascadia effect" among western borderlanders which "is not evident to (eastern) borderland residents" (2008, 10-11).

"Ecological regional consciousness... has yet to be reflected in groundbreaking regional policy actions that are significantly more than individual domestic initiatives pursued by their respective jurisdictions.

The so-called Cascadia transboundary region has built a reputation for leadership in green public policy and environmental awareness. The B.C. Land Act, enacted in 1973, is an early example of forward-looking province-wide zoning to preserve agricultural land. Oregon has enacted similar urban growth zoning. Vancouver has been a world leader in promoting urban sustainability (Smith 2004). Despite its decrepit transportation system, Seattle has been named as one of the top 10 green cities by National Geographic's Green Guide in 2005, and by the San Fransciso-based Sustain-Lane in 2007 (Bula 2007). Politicians constantly boast about the region's leadership in environmental stewardship. The annual Cascadia Scorecard reports impressive regional performance in the areas of public health, access to clean water and clean air, although the cross-border region continues to use energy inefficiently and scores poorly on wildlife protection (Todd 2008). Ecological regional consciousness, either at the elite or non-elite levels, has yet to be reflected in groundbreaking regional policy actions that are significantly more than individual domestic initiatives pursued by their respective jurisdictions.

BINATIONAL INSTITUTIONS AND AGREEMENTS

Economic development considerations and state interests have been paramount in framing cross-border resource issues and shaping institutions for dealing with them. As cross-border environmental issues have changed, new institutions and relations of authority have evolved. Higher level authority based on legal arrangements and economic interests has had to confront the participatory impulses, local processes and pragmatism that are evident at the lower levels. To provide a context in which to assess these shifting relations of authority, we next turn to an overview of three key bilateral accords which reveal many of the characteristics of evolving environmental governance: The Columbia River Treaty, the Pacific Salmon Treaty and the Skagit River Treaty.

The Columbia River Treaty

The Columbia River Treaty, signed in 1964, was initiated by the United States for the purpose of supplying hydropower to rapidly growing cities in the Pacific Northwest and also to improve flood control. The agreement called for the construction of three dams in British Columbia to increase hydropower capacity and control flooding on the U.S. side. In return, Canada (British Columbia) would receive a one-time cash payment and a share of the additional power generated by the new dams. The agreement was (and remains) controversial because of the belief among many Canadians that the power was sold too cheaply. The Treaty has no specific end date. However, either government may terminate the Treaty after 60 years (2024), with 10 years advance notice.

By the 1980s, political managers, pressured by NGOs, were seeking new mechanisms to balance hydro demands with salmon conservation. In the 1990s, controversies over salmon restoration on the U.S. side involved at least three political aggregations—tribal groups, federal agencies involved in river management, and four principal basin states (Washington, Montana, Idaho and Oregon). On the Canadian side, environmental activists and First Nations were joined by community groups demanding compensation for entire communities displaced because of alterations to the Columbia. This led to the creation of the Columbia River Trust in 1995, a British Columbia crown corporation, which functions to return money to communities most severely affected by the building of the dams.

The Columbia River transboundary management system is tied to the Columbia River Treaty entities—in Canada, B.C. Hydro, and in the United States, the U.S. Army Corps of Engineers and Bonneville Power Administration (BPA). Activities conducted under the Treaty are regulated by numerous and overlapping Canadian and U.S. federal and provincial bodies. In recent years, public stakeholder groups have become more influential. Especially noteworthy is the incorporation of native perspectives in management institutions through organizations such as the Canadian Columbia River Inter-Tribal Fisheries Commission and the Columbia River Inter-Tribal Fish Commission, based in the U.S. (Mattison and Moore n.d.). The Columbia Basin Water Transactions Program was started in 2003 by the National Fish and Wildlife Foundation (NFWF) and the BPA to support grassroots strategies for improving instream flows in Columbia basin streams and rivers (*www.nwcouncil.org/fw/program/2008amend/cbwtp.pdf*). A joint cross-border International Columbia River Basin Center of Information was created in 2006 by the CBT and Northwest Power and Conservation Council to increase public understanding of interconnected issues on both sides of the border.

Despite this proliferation of institutions, the Columbia River management system is severely challenged by the competing demands on the river and its watersheds. Several salmon and steelhead populations have been listed as endangered under the U.S. Endangered Species Act, resulting in demands for dam removals, more localized watershed management and greater sensitivity to the livelihoods and culture of native people. Biologists have discovered new fish populations under threat. Scientists warn that climate change is already affecting winter snow packs and spring melt, resulting in alterations in the flow pattern of the river (Cohen 2006, Gosal 2006).

Finding effective solutions to complex resource management problems in this large multi-state/Canada region will be no easy task. The key problem is creating a management structure that is accountable to regional and local communities and values, yet capable of responding to the needs of a basin-wide ecological system under strain (Muckleston 2002; Day et al. 1996).

In summary, then, the Columbia River Treaty is the institutionalization of joint authority between Canada

and the United States to govern the use and development of the Columbia River. The Treaty was a functional response to specific resource needs (hydropower and flood control). The production of hydropower is paramount, and will remain so because of climate change concerns and the vital Columbia River hydropower linkages to the Pacific Northwest, California and other Southwest energy markets. Future environmental governance efforts will need to work within this context and try to reconcile the hydropower imperative with other social and environmental values.

The Canada-U.S. Pacific Salmon Treaty

The Canada-U.S. Pacific Salmon Treaty, first signed in 1985 and renegotiated in 1999, sets the conditions for managing this valuable resource. Pacific salmon migrate long distances, spending several years at sea. In the course of the migratory patterns, fish from Canadian and U.S. streams enter the fishery zones of both countries. If fish spawned in U.S. waters are harvested by Canadians, or vice versa, they are considered to be intercepted by fishers from the other country. Fish interceptions complicate a primary treaty goal of achieving equity. Further, the random capture of stocks in the open sea disrupts the natural cycle of salmon and thus undermines the efforts of managers to achieve another goal, that of biological sustainability of the resource.

The Canada-U.S Salmon Treaty created a Pacific Salmon Commission (PSC) with responsibility for ensuring that salmon are conserved to "achieve optimum production" as well as for allocating fish catches between the two countries (*www.bcwatersheds.org/issues/water/bcgwlp/s4.shtml*). The PSC created six fishing regimes, spanning the West Coast from Southeast Alaska to California. Each regime specifies arrangements for specific stocks and rivers, all with the goal of managing for the conservation and harvest sharing of intermingled north Pacific stocks. Thus, trade-offs involving who gets to harvest what portion of the resource are driven by attempts to balance competing values of equity, conservation and commercial fishing interests. This model serves political interests and national claims, but ignores biological coherence (Ebbin 2003; Taylor 2002).

Habitat protection, always problematic in the treaty's attempt to balance competing pressures on the resource, has become a critical environmental issue. In 2007 an independent scientific workshop was convened by the Pacific Salmon Treaty Reform Coalition, consisting of U.S. and Canadian conservation groups. The coalition's purpose is emblematic of shifting environmental thinking: to reevaluate the Pacific Salmon Treaty as a vehicle for sustainable, conservation-based salmon management. In short, the group exhorted each country to manage the resource from the perspective of habitat protection and called for more transparency and public participation in current and future Pacific Salmon Treaty negotiations. (CRS Report for Congress 2007, 39)

Like the Columbia River Treaty, the management regime created by the Pacific Salmon Treaty is narrowly based and not easily adapted. As a framework for complex environmental governance, the system suffers from an intentional bias toward the interests of harvesters, sovereignty considerations and scientific systems. As a consequence, it is unable to strike a proper balance between the socioeconomic system surrounding the salmon fisheries and the delicate ecosystem that sustains it.

The Skagit River Treaty

The 1984 Skagit River Treaty resolved the conflict over raising the level of Ross Dam and the resultant flooding of Canadian territory. The issue arose with the perceived need of a Seattle utility (Seattle City Light) to continue raising the height of its power-producing Ross Dam on the Skagit River. The Skagit has headwaters in British Columbia before crossing the border in the North Cascades and flowing into the Puget Sound near Mt. Vernon, Washington. Beginning in 1942, the IJC authorized Seattle City Light to raise the height of the Ross Dam in stages in accordance with future power requirements. Incremental raisings occurred until the late 1960s, when Canada had second thoughts. Environmental concerns, fanned by well-organized activist groups, focused on saving the Skagit Valley behind the dam. There was also the claim made by Canadians that monetary compensation for the spoiled valley was inadequate.

Following many years of jousting between federal and subfederal-level officials on both sides of the border, and a series of court battles, serious negotiations aimed at resolving the impasse began in 1981. A major factor in getting the parties together was the intervention of the IJC, which inserted itself directly into the conflict. In the end, the issue was resolved by the parties agreeing that the dam would not be raised—and therefore the B.C. valley would be saved—but equivalent power would be provided by another B.C. source to Seattle City Light.

This issue, which in many respects has proven to be an exemplary case of transboundary environmental governance, yields several lessons worthy of discussion. For one thing, the negotiating parties were comprised not of the usual formal diplomatic authorities, but, instead, of a highly unusual team made up of the deputy mayor of Seattle, Bob Royer, and the deputy minister of British Columbia, Ben Marr. The groups developed strong links with community groups and regional stakeholders. Further, these two negotiators, moreso than national diplomats, were relatively free to explore unconventional negotiating processes and solutions. In the end, these two individuals and their associates were able to transcend narrow nation-based advocacy positions and define the problem in terms of the general interests of both sides. In effect, the interest of the environment became at least co-equal to the interest of increased hydropower.

A second lesson relates to the role of the IJC. Without question the IJC was critical to getting the two sides to begin serious negotiations in 1981. In large part this was due to the fact that the IJC had two commissioners who were known to be close to their respective heads of governments and were therefore perceived as heavyweights. These two commissioners were knowledgeable about the issue at hand and worked well together (Alper and Monahan 1986).

Still another lesson concerns the results. The agreement produced an outcome perceived as a 'win-win' for both sides. Once the focus was shifted from the dam to the matter of power equivalency, a path to resolution was in hand. Thus, a further lesson that should be applicable to other cross-border issues is that the negotiations included "added benefits" beyond the specific issue at hand (Alper and Monahan 1986). An added benefit was the creation of an environmental endowment plan to provide protection and improvement of the environment in the American and Canadian portions of the Skagit Valley. In addition, the treaty created a separate Skagit Valley Endowment Fund and a joint bilateral commission, the Skagit Environmental Endowment Commission, to manage it.

What impact have these three national treaties had? A comparative analysis.

How can these cases and the various mechanisms of environmental governance be compared? All three agreements and the institutions supporting them were created by national governments, albeit with the active involvement of subnational actors and societal interests. It is instructive that the Skagit Treaty, perhaps because of its relatively narrow scope, resulted in a management structure that has been, by virtually all accounts, highly successful. Like the others, at its core and giving rise to the treaty was a dispute involving competing interests and values. But unlike the others, what seems to be a well conceived watershed management process has been put into place as a result of the treaty process.

What can be learned from these cases of environmental governance? National-level agreements and treaties involving resource issues tend to focus more on economic and political interests and less on the environment. Such agreements typically frame issues as problems among resource-user groups and, therefore, solutions are reflective of groups' interests and agendas. These high-level agreements and the organizations formed to support them are generally not designed to bring together diverse stakeholders to deal with complex ecosystem problems. In their analysis of transboundary water governance, Perry, Blatter and Ingram (2001, 325) argue for modes of governance in which "outcomes depend less on nation-state sovereignty than upon sub, supra, or para-state initiatives undertaken within the framework of a shared, well-defined regional environmental discourse." A robust discourse of this kind depends on engaged communities of stakeholders arrayed across various levels of government. In this regard, it may be useful to look at the Skagit Environmental Endowment Commission as a model.

SUBNATIONAL CROSS-BORDER INSTITUTIONS

Subnational initiatives and institutions have proliferated, especially those linking political officials in Washington State and British Columbia. According to VanNijnatten's (2006) continent-wide study of pairs of province-state environmental linkages, the Washington-British Columbia state-province pair has the highest number of bilateral institutional mechanisms. In terms of functions plotted on VanNijnatten's five-point continuum ranging from information sharing to integration, the Washington-B.C. linkages tend to focus on "cooperation," defined as activity that is more than information sharing, and where "the focus is on actually working together" (2006, 11). "Hard" governance instruments, such as regulatory authority and dispute resolution mandates, are not part of these transboundary mechanisms (Day and Calbick 2008). An overview of subnational transboundary arrangements—institutions, agreements, memoranda of understanding, etc.—in the Pacific West confirms VanNijnatten's (2006, 18) findings that although "linkages have become more numerous, they are not more intense." What is also evident by looking at VanNijnatten's study and the work on cross-border regions produced by the Ottawa-based Policy Research Institute (*www.wilsoncenter.org/events/docs/prippt.pdf*), is the importance of British Columbia and Washington state in anchoring cross-border relations of all kinds in the Pacific Northwest. The leadership roles of the province and state have been enhanced by high level "championing" exerted on the part of several B.C. premiers and Washington State governors.

The most soundly institutionalized subnational transboundary environmental governance structure in the region is the British Columbia-Washington Environmental Cooperation Council (BCWECC) and its off-shoot task forces, which in themselves have become institutionalized. Because the BCWECC has been considered a potential model, and has been replicated in Montana and Idaho, it will be examined and assessed.

The British Columbia-Washington Environmental Cooperation Council

In 1992, ineffective responses to an oil spill which occurred off the Washington State coast and drifted north to foul the beaches of Vancouver Island was a significant factor in the signing of the British Columbia-Washington Environmental Cooperation Agreement (Alley 1998). The purpose of the agreement, signed in 1992, was to foster coordinated action and information sharing on environmental matters of mutual concern, because "environmental concerns and impacts respect neither physical nor political boundaries" (*www.env.gov.bc.ca/spd/ecc/docs/bcwaccord.pdf*). The agreement in turn led to the creation of the BCWECC, whose mission was to work binationally on marine water quality issues. Upon its formation, the BCWECC created a Marine Science Panel and the Georgia Basin-Puget Sound International Task Force. It then identified four other priority areas and created task forces to address each one. The transboundary areas of concern were air quality in the Fraser Lowland; deteriorating quality of the Abbotsford-Sumas aquifer; flooding in the Nooksack River (which runs north into British Columbia), and air and water quality in the Columbia River basin.

The BCWECC has been successful in bringing together key environmental actors from all levels of government to exchange information on transboundary water and air issues. Through its task forces, the Council has provided a structured form of cross-border communication in specific problem areas and has facilitated planning and mitigation efforts. As Carruthers (2006, 86) notes, "much of its success has been due to casting difficult local issues bottom-upward into a wider regional and scientific context." It has also successfully depoliticized binational marine water quality issues by "reducing them to policy issues approachable through scientific and technical collaboration" (Carruthers 2006, 86). Further, the BCWECC, through meetings, workshops and reports, has effectively mobilized a cross-border effort to investigate and monitor marine pollution trends and impacts on habitat (Day and Calbick 2008).

The BCWECC is, however, quite limited in what it can accomplish in the policy realm because it lacks independent, stable funding and has no regulatory power (Day and Calbick 2008). Carruthers (2006, 68) observes that the BCWECC is advisory in nature and thus cannot spell out the rules to be followed. Organizationally, the council's terms of reference reflect an unwillingness of Washington state and British Columbia to pool environmental authority in the Council. This makes it all but impossible to conduct integrated planning. Instead, the Council and its task forces engage in parallel processes

(Harris et al. 2001).

In perhaps the most comprehensive assessment of the BCWECC as a transboundary environmental governance institution, Carruthers (2006) concludes that, although it is successful in information sharing and coordinating actions, to be an effective transboundary governance regime, the BCWECC needs to create a process for collaborative planning. Planning, in his view, is a policy driven approach that is "more sensitive to 'consumers' than 'producers' of public policy" (Carruthers 2006, 4). Collaborative planning produces governance derived from, and guided by, the participation of agents of political institutions, civil society and the market economy. Carruthers' point is that forms of environmental governance lack legitimacy if they are detached from the broader political, societal and economic context in which they exist.

Blatter's (2000) findings, in comparing European and North American environmental governance, confirm that transboundary environmental institutions need to be responsive to a broad array of societal interests to be effective. This would require that the BCWECC be more deeply institutionalized in the different subsystems of society (e.g., domestic political elites, business leaders, Native groups, etc.). Greater penetration of society is necessary to build legitimacy and also is strategically important for enlisting people and organizations with access to policy makers and community leaders. Finally, if the BCWECC is to evolve into a more effective transboundary governance regime, capable of shaping public policy and effective dispute resolution, it will need at least a measure of regulatory authority, perhaps modeled on the federal-level IJC, where buy-in is required from national governments.

STATE AND PROVINCIAL INTERGOVERNMENTAL AGREEMENTS

Intergovernmental agreements have sprung forth between states and provinces, many of them focusing on environmental issues not limited to border regions. Climate change, ocean spills, regional transportation, environmental technology, forest health management, emergency planning and clean energy are some of the focal points. These agreements have been important in signaling regional commitment to environmental and community agendas and programs, and to building support among political leaders and the mass public. Because of the centrality of the climate change agenda in states and provinces in the Pacific West, it is worth examining how this issue is related to regional transboundary environmental governance.

In the Pacific West and elsewhere, reduction of green house gases (GHG) is at the center of the climate change agenda embraced by states and provinces. British Columbia, perhaps the leader in this effort, enacted in 2008 what some touted as the greenest budget ever seen in North America (Hume 2008). The B.C. plan is based on using revenue from a carbon tax to provide incentives for people and businesses to become more energy efficient. The province goal is to reduce carbon emissions by 33 percent below 2007 levels by 2020. To achieve this goal, carbon taxes are to be combined with a cap and trade system and other initiatives.

British Columbia's aggressive actions to tackle climate change are part of a larger regional plan than extends to other Western states and provinces, and especially to California. In 2007, B.C. Premier Gordon Campbell and California Governor Arnold Schwarzenegger signed a memorandum of understanding to commit the state and province to work together in setting greenhouse gas reduction targets to reduce emissions by 2020 to 1990 levels or below. The reductions would be made "consistent with provincial and state policies," a caveat allowing jurisdictions room to change course for economic or other reasons (*www2.news.gov.bc.ca/news_releases_2005-2009/2007*).

The Western Climate Initiative (WCI) was launched in February 2007 by California, Oregon, Washington, New Mexico and Arizona as a partnership to enhance opportunities for co-operation to address climate change (Brownstein 2007). British Columbia joined the WCI in April 2007, and since then, two other Canadian provinces have joined. The WCI goal was to achieve a regional standard—utilizing cap and trade and other mechanisms—to meet greenhouse gas reductions tar-

gets. WCI member jurisdictions are attempting to meet the goals by prescribing California tailpipe standards, participating in a cross-border GHG registry, and working collaboratively on a regional cap and trade system to control GHG emissions. The incentive for joining the effort, in the case of British Columbia and Washington, as well as other WCI members, is to gain advantages of scale. Participation in a regional carbon market is expected to lower the costs to the regions' industries (*www.climateactionsecretariat.gov.bc.ca/En/fact_sheets/western_climate_initiative/*).

In addition to the economic benefits of scale, linking California and other Pacific states with British Columbia clearly would provide regional leverage vis-a-vis both countries' federal governments. Schwarzenegger said as much when he told reporters that he intended "to set an example that will both grab the imagination and inspire the rest of the continent" (Cernetig 2007).

By engaging in this form of intergovernmental collaboration, clusters of provinces and states are coalescing across borders in an attempt to increase their collective power to address regional, national and global issues which are not necessarily animated by the Canada-U.S. border. It appears that multiple jurisdictions working together, rather than complicating environmental issues, are likely to open new avenues for policy development. Although climate change is global in scale, and national in terms of Canadian and U.S. executive and legislative policy authority, the potential for regional action has been noted for years. Action at this level may be where political efforts can be most effective (Selin and Van Deever 2005). As Rabe (quoted in Selin and VanDeever 2005) notes, "it is at this level where energy production and transportation infrastructure is based and it is the level of government where regulatory tools are most focused."

Several cities are creating their own action plans and working closely with their respective states to enact supporting measures. Indeed, it is commonplace for universities and businesses to have climate change plans—which are now an important part of an organization's image and therefore its ability to attract students or customers.

As Selin and VanDeever (2005) report, transjurisdictional policy development focused on climate change has the potential to influence and shape national as well as international debates. Indeed, their research highlights the extensive cross-border network of civil servants, scientists, municipal officials, universities and businesses who are engaged in this effort. It is unclear what impact such coalitions will have on the shaping of future transboundary environmental governance. If nothing else, these political activities should enhance social learning and cross-border efforts to align policy agendas.

TRANSNATIONAL ENVIRONMENTAL POLITICS

Involvement of environmental NGOs is pervasive in the Pacific West where the region's political culture is especially marked by a sense of independence and a tradition of grassroots democracy (Papademetriou and Meyers 2001, 54). Transnational environmentalism involves NGOs as coalition-building, network-forming activists attempting to empower communities and influence economic and political behavior (Brooks and Fox 2004; Wapner 1995; Dobell and Neufeld 1994). Such groups are issue-based, comfortable working across borders and highly skilled in media strategies as well as litigation efforts. Transnational coalitions do not necessarily share ideologies and political cultures (Brooks and Fox 1998). NGO coalitions typically join environmental activists with epistemic communities composed of scientists, planners and academics. Such groupings are important in framing issues around ecological values (Keck and Sikkink 1998).

By achieving varying degrees of success in promoting their own goals, transnational actors have made substantial contributions to environmental governance overall. Using examples of recent controversies, we will discuss the strategies and effectiveness of key transnational organizations.

Rivers Without Borders and the Tulsequah Mine Debate

On the north coast, Rivers Without Borders (RWB), formerly Transboundary Watershed Alliance, is a membership-supported coalition that works strategically across the Canada-U.S. border. Its mission is to maintain and protect the diversity of species and habitat in

the transboundary watersheds of Canada and Southeast Alaska and to foster long-term conservation-based planning for the region's river systems (*riverswithoutborders.org/about-rwb/*). Its diverse 22-member binational coalition includes First Nations, labor groups, small communities and recreationalists, as well as conservation-oriented organizations. The coalition has a sophisticated networked communication system and regularly supplies the media with scientific information on targeted issues. RWB has multiple binational funding sources and its offices are located in the population centers of Vancouver and Seattle, as well as in Juneau, Alaska, and Whitehorse, Yukon.

Like that of most effective environmental NGOs, RWB's work is a mix of science and politics. For example, it worked with Craighead Environmental Research Institute in developing a Conservation Area Design for the Taku transboundary watershed based upon grizzly bear habitat, salmon and old growth forest as the primary data layers. (*www.grizzlybear.org/taku.htm*).

In recent years, RWB's most visible political effort has been against Redcorp Ventures' mining development situated on a B.C. tributary of the Taku River—considered to be southeast Alaska's most prolific salmon producer—about 50 miles upstream from Juneau, Alaska. The Tulsequah Chief mine, owned by Redcorp Ventures and closed since 1957 because of economic and accessibility problems, proposed reopening in 1994. The project was to be accessed by a 100-mile road through the watershed, a proposal since abandoned. A new re-opening plan, proposed in 2007, would alter the controversial earlier 1994 transportation plan by utilizing river hoverbarges instead of a road. Metal concentrates from the mine and equipment would be barged between Juneau, Alaska, and the mine, located on the Tulsequah River *(riverswithoutborders.org/2007*). Concerns about re-opening the mine focused on toxic chemical spills into the river system—a continuing problem since the 1950s—and the potential damage from barges to the watershed. Aboriginal rights are at issue because the Tlingit Nation's traditional territory includes the Taku watershed. However, Tlingit litigation before the B.C. Supreme Court to stop the development was unsuccessful (Kneen 2007).

As of early 2008, the mine permitting process was still being considered by numerous government agencies at the state, province and federal levels in both countries. In Alaska, the state Department of Natural Resources has permitting authority because the project does not touch federal lands. RWB has called for a binational environmental assessment of the project based on potential impacts on the economic and ecosystem values of the entire Taku watershed. Previous assessments by British Columbia and Canada focused narrowly on issues surrounding the project itself (*miningwatch.ca/index.php?/newsletter_24redfern_abandons_road*). The Tlingit Nation also insisted on a full environmental assessment.

Some have called for the IJC to broker a solution. Interestingly, both Alaska and British Columbia have opposed calling in the IJC fearing an environmentally-biased solution that could harm commercial interests (Lord 2004). British Columbia also made it clear that it does not support establishment of any IJC international watershed boards in the province (Report of the Canada-U.S. Interparliamentary Committee 2001). RWB continues to mount a high-profile, very public campaign against the project. It maintains a detailed monitoring system of the Taku and other issues affecting the watershed on its website.

The Tatshenshini International Campaign

In the 1980s, the Canadian mining company Geddes Resources, Ltd., proposed to build an open pit and underground mine at Windy Craggy Mountain in the northwest corner of British Columbia. The development was sited in a wilderness area surrounded by U.S. and Canadian parks—Kluane National Park, the Wrangell-St. Elias and Glacier Bay National Park and Preserve, and the Tongass National Forest in Alaska. The mine would be located in a vulnerable watershed on Tats Creek, about 25 miles upriver from the Tatshenshini River which joins with the Alsek River before flowing west through Alaska to the Pacific. The Tatshenshini ecosystem supports countless populations of wildlife, one of the continent's most productive salmon rivers and perhaps the most desirable white water rafting area in the world. The region is home to indigenous people, including the Yakutat and the Champagne-Aishihik First Nations.

In 1991, following two years of extensive organizing by a group called Tatshenshini Wild, Tatshenshini International, a coalition of more than 50 environmental NGOs including Native groups in Canada and the United States—with a membership totaling over 10 million people—was formed to fight the mine development (BC Spaces for Nature 2008). The coalition's goal was to make the Tatshenshini wilderness area, in

which the mine is located, a wilderness preserve. The Tatshenshini battle, a precursor to the later more publicized campaign to save the Clayoquot, involved an extensive international public information campaign aimed not only at the B.C., Canadian and U.S. governments, but at public opinion across the United States and globally to focus attention on possible destruction of two magnificent rivers (Hume 1992).

The high-profile public strategy led by Tatshenshini proved effective. After three years of trying, mine officials were unable to get the necessary permit approvals. In 1992, the issue was placed in the lap of B.C.'s land use planning entity, the Commission on Resources and the Environment (CORE), which decided that mining and preserving wilderness in the Tatshenshini were incompatible (Harrison 1996) and that the public benefits (including monetary) to the province of retaining wilderness outweighed benefits from mining (McDaniels 1999). In 1993, the B.C. government proposed to preserve the entire Tatshenshini-Alsek area as a park.

The political context in which the park decision was made was critical. The high-profile public strategy against the mine, directed by Tatshenshini International and aided by Canadian and U.S. politicians, was unprecedented (Careless 1997). In 1992, then Senator Albert Gore intervened in the campaign against the mine by enacting U.S. congressional legislation calling on the U.S. secretary of state to enter into agreements with Canada to protect the ecosystem. The direct involvement of Gore, who simultaneously pushed for world heritage site status for adjacent Glacier Bay National Park in the United States, was important in bringing international conservationist pressure to bear on the issue. The World Conservation Union and the United Nations Education, Scientific and Cultural Organization (UNESCO) urged British Columbia and Canada to apply to have the wilderness designated a world heritage sight. First Nations supported the designation, but only after receiving assurances that separate land claims would occur. U.N. heritage site status was achieved in 1994, which resulted in this triangular area of British Columbia, the Yukon and southeast Alaska becoming the largest world heritage site on earth.

Mobilization and Litigation: Teck Cominco

Teck Cominco Ltd. is a zinc and lead smelter located in Trail, British Columbia, 10 miles north of the U.S. border along the Columbia River. A dispute over downwind emissions from the smelter that damaged property on the U.S. side of the border resulted in the Trail Arbitration Settlement in 1941, which is considered the first international ruling on transboundary air pollution (Robinson-Dorn 2006). The IJC was instrumental in bringing the contending parties to arbitration. The settlement established the "polluter pays" principle in international law. The arbitration did not end the controversy as downwind farmers were dissatisfied with the settlement. More important, in addition to emitting air pollution, for a century (1894-1994) the smelter dumped slag, mercury, arsenic, lead and other pollutants into the Columbia River which flowed downstream into the United States.

The polluting of the northern Columbia River and Lake Roosevelt, the reservoir on the U.S. part of the river created by the Grand Coulee Dam, is the most recent chapter of environmental dispute involving the Trail smelter. Since smelting operations began at the Trail plant in the late 1800s, it is estimated that twelve million tons of slag have been deposited into the river (Roberts 2006). High levels of contamination in Lake Roosevelt and surrounding waters have for years raised health concerns for people and wildlife. In 1995, after pressure from the Canadian government, British Columbia and downstream agencies and residents in Washington State, the company stopped discharging into the river and offered to pay for remediation if pollutants found in the river were determined to be a risk to the health of humans or wildlife (Parrish 2005). Various scientific assessments were conducted. None were deemed to be determinative.

In 1999 the Colville Confederated Tribes, whose homeland abuts the reservoir, issued a formal petition to the U.S. Environmental Protection Agency (EPA) to intervene under U.S. federal Superfund authority. Superfund, which is the common name for the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), was passed by Congress in 1980 to allow the federal government to enforce the costly cleanup of hazardous waste sites identified by the EPA. The EPA inspected the upper Columbia-Lake Roosevelt area and found the very high levels of contamination qualified it for Superfund listing (Roberts 2006). In 2003 the EPA ordered Teck Cominco to conduct the studies required by the CERCLA. Teck Cominco refused to comply on the grounds that it did

not believe the EPA had jurisdiction over its Canadian operations. The Canadian government sided with the company and lodged a formal protest to the U.S. State Department claiming U.S. law does not apply extraterritorially in Canada. Canadians were greatly concerned about a precedent allowing transboundary liability cases against companies to be initiated in the other country (Roberts 2006). Canada also proposed sending the case to the IJC, a course of action not agreed upon by the United States.

With an impasse between EPA and the company, the Colville Tribes in 2004 launched a lawsuit under CERCLA's citizen suit provisions against Teck Cominco to force the company to comply with the EPA order. The unprecedented action was the first suit brought under CERCLA that attempted to apply the U.S. law extraterritorially against a Canadian corporation. The case was joined by Washington State. Teck Cominco, all the time insisting the issue should be solved through nonlegal bilateral means, filed a motion to dismiss the case, arguing that U.S. law does not apply to them. The case worked its way up to the 9th U.S. Circuit Court of Appeals, where the federal court ruled in Pakootas v. Teck Cominco Ltd. that the company was liable for a share of an estimated $1 billion to clean up Lake Roosevelt. In 2007 a voluntary agreement was reached between Teck Cominco and the EPA to study the extent and seriousness of the contamination.

Not withstanding this, the issue of cleanup was still outstanding. In 2007, citing potential negative impacts of the 9th Circuit Court's ruling on Canada-U.S. trade, Teck Cominco lawyers unsuccessfully attempted to get the U.S. Supreme Court to review the Circuit Court decision (High Court Declines to Review 2008). Of interest is the company's claim that Superfund Law does not apply to a Canadian company discharging hazardous wastes unless it "arranged" for the contamination to end up in the United States.

Although somewhat diminished by the legal context, key transnational actors and forces have been important in politicizing the dispute. The Teck Cominco plant, employing more than 4000 people in Canada alone (*www.techcominco.co/*), and one of the largest mining companies in the world, has always been the dominant economic force in the economy of Trail and the surrounding area. In the northern Columbia/Lake Roosevelt area, agriculture and more recently recreation have been significant economic activities. Several Tribes and First Nations share the transboundary area. Since the 1930s, local citizen groups have lobbied U.S. government officials to end pollution from the smelter. In 1989, the Lake Roosevelt Forum was formed as a multi-agency/stakeholder group to coordinate the work of the numerous state, federal and tribal entities that have jurisdiction over the lake. This was followed by the Lake Roosevelt Water Quality Council, which supports scientific studies of fish contamination throughout the watershed. Powerful transnational environmental NGOS, such as the Sierra Club USA, Sierra Club Canada and EarthJustice, filed amicus briefs on behalf of the Colville tribes' lawsuit. Likewise, multinational mining associations have aligned with Teck Cominco. The high level of citizen activism and corporate interest have made for a highly politicized context in which somewhat narrow notions of legal responsibility and diplomatic prerogatives have collided with broader environmental governance forces.

However this controversy plays out in the legal and diplomatic arenas, environmental governance is not likely to be advanced if the issues remain anchored in the legal context of Canada-U.S. relations. Even worse, the unilateral efforts by the United States to impose extraterritorial legal mandates will likely invite defensive and reciprocal political responses from Canada. The pollution issues stemming from Teck Cominco (and other industrial/urban activity both upstream and downstream from Trail) are now bound up with transboundary social, environmental and cultural issues endemic to the broader region. Thus, governance frameworks will need to incorporate the diverse needs and perspectives of transnational actors to achieve workable land, water and resource use decisions.

ANALYSIS AND CONCLUSIONS

Transboundary environmental governance in the Pacific West is characterized by a mix of institutions, processes and networks aimed at managing and resolving cross-border issues and building capacity to engage in collaborative actions across state and provincial jurisdictions. As the case studies show, environmental issues have been framed in different ways, reflecting different scales, interests and conceptions of natural and social systems. The role of national governments, once the key players in transboundary environmental governance, has lessened as subfederal-level political entities and NGOs have become key sources of mobilization, innovation and leadership. Today, the picture is one of multi-level, trans-scalar processes and flows emphasizing collaborative strategies and a strong role for NGOs.

Shifting beliefs about the relationship between the region's vast resource wealth and environmental well being have brought into question the readiness of conventional institutions to address contemporary challenges. This is especially true for national level instruments. Top-down legislative and judicial processes are problematic because contemporary environmental problems are as much about ecosystems and basins as they are about borders, and they increasingly touch on sensitive spatial and cultural issues and involve problems that no single government can control. Moreover, there is less willingness on the part of stakeholders to accept state control that is distant and generally oriented toward assigning blame rather than fostering protection (see Bratspies and Miller 2006).

So, how can we assess emerging institutions and their promise for transboundary environmental governance over time? A comprehensive assessment is not possible, but the case studies suggest several factors that appear to contribute to more effective institutions. First, analytical work on the effectiveness of international environmental organizations has brought attention to the importance of the "fit" between the problems at hand and the institutional and organizational responses to them (see Biermann and Bauer, 2004; Young 2001). The BCWECC, the major regional-level bilateral entity in the Pacific West, was a response to the problem of inadequate federal attention to critical cross-border environmental issues, and has provided a needed transboundary framework for policy coordination among civil servants and stakeholders. Cooperation is helped by spatial proximity of issues and actors within the Washington State-B.C. borderlands, which encourages personal relationships, networking and bureaucratic transparency. Such cross-border mid-level frameworks are needed to facilitate communication on overarching environmental stressors (particularly climate change) which are being addressed differently on both sides of the border. At a different level, recent strategic coalition-building among states and provinces focuses efforts at the level where there may be greater political will, and where policy capacity, regulatory tools and critical infrastructure are situated.

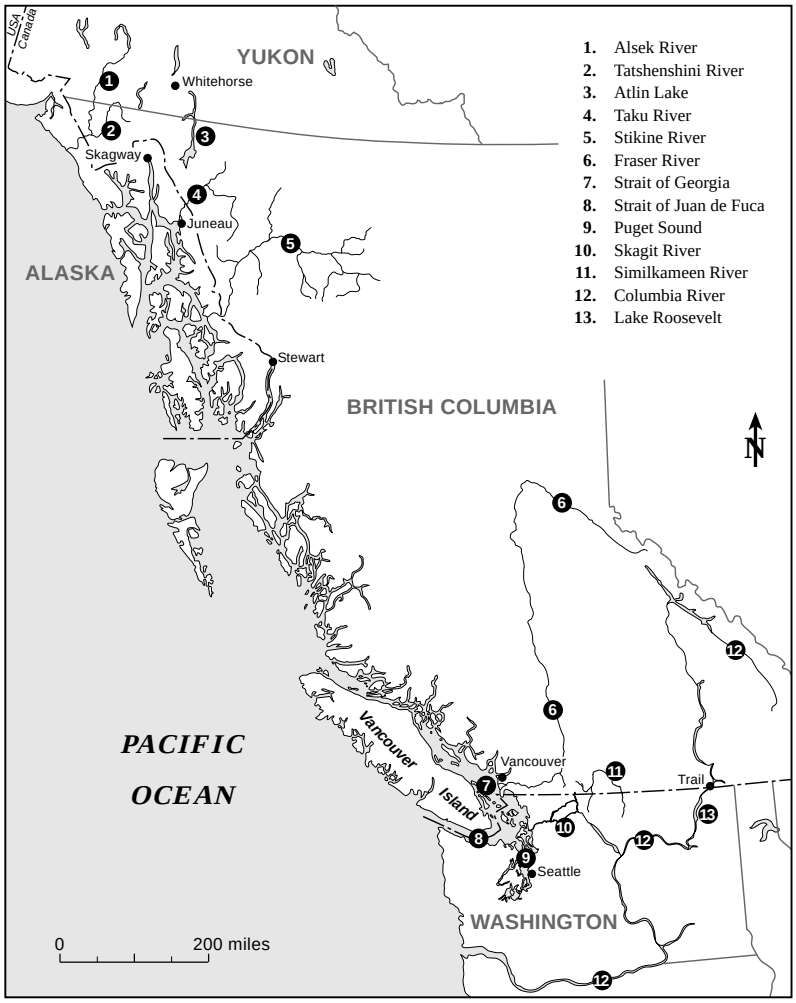
Second, inter-sectoral cooperation—that is, cooperation between political officials, citizens, economic and environmental groups—has been identified as a crucial element in developing capacity for regional policy making (Carruthers 2006; Bocher 2006; Millenium Ecosystem Assessment 2005; Blatter 2001). The failure of the Pacific Salmon and Columbia River treaty regimes to mobilize and sustain collaborative efforts across sectors is telling, and is the basis for reform efforts by disgruntled stakeholders. Carruthers' examination of the BCWECC reveals a similar weakness in the Council's inability to engage in a collaborative planning process. Interestingly, intersectoral cooperation may be most successful in the context of highly focused "place-based environmentalism," where saving a valley or watershed relies on mobilizing associations of activists, scientists, local officials and property owners. Effective campaigns like RWB and the Lake Roosevelt coalitions have used place as the basis for this kind of mobilization across sectors.

Third, the importance of leadership, and of individuals who are willing to "champion" the cause of promoting transboundary cooperation, cannot be overestimated. Although only touched on in this chapter, it is clear that the close personal and working relationships between different sets of B.C. premiers and Washington state governors have been crucial to elevating the profile of "transboundary" work. In the absence of such champions, transboundary efforts tend to languish due to the inherent lack of political and financial incentives for this kind of activity.

The high degree of environmental consciousness in the Pacific West, combined with a history of local and

regional innovation and strong leadership from governors and premiers, are likely to mean more experimentation with forms of environmental governance. The potential power of the climate change issue is enormous in terms of reframing and redirecting thinking about subsidiary issues such as ocean policy, forestry, wilderness, water and salmon. Meshing the somewhat grandiose policy agendas of state and provincial government leaders with the environmental and resource perspectives of local communities will be an enormous challenge. Without question, the transboundary institutions and processes of the future must be able to ensure effective coordination across jurisdictions and scales, while being responsive to the wealth of expertise, creativity and cultural experience that lies in communities throughout the Pacific West.

APPENDIX 9.1



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Chapter 10: Along the Domestic-Foreign Frontier: Québec and the Management of the St. Lawrence River Basin

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While a relative "latecomer" to the debate over how to protect the Great Lakes-St. Lawrence basin ecosystem, Québec, since joining the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement of 2005, has continued to define its role as a protector and defender. The author analyzes the motivation and impact of these developments from the standpoint of two possible incentives: interdependence and self identity on the international stage. The later motivation, international status, is explored against the background of the Gérin-Lajoie doctrine of 1965, which asserts that Québec has the power to conclude treaties in the areas where it enjoys exclusive authority. In recent decades, the doctrine has led to Québec's concluding some 550 international agreements. However, when it comes to water issues, Québec's leaders have signalled a growing acceptance of regional interdependence and seem more inclined towards a type of collaborative rather than competitive federalism. Given that Quebec wants to convey the image of an autonomous actor on the international scene, the authors speculate that the province sees regional cooperation as a means of harmonizing environmental policies without giving over that responsibility to the federal government. In this case of intertwined principles, the environment, as well as the province, can be seen as the beneficiary.

INTRODUCTION

Having signed the 2001 Great Lakes Charter Annex, along with Ontario and eight Great Lakes State Governors, Québec, on Dec. 13, 2005, joined the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement. In doing so, it pledged to act jointly in order to protect, conserve and restore these waters, to promote information exchange, and to prevent the negative impacts of water withdrawals. This implied the need to devise common norms and standards for the management of water in the basin, irrespective of the type of extractive activity or the location of the water.

What has been the nature and extent of Québec's engagement and how can it be explained? After recalling the context and describing the extent of Québec's regional cooperation on water issues, two explanations are considered: interdependence, i.e., those links that force the

Province to cooperate more closely with its neighbors, and identity, that is, Québec's desire to bypass Ottawa and assert its specific interests in certain issue areas. This first section also leads naturally to questions regarding the impact of this international engagement on domestic policy. For example, has Québec's participation in the 2005 Agreement triggered the adoption of new norms, or strengthened existing ones?

THE GEOGRAPHICAL, INSTITUTIONAL, AND HISTORICAL CONTEXT OF QUÉBEC'S INVOLVEMENT

A River at the Heart of Québec's Economy and Identity

The Great Lakes and St. Lawrence basin cover the five Great Lakes as well as the St. Lawrence River down to the city of Trois Rivières. This huge watershed includes 18 percent of the fresh water of the world, is home to 40 million people, has been the industrial heartland of the American Midwest as well as of Ontario and Québec, and represents 3,700 km of shipping lanes. The upper three-fifths of the length of the river constitute the Great Lakes (Giroux 1991) which contribute 80 percent of the flow of the St. Lawrence at Montréal (Québec 2002).

Québec holds three percent of the world's renewable fresh water (Québec 1999b) and Québec's economy is strongly tied to its water resources. For example, in 1997, hydroelectricity accounted for more than 96 percent of Québec's total electricity production (although much of this power comes from outside the basin). Shipping lanes offer a major trade advantage, and the environmental industry has more than 350 firms specializing in water issues, employing more than 6,000 people (ibid.). The St. Lawrence River accounts for 40 percent of Québec's renewable freshwater and provides drinking water to three million people in 100 municipalities (Québec 2002).

The river has been closely associated with Québec's identity ever since Champlain, Laviolette, and Maisonneuve sailed it to found Québec, Trois Rivières, and Montréal, respectively, in the early 17th century. This symbolic and economic importance is reflected in Québec's wishes to grant the St. Lawrence special status in its new water management policy so as to "recognize the importance of its intrinsic value for all Quebeckers" (Québec 2005: 39). One of the major challenges for Québec, therefore, is to protect its interests within the governance structure of the Great Lakes-St. Lawrence basin (Giroux 1991).

Expanding Regional Ties

Québec's cooperation with the Great Lakes states and with Ontario takes place in the larger context of Canada-United States cooperation governed by the International Joint Commission (IJC). Although it has played a certain role within the IJC over the years,[1] limited to providing technical expertise (Allee 1993), it is only since the signature of the Great Lakes Charter in 1985 that Québec has been involved more directly in the management of the basin. Domestically, water management is shared between the federal and provincial governments, a pragmatic arrangement that has produced a complex framework. It was only in 2002 that Québec adopted a water policy which led to the adoption of new principles and procedures that, in part, can be traced to subnational international agreements.

The International Dimension

The subnational agreements of 1985, 2001 and 2005

The Boundary Waters Treaty (BWT), which has been the foundation of the institutionalization of Great Lakes management between Canada and the United States, paved the way for numerous subnational initiatives. The provinces and border states are increasingly active in the management of natural resources and the environment (Allee 1993). At the end of the 1970s, the Great Lakes governors realized the potential threat of water diversion projects in favor of the dry states of the Southwest. They then decided, in consultation with the premiers of Ontario and Québec, to adopt the Great Lakes Charter which also "represents a unique bilateral effort to clean up the Great Lakes basin at the subnational level" (Sproule-Jones 2002, 44). This act of goodwill, signed on February 11, 1985, covers both ground and surface waters. At its core is a new obligation for the eight states[2] and two provinces to notify, consult and seek consent from one another regarding any project of diversion

or of consumption of large quantities of water from the Great Lakes Basin (Principle IV). This agreement marked the beginning of Québec's direct participation in the management of the Great Lakes (Francis 1989).

Further concerns regarding exportations of large quantities of water have led Québec, Ontario and the eight governors to sign the 2001 Annex to the Great Lakes Charter where they reaffirm their commitment to principles set in the Charter, and commit, as well, to develop and implement a new common, resource-based conservation standard. That standard will be applied to new water withdrawal proposals from the Great Lakes.[3]

Finally, the 2005 Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement implements the 2001 commitments which were developed after a series of public consultations. Its objectives include the promotion of an adaptive management approach to the conservation and management of the water resources, and cooperation on water withdrawals. The Agreement also creates the Great Lakes-St. Lawrence River Water Resources Regional Body with a broad mandate.

Québec's growing regional integration

The 1990s saw a significant increase in subnational regional environmental cooperation between the United States and Canada (VanNijnatten 2006). According to Munton and Kirton, there were more than 100 such links between provinces and states in 1995. "They interact via a multitude of collaborative agreements, working groups, and conferences that have emerged out of daily problem-solving" (ibid.).

Québec joined the Conference of New England Governors and Eastern Canadian Premiers upon its creation in 1973. As early as 1984, the Conference created a Committee on the Environment with the mandate to follow politically salient issues, such as acid rain, and develop a short-term regional plan for the reduction of CO_2 emissions (Rausch 1997). Québec participates actively in the Committee and in its three subcommittees on acid rain, mercury, and climate change. The Conference also encouraged significant cooperation in the areas of air quality, energy, and CO_2 emissions (ibid.).

In 1999, Québec and Ontario joined the Great Lakes Commission as associate members. Québec collaborates regularly with the Council of Great Lakes Governors of the same states, which the Québec and Ontario premiers joined as associate members in 1997. Québec has participated with observer status in some working groups of the Council. Currently, it is closely following the activities of the Aquatic Invasive Species Task Force concerned with preventing the introduction of alien invasive species into the Great Lakes and St. Lawrence basin.

Cooperation on issues pertaining to the Great Lakes and St. Lawrence basin reflects a more general trend toward greater transborder environmental cooperation (VanNijnatten 2004, 2006; Boardman 2006; Selin and VanDeveer 2006). Québec cooperates with its neighbors in several areas, notably pollution, water, and energy (Lubin 2003, 2004). It has signed agreements with all its Canadian and American neighbors, of which 11 are currently active.[4] The agreements cover transborder environmental impacts,[5] acid rain,[6] the Lake Memphrémagog watershed,[7] Lake Champlain,[8] phosphorus reduction in the Bay of Missisquoi,[9] the management of the Great Lakes-St. Lawrence basin, or are general in nature.[10] But what is the legal basis of such actions?

Québec's international legal status

In Canada, the allocation of authority between the federal and provincial governments over international matters follows no clear rules (Paquin 2006). The British North American Act of 1867 does not specify which body of the federation is responsible for external matters since these activities were then under the British crown (it was Britain, in the name of Canada, who signed the Boundary Waters Treaty in 1909). Only one clause, which some consider outmoded, entrusts the federal government with the capacity to implement treaties signed by Britain (Jacomy-Millette 1977).

In the absence of formal constitutional provisions, two perspectives, one federal, one provincial, have emerged. The first one does not recognize provinces' right to conclude real international agreements and argues that such agreements are only nonbinding administrative arrangements (Paquin 2006). However, as Dupré and Théroux (1989-90) have argued, the state is no longer the only subject of international law. Thus, while recognizing the supremacy of the federal government in external matters, Québec wishes to retain the capacity to initiate treaties where there is a legal basis for them. Moreover, since treaties are not directly enforceable in Canadian law, their implementation may require the approval of provinces in those areas where provinces enjoy exclu-

sive authority (Jacomy-Millette 1977), as with most environmental and resource matters. Indeed, Québec has claimed that it should be consulted and participate in the negotiation of international agreements that touch upon provincial powers.[11]

Québec invokes a constitutional dualism, which it sees as the foundation of the federation, to justify signing and implementing international agreements. The Gérin-Lajoie doctrine of 1965, which has governed official thinking in this area (regardless of the party in power), asserts that Québec has the power to conclude treaties in the areas where it enjoys exclusive authority. It can establish and pursue bilateral relations with other countries and international organizations and set up official representations in other countries (Paquin 2006). Accordingly, successive Québec governments have considered it their duty to claim the international extension of their spheres of authority (Turp 2006).

On the basis of the Gérin-Lajoie doctrine, Québec has adopted enabling legislation to support its international responsibilities. These laws cover agreements signed by Québec, Québec's participation in international forums and organizations, and agreements signed by Canada in areas where Québec has exclusive authority. The provincial minister of International Relations is responsible for negotiating and implementing international accords. Since 2002, any important international commitments undertaken by the Québec government must be submitted to the National Assembly, whether signed directly by Québec or requiring Québec's assent for its implementation on the basis that albeit signed by Canada, it involves Québec's spheres of authority. Consultation mechanisms with the provinces are often put in place in such cases to ensure that treaties stand a better chance of being implemented (Paquin 2006).

Québec has concluded more than 550 international agreements in the last few decades (Paquin 2006) and has more than 30 delegations, offices or local agents abroad (Québec 2006). The province is a member of the Organisation Internationale de la Francophonie. It also has taken part in the activities and conferences of the United Nations Educational, Scientific and Cultural Organization (UNESCO) ever since a May 2006 agreement established the position of permanent representative of Québec within the Canadian UNESCO delegation. Finally, Québec has given its assent to more than 30 agreements signed by Canada in its own spheres of constitutional authority (Turp 2006).

The Internal Dimension

Federal and provincial spheres of authority

The environment is a responsibility shared by Québec and Ottawa (Bédard 2004). Nevertheless, according to the 1867 Articles of the Confederation, provinces own their natural resources. Accordingly, the Federal government must recognize the supremacy of the provinces in water management (Allee 1993). Provinces have the right to pass laws regulating its use (Brandes 2005) and they hold primary responsibility for the resource (Loë & Kreutzwiser 2007). Yet, Québec also grants that "water is a complex reality that often falls under two jurisdictions" (Québec 1997, 22) and accepts Ottawa's involvement in research, particularly as it pertains to the St. Lawrence River.

Indeed, the two levels of government play different roles since water is also a strategic resource for the Canadian economy as a whole. Québec claims a leading role in the management of water in its territory, and takes responsibility for the protection of ecosystems and sources of drinking water. It is in charge of managing and regulating water flows, of granting user rights, and has the power to pass laws regarding water supply, pollution, and hydroelectric development. The Federal government, for its part, plays an important role in gathering and disseminating data, regulating toxic substances, promoting research and preventing pollution, with authority over oceans and fisheries, shipping, boundary waters, and water resources on land under federal jurisdiction. In general, however, since much authority is not formally allocated to one level or the other, redundancies are common and so is the number of laws, as is the case with laws pertaining to the St. Lawrence River.[12]

Québec's water policy

Québec's ample supply of water has long delayed the emergence of a provincial water policy. It was only in December 1997, against an international context of increasing concern for water issues, that a symposium on water management led to the first global picture of the use and management of water in Québec. Then, the government initiated public consultations which led to the establishment of a general framework for the future Québec water policy.[13]

The provincial water policy was made public in November 2002, with implementation entrusted to the Ministry of Sustainable Development, Environment, and

Parks (MDDEP). Its five major concerns are, water governance, the integrated management of the St. Lawrence River, aquatic ecosystems, water supply and quality services, and recreation. Furthermore, this policy identifies three important issues: the recognition that water is the common heritage of all Quebeckers, public health and protection of aquatic ecosystems, and integrated water management in a sustainable development context.

EXPLAINING QUÉBEC'S INVOLVEMENT IN REGIONAL WATER MANAGEMENT

How can we explain both Québec's desire to play an active role in regional water management issues under the Great Lakes and St. Lawrence agreements and the nature of its involvement? Two explanations readily spring to mind: interdependence, where a growing sense of collective regional interests has incented Québec to cooperate more closely with its neighbors, and identity, which reflects Québec's desire, in certain areas, to bypass Ottawa and assert its specific interests on the international stage.

Interdependence

The evolution of the international system towards globalization and the crisis of the state have encouraged subnational units to play a more active international role in issue areas that affect their interests or, in the case of Canada, that lie within their exclusive authority (Duchacek 1990; Lachapelle & Paquin 2004b). The concept of "paradiplomacy,"[14] which refers to the diplomatic activities of subnational entities, appears in the literature in the 1980s in reference to the international activities of members of the Canadian and American federations (Paquin 2004). Duchacek (1990) identifies three types of paradiplomacy: transborder, transregional, and global paradiplomacy. The first type, of greater interest here, is conditioned by geography and similarities in the nature of the problems and available solutions. It is directly linked to increased interdependence and to the formal and informal transborder interactions that grow ever denser and lead to a greater sense of a common destiny (Dehousse 1991).

If this approach were useful to explain Québec's international involvement in the management of the St. Lawrence-Great Lakes, one should be able to show that at least several of the following statements are not contradicted by evidence:

- The effectiveness of Québec's water policy regarding the St. Lawrence watershed depends on cooperation with its neighbors;
- Transborder networks have led to the emergence of cooperation in issue areas pertaining to the management of water and to the creation of transborder coalitions in the water issue area;
- Québec's involvement is a response to perceived external threats to the management of its water resources and to the development of its domestic policy.

Is the effectiveness of Québec's policy dependent on cooperation with regional actors?

If interdependence were significant as an explanation for Québec's involvement, this would mean that decision makers are conscious of Québec's ecological interdependence and believe that successful water management depends on cooperation with other regional actors for environmental reasons (ecological interdependence). It would also mean that the province should be concerned with avoiding an interprovincial and transborder race to the bottom.

Ecologically, Québec lies downstream from a common watershed as well as downstream from air pollution from the Midwest. Québec borders four American states. Ecological interdependence enhances actors' sensitivity and vulnerability and is an incentive to cooperate. Indeed, the adoption by the IJC of an ecosystem perspective in the 1970s is the direct consequence of this interdependence. The importance of international cooperation in the face of increased economic interdependence was expressed by Québec's minister for International Relations in 1991: "Managing this growing interdependence is a most stimulating challenge. . . . Our industrial development, our scientific potential, our

cultural dynamism, as well as our social development are linked to our capacity to conclude alliances, ensure collaborations, and offer exchanges to the advantage of each" (Québec 1991, VIII- IX). Furthermore, the need for cooperation with régional actors was also expressed in Québec's 2002 Water Policy:

> *The interdependence of the St. Lawrence River and the Great Lakes calls for increased participation by Québec within the international agencies active in managing these bodies of water. . . .The quantity and quality of Québec's waters depend in part on external factors. The most obvious example is the St. Lawrence River, downstream from the Great Lakes. The levels and flows, as well as water quality, of the St. Lawrence are significantly affected by natural phenomena and by human decisions made upstream (Québec 2002, 30)*

According to Harrison (2006), although we know little about the nature of interprovincial interdependence, it can lead to a race to the bottom, where provinces might be tempted to weaken their norms in order to keep or attract new investments. However, when there is popular support in favor of a particular policy (and support for water management is strong in Québec), provinces are less vulnerable to interprovincial competition (ibid.). Moreover, the federal government may intervene and try to harmonize standards in order to defuse such competition. According to Olewiler (2006), environmental norms are relatively stable in Canada, which means that evidence for a negative or positive competition is weak. But when demands for strengthened regulation are high, one can observe increased competition that leads to stronger legislation; then, little by little, policies move toward greater harmonization.

Rather than a race to the bottom, evidence points in the other direction. Watershed management has long been in place in Ontario, whereas it was only in 2002 that Québec formally implemented its new water policy based on that approach. There is thus greater evidence of a race to the top. Incidents involving not only public health, but also water allocation, heightened public sensitivities and led to new legislation and regulations in Ontario, Saskatchewan and Nova Scotia (Loë and Kreutzwiser 2007). Many provinces revised their policy following those incidents; they include Nova Scotia, Québec, Alberta, Manitoba, Saskatchewan, and Ontario. The adoption of tougher norms is directly linked to heightened public concern which leads to races to the top, with convergence being explained by similar domestic pressures on policymakers.

Have transborder networks led to cooperation in issue areas pertaining to management of water?

An interdependence approach would also portend the development of new networks of cooperation on water issues arising out of the existing networks in other issue areas, or the creation of transborder networks and coalitions specifically concerned with water issues.

Sustained transborder cooperation started in the 1960s, with the transportation, power, natural resources and tourism sectors. States and provinces set up transborder structures in order to promote their common interests and exchange information (Lubin 2003-2004). This cooperation has evolved to the point where New England governors and Eastern Premiers do not even consider the other side of the border to be really "foreign" (Duchacek 1984).[15] Further, "with the opening of borders to trade and investment, regions that are becoming more economically integrated with one another also are more likely to share transjurisdictional pollution problems" (VanNijnatten 2004, 655). In 2005, the American market absorbed 80 percent of Québec's annual exports, accounting for one-third of Québec's gross domestic product (GDP), and because two-thirds of that trade was with the New England and Midwestern states (ENAP 2006), one could easily infer that economic integration lay the ground for stronger environmental cooperation.

Many organizations on both sides of the border work to protect the watershed or advance the interests of water users. Without more extensive research, it is difficult to show a causal relation between their activism and Québec's involvement, but it would equally be hard to deny that they created a context that facilitated such an involvement. Organizations with strong Québec links will help illustrate this web of interdependence. For example, Coalition Eau Secours! has played an important role in fostering public concern and pressuring the government to defend and strengthen the 2005 agreement. And there are additional noteworthy transborder cooperation networks, including. Great Lakes United, an international coalition dedicated to preserving and restoring the Great Lakes and the St. Lawrence River ecosystem, and the International Association of Great Lakes and St. Lawrence Mayors, established in the late

1980s by the St. Lawrence Economic Development Council. The association meets annually to make recommendations on the protection, promotion, and economic development of the Great Lakes-St. Lawrence system. Its members are Canadian and American municipalities, as well as public and private organizations from both sides of the border. Its objectives are to give mayors an opportunity to discover, support and promote their common interests, contribute to raising awareness of their common and precious environment, and develop a common strategy to protect and improve the resource.

Is Québec's involvement a response to perceived external threats to the management of its water resources?

If interdependence were a useful explanation of Québec's involvement, one should find evidence that Québec has signed agreements in order to protect the St. Lawrence watershed from external threats, such as water exports and transfers.

Concerns over the security of the supply of water began in the 1960s in the United States (Lasserre 2005). The growing need for water in the upper Midwest, in the West, and in the Southwest, as well as new water diversion projects, have been perceived as threatening the control that Great Lakes provinces and states exert over their own resources. Even though water transfers already take place in each country, there are yet to be massive transborder transfers in North America (ibid.). Free trade agreements in 1989 and 1994 raised new concerns over water exports from the region.

Ambiguities about the status of water in trade agreements have raised concerns with citizens and non-governmental organizations (NGOs) eager to prevent large alterations to basin water systems, such as dams, large withdrawals, erosion control projects, flow control structures, and diversions of water from the basin (Elwell 2001). The Eau Secours! coalition was created in response to fears about the privatization of Montreal city water in 1996, as well as the suggestion made during a 1996 provincial Summit on the Economy and Employment that Québec water could be exported in bulk.[16] These fears have led to a legal debate over the status of water as a commercial or public good (Lasserre 2005). Trade agreements give no clear answer. Whatever the legal case, what is important here is the conviction, largely shared, that threats exists and that provinces (in the case of bulk water exports) or provinces and states, in the case of derivations, have to guard against them.

The debate over water exports reached a new height in 1998, when the Ontario government issued a permit to Nova Group to export annually a maximum of 600 millions of liters of water from Lake Superior for the Asian market. The U.S. House of Representatives reacted very quickly, with Representative Bart Stupak (D-Michigan), submitting a resolution (H. Res. 566) on 20 October 1998 calling on the President and the Senate "to prevent the sale or diversion of Great Lakes water to foreign countries, businesses, corporations, and individuals until procedures are established to guarantee that any such sale or diversion is fully negotiated and approved by representatives of the United States Government and the Government of Canada, in consultation with any Great Lakes State or Province that could be impacted by such a sale or diversion."[17]

These renewed concerns over massive water exports gave new life to subnational talks to prevent them (Elwell 2001). In 1999, the New England Governors and Eastern Canadian Premiers adopted a declaration affirming their willingness to implement new criteria for managing water withdrawals. This led to an amendment to the U.S. Water Resources Development Act (art. 1962d-20) that prohibits "any diversions of Great Lakes water by any State, Federal agency, or private entity for use outside the Great Lakes basin unless such diversion is approved by the Governor of each of the Great Lake States" (Lasserre 2007, 158-159). Similarly, the 2001 Great Lakes Charter Annex and the 2005 Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement outline similar principles concerning water withdrawals in the Great Lakes (ibid.).

In connection with the revised 2005 Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement, both Québec's premier and the Environment and Sustainable Development minister have emphasized the need to protect Québec's long-term access to quality water in sufficient quantity, and that one concern was to adopt new and more restrictive rules regarding water diversion outside the watershed.[18] Indeed, given its downstream position, Québec will be affected by the cumulative impacts of all upstream water diversion and consumption projects.[19] The minister specifically pointed to the need to control water diversions and exports, during the ratification debate in Québec's National Assembly in November 2006.[20]

Identity

Rather than interdependence, Québec's active involvement in regional matters might be rooted in its long-standing desire to assert its specificity and autonomy within (and sometimes outside) the Canadian federation. Thus, Québec's involvement would be explained by the twin desires to reorder domestic relations with Ottawa and build an international political legitimacy, along with the gradual development of a new national role conception.

Does Québec's involvement stem from a desire to compensate for an imbalance in the federal-provincial relationship?

To what extent can Québec's participation in the Great Lakes Charter and related agreements, as well as in the Great Lakes Commission, be viewed as a means of reordering internal political relations, vertically with the Federal government, and horizontally with other provinces? Or, to use Kincaid's words (1990, 54-55), is Québec's diplomacy "the product of long-standing grievances and desires for autonomy"? If so, the St. Lawrence, because of its economic and cultural importance, might be an excellent means of promoting these concerns.

In the water issue area, we may be witnessing the rise of a new kind of collaborative federalism whereby no level of government is subordinate to the other (Watts 2003; Cameron and Simeon 2002). Indeed, many elements support the picture of a collaborative rather than competitive federalism[21] in water issues, with Québec's regional involvement providing a needed dimension that builds upon federal policy. The federal government itself has favored cooperative solutions on water issues (Saunders and Wenig 2007).

The first review of the implementation of the agreement on the integrated management of water resources states that "because Canada is a federation, it is essential that all jurisdictions collaborate to address water issues and challenges" (Government of Canada 2005, 2). Ottawa also recognizes the existence and the legitimacy of relations between two provinces and several states regarding the management of the Great Lakes (Canada, 2005, 3). The Canadian Council of Ministers of the Environment, which has developed an indicator of quality in order to harmonize how various governments communicate information about water quality, is a good example of vertical and horizontal collaborative federalism (Government of Canada, 2005). At the provincial level, Québec and Ottawa collaborate in the management of the St. Lawrence. Several coordination mechanisms have been set up since 1989, such as the St. Lawrence action plan (1988-1993), Vision 2000 (1993-1998 and 1998-2003), and St. Lawrence Plan for a Sustainable Development 2005-2010. Yet tensions do exist. The Canadian federal government is keen to develop a national approach to water issues in order, among other concerns, to promote coherence between and among national and subnational policies and to show that Canada is united behind certain policy options. On the other hand, such an approach, if too heavy-handed, as was the case in many areas after the 1995 Québec referendum on independence, runs the risk of encouraging nationalistic feelings in Québec. Tensions over the allocation of responsibilities in the management of water arose between Québec and Ottawa in 1999, when the latter called for the implementation of a pan-Canadian strategy to prevent water diversion from Canadian watersheds (Johansen 2007).[22] Québec rejected the proposed agreement on the grounds that it represented an intrusion of the federal government into provincial matters and because it wished to retain the capacity to export water, which it considered a national resource (Lasserre 2005). Québec, however, subsequently prohibited bulk water transfers in December 2001 (Law 58), still without signing the proposed federal agreement. In a way, then, one could argue that for Québec, regional cooperation is a means of harmonizing policies without giving over that responsibility to the Federal government.

International water policy as a means to build international legitimacy

Since international relations are traditionally the prerogative of sovereign nations, the symbolic and political nature of the international activities of subnational units is high. In this regard, international relations have assumed considerable importance for Québec, which wants to communicate the image of an autonomous actor on the international scene (Feldman and Feldman Gardner 1984). International relations are a means to gain external recognition, and, in the process, help reinforce a domestic sense of identity (Lachapelle & Paquin 2004b). The greater the nationalistic feelings, the greater the attempts to develop external relations (Paquin 2004). As a matter of fact, Québec has developed rituals akin to the signature of interstate treaties (Dehousse 1991).

In the context of its 2002 water policy, Québec reiter-

ated its wish to be a full participant in the international debates on water and to be associated with the federal government in relevant international discussions, thus enabling the province to strengthen its links with other federations (Québec 2002). Generally, Québec uses international agreements to assert its right and capacity to sign agreements in its spheres of authority,[23] also one of the formal objectives of the 2005 Great Lakes Agreement,[24] and to strengthen economic cooperation with the eight states of the Great Lakes–St. Lawrence watershed.[25]

There are differences between the respective approaches of the Liberal (PLQ) and Québécois (PQ) parties on this issue. The latter has favored a unilateral approach based on *faits accomplis*, whereas the former prefers a more concerted approach, all the while reaffirming the need for Québec to assert its interests within and outside the Federation.[26] Naturally, the PQ would go all the way and claim the sovereign right to sign international treaties on behalf of Québec rather than merely the right to approve agreements that will have to be ratified by Canada to be valid under international law. Yet, both parties share similar concerns regarding the essence of Québec's international role. Even though the PQ has been more active, Liberal governments have pursued a similar international strategy, and which party is in power does not seem to be significantly correlated with the number of environmental agreements signed.

Using water to assert a specific role

This explanation is linked to the previous one, insofar as conflicts with the federal government largely stem from the desire to protect or assert national identity. But role conceptions can have both a domestic (identity and capacity) and external (status) origin (Le Prestre 1997). "A role reflects a claim on the international system, a recognition by international actors, and a conception of national identity" (Idem, 5). Thus, if this explanation were promising, we should observe both sustained expectations from the system, i.e., regional actors, for Québec to assume a proactive role and participate in regional arrangements, and also a growing presence of the theme of water management and protection in the official foreign policy platforms of parties and governments.

The previous remarks regarding the importance of Québec's identity issues also support identity as the root of Québec's role conception. Regarding the external origin of Québec's role, although this source remains plausible, current research has not yet been able to show significant expectations from other regional actors in the water issue area that would indicate it played a determinative role.

> "Québec uses international agreements to assert its right and capacity to sign agreements in its spheres of authority... and to strengthen economic cooperation with the eight states of the Great Lakes – St. Lawrence watershed.

Increasing references to water issues in the official foreign policy platforms of the parties and of governments could support the perspective that role conception has much to do with Québec's regional engagement. Yet, although Québec's 2006 international policy framework asserts that it has international responsibilities with respect to natural resources, and that water is one of the major issues of the 21st century, only two paragraphs, devoid of concrete actions, are devoted to water in over 128 pages (MRI, 2006b). Whereas water was of major importance in the eyes of the preceding PQ government when it adopted its 2002 water policy, water no longer features prominently in the minds of political parties as far as foreign affairs are concerned. None of them, in their 2007 political platforms, makes reference to the international dimensions of water.[27] Thus, it remains unclear whether there exists today a stronger sense of collective regional destiny on these matters. When Minister for Sustainable Development Thomas Mulcair announced a second round of public consultations on the revised agreement, he emphasized that this project would ensure Québec would have a voice and an effective role in the management of Great Lakes waters.[28] Indeed, it may very well be that Québec, joined the 2005 agreement mainly for reasons linked to interdependence issues, which enabled it to articulate a new role for itself at the regional level, based on status and congruent with its identity aspirations.

DOMESTIC IMPACTS

A second avenue of inquiry looks at Québec's participation in the 2001 Annex and in the 2005 accord from an environmental perspective and examines how this process has inserted new norms into the domestic process or strengthened existing ones. In other words, are Québec laws stronger because of its international involvement? Only brief remarks will be offered.

The 2001 Annex seeks to establish guidelines for water withdrawals based on such principles as compensation for water losses and minimal impact on water quantity or quality. Rather than reflecting the lowest common denominator, the 2005 Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement contains novel features that may serve to solidify or even pull domestic policies upwards, including concepts such as sustainable development, the precautionary principle, public participation, adaptive management, and regulatory flexibility.

Québec's water policy, adopted as late as 2002, is based on seven principles: (i) the "public good" nature of water; (ii) the need for a common engagement in favor of its protection, restoration, and improvement; (iii) the precautionary principle; (iv) access to drinking water at a reasonable cost; (v) the user-payer and polluter-payer principles; (vi) the integrated and sustainable management of the resource with a concern for effectiveness, equity, and transparency; and (vii) the collection and dissemination of information on the state of the resource. The Government of Québec undertook to adopt criteria for water withdrawals and watercourse diversions (Québec 2002). It also declared that it would, upon completion of the 2005 agreement negotiations, evaluate the possibility of adapting these new criteria to its entire territory, taking into account the hydrological characteristics and location of each drainage basin, as well as regional disparities (ibid.).

To implement the policy as well as the 2005 agreement, the government, in June 2008, introduced legislation "asserting the collective nature of water resources and aiming at strengthening their protection."[29] The legislation reaffirms principles already present in the 2002 policy and in the 2005 agreement (polluter/user-pays, precautionary, prevention, reparation), while clarifying the legal status of the resource, whether surface or underground. It would also considerably tighten the requirements for water withdrawals for all watersheds, except in the case of the St. Lawrence, which a specific section of the bill addresses. This section also follows the 2005 agreement by prohibiting bulk water transfers and further regulating existing or new withdrawals.

With adoption of this bill into law, the Annex 2001 and the 2005 agreement will have directly inserted new norms into the domestic process and strengthened the existing policy. Indirectely, therefore, these agreements have also probably helped Québec overcome domestic political coalitions opposed to such extensive measures, although details are lacking.

CONCLUSION

Québec came relatively late to the Great Lakes-St. Lawrence scene. The adoption of an ecosystem perspective by the IJC in the 1970s did not trigger much movement in Québec, but growing ecological and economic interdependence and identity politics combined to push Québec toward adopting a more active regional position in a range of environmental matters.

From an interdependence perspective, although the provinces may be concerned with avoiding an interprovincial and transborder race to the bottom, there is, in Canada, greater evidence of a race to the top in the water area. Québec also has signed agreements in order to protect the St. Lawrence watershed from external threats such as water exports and transfers. Furthermore, the growing web of interdependence, fueled by economic integration, may have also laid the ground for stronger environmental cooperation.

Regarding identity, Québec's involvement could be explained by the desire to reorder domestic relations with Ottawa and to build international political legitimacy, both associated with the gradual development of a new national role conception. Even if it is by joining the agreement that Québec developed a role, rather than

the other way around, this explanation is still worthy of note. On the matter of internal political relations, although many elements support the picture of a collaborative rather than competitive federalism in water issues, tensions remain over the allocation of responsibilities in the management of water between Québec and Ottawa. In addition, since one of the expressed objectives of the Agreement is to assert Québec's right and capacity to sign agreements in its sphere of authority, Québec's desire to build an international political legitimacy through such means is clear.

Thus, these two explanations are obviously complementary, although greater precision of the dependent variable would help differentiate their respective explanatory power. Interdependence seems a somewhat stronger explanation since its helps explain both the nature and contents of Québec's regional involvement, whereas identity only may explain the propensity toward involvement or, when instrumentalized, help gain domestic support for it. The lack of references to the international dimensions of Québec's water issues contradicts the idea of a stronger sense of collective regional destiny. There is no evidence of an attempt to redefine Québec's identity in regional terms: Québec and its partners remain two distinct entities. Yet evidence of perceived interdependence also remains limited in the absence of extensive content analysis of official speeches. Finally, the last section of the paper suggests that Québec's participation in the 2005 agreement might have triggered the adoption of new norms. Many provisions of the 2008 water bill follow directly from the 2005 agreement whose impacts will be felt throughout Québec's territory, and not only in the St. Lawrence basin; proof again that, under some conditions, interdependence can help rather than hinder the state's quest for domestic autonomy.

NOTES

1. Members of the Commission's council do not officially represent their government or organization, but there is almost always a commissioner from Québec in the IJC, however. Other Québec civil servants are members of the Great Lakes Water Quality Board and the International St. Lawrence River Board. Finally, several Quebeckers from civil society can be found in study groups, such as the International Lake Ontario-St Lawrence River Study Board.

2. Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin

3. The governors and premiers put forward the following directives to further the principles of the charter: develop a new set of binding agreement(s), develop a broad-based public participation program, establish a new decision making standard, review project under the Water Resources Development Act of 1986, §1109, 42 U.S.C. §1962d- 20 (1986) (amended 2000), develop a decision support system that ensures the best available information, and coordinate the implementation and monitoring of the charter and this annex.

4. Personal communication, 2007.

5. "Agreement between Québec and New Brunswick concerning Transboundary Environmental Impacts," signed Nov.13, 2001. "Agreement between Government du Québec and Government of the State of Maine concerning Transboundary Environmental Impacts," signed Aug. 27, 2001. "Agreement between Government du Québec and Government of the State of New Hamsphire concerning Transboundary Environmental Impacts," signed Aug. 27, 2001.

6. "The Canada-Wide Acid Rain Strategy for Post-2000," signed on October 19, 1998.

7. "Cooperation Agreement on Managing Lake Memphremagog and its Watershed between the Government of Québec and the Government of the State Vermont," signed on December 4, 2003; "Protocole complémentaire entre le Québec et le Vermont et portant sur les modalités conjointes d'intervention en matière d'urgence environnementale-Lac Memphrémagog," signed Feb. 11, 2007.

8. "Vermont–New York–Québec Environmental Cooperation Agreement on the Management of Lake Champlain," signed July 2, 2003.

9. "Agreement between the Gouvernement du Québec and the Government of the State of Vermont concerning Phosphorus Reduction in Missisquoi Bay," signed Aug.26, 2002.

10. "Entente de coopération en matière d'environnement entre le gouvernement de l'État de New York et le gouvernement du Québec," signed May 10, 1993.

11. Art. 7 of the "Loi sur l'exercice des droits fondamentaux et des prérogatives du peuple québécois et de l'État de Québec," adopted in December. 2000 (Gouvernement du Québec 2006).

12. The physical dimensions of the St. Lawrence, the great diversity of its constituting elements and its multiple

uses present major challenges to the development of a coherent legal regime for its environmental management (Giroux 1991). Shared constitutional powers create a highly complex situation. According to the 1867 Act of Confederation, the St. Lawrence is part of Québec's public domain, with two exceptions: what had already been the responsibility of the Federal government, such as the ports of Montréal, Trois-Rivières and Québec, and what was subsequently acquired or improved by the federal government (Gouvernement du Québec 1999). Moreover, art. 919 of Québec's civil code specifies that Québec owns the riverbed up to the high water line, unless it has been conceded to the federal government (Gouvernement du Québec 1997).

13. A process coordinated by the Bureau d'audiences publiques sur l'environnement, a unique feature of Québec's environmental policy. The mission of the Bureau is to inform and consult the public on questions related to the quality of the environment assigned to it by the minister of Sustainable Development, Environment and Parks. In so doing, it helps guide government decision making in a sustainable development perspective, a perspective comprising the biophysical, social and economic aspects.

14. Some authors, however, such as Brian Hocking (1994), question this concept on the grounds that diplomacy is a system and cannot be segmented.

15. Heavy economic migration from Québec to the New England States in the 19th and early 20th centuries no doubt reinforced this feeling.

16. See: *http://www.eausecours.org/public/zindex.htm*.

17. According to Glass (2003), although Section 1109 of the Water Resources Development Act of 1986 already "requires that any plan to remove water from the Great Lakes basin proceed only with the unanimous consent of the governors of all eight Great Lakes states," its dim prospects for enforcement have rendered the statute an ineffective tool for protecting Great Lakes water.

18. See: *http://www.mri.gouv.qc.ca/fr/informer/salle_de_presse/communiques/textes/2005/2005_06_30.asp; http://www.mri.gouv.qc.ca/fr/informer/salle_de_presse/communiques/textes/2005/2005_12_14.asp*

19. Stratégie Saint-Laurent ; *http://www.strategiessl.qc.ca/strate.fra.html*

20. see: *http://www.mri.gouv.qc.ca/fr/informer/salle_de_presse/communiques/textes/2006/2006_11_30.asp*

21. Defined as a process by which national goals are achieved by the federal government acting alone or by the federal government shaping provincial behaviour through the exercise of its spending power.

22. The Strategy has three components : (i) changes in the law implementing the Boundary Waters Treaty, (ii) a joint Canadian-American request for the IJC to study the consequences of water diversion, consumption, and withdrawals, and, finally, a panCanadian agreement on water withdrawals.

23. At the signing of the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement*, Premier Charest, declared that "such an agreement confirms Québec's ability to negotiate and conclude international agreements on issues that come under its jurisdiction" (*http://www.mri.gouv.qc.ca/fr/informer/salle_de_presse/communiques/textes/2005/2005_12_14.asp).*

24. One of the objectives of the agreement is clearly to "retain State and Provincial authority within the Basin under appropriate arrangements for intergovernmental cooperation and consultation." (*Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement* 2005, Chapter 1, Article 100).

25. As Québec's minister for International Relations has stated, this agreement "is also an opportunity for Québec to strengthen cooperative initiatives with the eight Great Lakes states and Ontario, which are important partners for Québec" (*http://www.mri.gouv.qc.ca/fr/informer/salle_de_presse/communiques/textes/2005/2005_12_14.asp).*

26. See Premier Charest's remarks in the 2006 policy, "La force de l'action concertée," (Observatoire de l'administration publique – ENAP 2006).

27. The Liberal manifesto only promises to promote responsible (i.e,. less wasteful) uses. Similarly, the PQ manifesto grants little space to water, while the ADQ 2007 manifesto makes a few references to water but avoids its regional character.

28. See: *http://www.mri.gouv.qc.ca/fr/informer/salle_de_presse/communiques/textes/2005/2005_06_30.asp*

29. Our translation

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Chapter 11: Renewable Electricity and Canada-U.S. Cross-border Developments

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Increased use of renewable resources is part of a broader agenda being pursued in U.S.-Canadian transboundary areas, an agenda that also includes such topics as boundary waters management and efforts to mitigate climate change. "Renewable energy" is defined as electricity derived from wind, solar, biomass and hydroelectric resources. In many transboundary areas, these policies are being pushed forward by sub-national (state, provincial, regional and local) governments and energy consortia, as well as nongovernmental organizations. The links between both countries on this issue—both institutionally and physically—are discussed, as well as ways in which increased international cooperation could push forward the renewable electricity agenda. A case study focuses on the shared renewable electricity interface that has developed between New Brunswick and Maine.

INTRODUCTION

The purpose of this chapter is to investigate the ways in which efforts to promote the increased use of renewable electricity in either Canada or the United States have been affected by transnational actors, institutions and structures.

Traditionally, any consideration of binational issues regarding electricity (that is, issues involving some combination of Canadian and U.S. actors, institutions or structures) has tended to concentrate upon reliability, or the way in which power provision is guaranteed or secured. Indeed, the North American Electric Reliability Council, a binational organization with the mission to "ensure the realiability of the bulk power system in North America," dates back to 1968 (NERC 2008; see, also, Gattinger 2005). During the past few years, however, that primary focus upon reliability has been challenged. Issues of the security of supply continue to be important in binational deliberations, both in terms of the short term (i.e., the blackout in the northeastern United States and Ontario in 2003) and the longer term (i.e., the discussions regarding the construction of large electricity supply systems in Canada in order to meet demands in the U.S. market). But the debate has widened to consider the issues of environment and sustainability. Within this book, there are other chapters devoted to examining issues that are

part of this emerging agenda. Climate change is a prime example (see Rabe, this volume).

This chapter focuses upon another part, increased use of 'renewable resources' (however defined) to meet the demand for electricity services. We look at the ways in which discussions surrounding the increased use of, for example, wind, solar, biomass and hydroelectric resources, in both Canada and the United States have been affected by transnational actors, institutions and structures.

While it is generally (though not universally) accepted that the increased use of renewable electricity is an important step in efforts to move towards a sustainable electricity system, it is by no means the only focus. There are ways in which "conventional" plants' atmospheric emissions (e.g., sulfur pollutants from coal-fired power stations) can be reduced and that clearly would have transboundary implications. Additionally, if the focus of sustainable electricity systems were about the provision of "electricity services" rather than, say, "electrons," then issues of efficiency and conservation issues would play a role as might lobbying other countries for deployment of appliance standards. Indeed, further widening the consideration of "electricity services" to simply "energy services" would draw attention to the way in which fuel switching could also play a role; for example, a particular goal might be better reached (however that may be defined) by natural gas rather than electricity.

Nevertheless, the issue of renewable electricity is certainly worthy of attention. The sustainability of electricity systems around the world (including those in Canada and the United States) has been called into question. A transition to a more sustainable energy future—which will inevitably include an increased use of renewable electricity—is vital. At the same time, international governance is evolving, with a much broader range of actors involved in efforts to promote mutually-beneficial outcomes among countries. Consequently, it is now appropriate to examine the ways in which different kinds of activity are affecting this debate in Canada and the United States, and to evaluate the relative value of the different contributions to that same debate.

The chapter proceeds in five main parts. Following this introduction, the context is set in the next section by highlighting key elements of the electricity supply systems in Canada and the United States as well as policy strategies being developed in both to promote the increased use of renewable electricity. The links between the countries on this issue—both institutionally and physically—are also introduced, and the ways in which increased international cooperation could push forward the renewable electricity agenda are highlighted. The third section of this chapter presents a detailed case study regarding the ways in which efforts to promote the increased use of renewable electricity in either country have been affected by transnational actors, institutions and structures. A brief fourth section identifies other cross-border developments that are worthy of note. The final section identifies other cross-border developments of relevance before reflecting upon the lessons for governance systems, more broadly. Suggestions for future work conclude the chapter.

SETTING THE CONTEXT

To give context to the subsequent discussion in this chapter, we provide a brief introduction to electricity issues in this section. More specifically, we examine the structure of electricity systems in both Canada and the United States, with a particular emphasis upon the present contribution of renewable resources to each country's supply portfolio. The consequent prospects for sustainability of these systems is then reflected upon. Current efforts to advance the supply of renewable electricity—through explicit policy strategies in each country—are then reviewed.

Moving from each of these two countries individually, to the interactions between them, we highlight current U.S.-Canadian electricity exchanges and refer to the array of transborder organizations that are concerned with this issue. Focusing more specifically upon the issue of renewable electricity, the potential importance of Canada-United States cooperation on the issue is discussed and then, in the subsequent section, explored in a case study. Canada and the United States are both substantial producers and consumers of electricity. According to International Energy Agency (IEA) figures for 2005, the United States ranked first in terms of national production, accounting for 23.4 per-

cent of the global value, and Canada ranked sixth with 3.4 percent of the global value (IEA, 2007, 27). These respective shares are disproportionately large relative to each country's population, as revealed by per capita consumption figures. For the world, that value is 2,596 kilowatt hours per capita (kWh/capita) and for countries of the Organization for Economic Cooperation and Development, 8,365 kWh/capita; the United States, 13,640 kWh/capita; and Canada, 17,307 kWh/capita (2005 data, IEA, 2007, 49, 51 and 57). Having established that the two countries are substantial electricity producers and consumers, we now turn to examine the United States and Canada separately to consider the components of that supply.

First, consider Canada. IEA figures reveal that in 2005, almost 58 percent of the electricity generated in Canada originated from hydropower facilities (the vast majority of them of the "large-scale" variety), while coal provided almost 17 percent and nuclear almost 15 percent of that total. Other resources played a relatively modest role: natural gas just under 6 percent, oil about 3 percent, and biomass approximately 1.5 percent. No other resource contributed more than 0.25 percent (IEA, 2008a). There are, however, significant differences among provinces, with some dominated by hydropower and others by fossil fuels. For example, in British Columbia, Québec, Newfoundland and Labrador and Manitoba, more than 94 percent of the electricity derives from hydropower, whereas fossil fuels supply 93 percent of the electricity supply in Alberta and 75 percent in Saskatchewan. Other provinces have a more balanced supply portfolio (2005 data from Statistics Canada, 2008a).

Depending upon how "renewable" is defined—and this is often contested (Patterson and Rowlands, 2002)—Canada can be considered already to have significant renewable resources in its supply portfolio. Note, in particular, the hydropower figure cited above. But if one restricts the category to the so-called "new renewables," which are often defined as "low-impact renewable resources," e.g., solar, wind, small hydro and biomass (Rowlands and Patterson, 2002), then the contribution of renewables to the supply portfolio across Canada is much more modest. Of the hydropower noted above, only a small portion would be included in this "new" category, and a similar observation could be made about the aforementioned "biomass" category, i.e., only some of it is generated in a "sustainable" manner. In addition,

Table 11.1: Percentage Contribution from the Electricity Generating Sector to Total National Emissions*

Pollutant	Canada	United States
Sulfur dioxide	20%	69%
Nitrogen oxides	11%	22%
Mercury	25%	40%
Carbon dioxide	22%	39%

* *Contribution to total national emissions from all stationary, area, mobile and other human-related sources*
Source: Miller and Van Atten (2004), p. 1.

wind supplied approximately 0.23 percent of Canadian electricity production in 2005, tidal approximately 0.005 percent and solar photovoltaics approximately 0.003 percent (IEA, 2008a).

Turning to the United States, the same IEA database reveals that, in 2005, 50 percent of U.S. electricity production was from coal-powered facilities, 19 percent from nuclear power, and just over 18 percent from natural gas. The other resources that played a secondary role were hydropower (6.8 percent), oil (3.3 percent) and biomass (1.1 percent) (IEA, 2008b). As with its neighbor to the north, however, there are significant differences across the country and it is possible to find individual states which have their electricity supply portfolios dominated by coal (for example, West Virginia, with 98 percent of all electricity generated by this resource), nuclear power (Vermont with 72 percent), natural gas (Rhode Island with 97 percent), hydropower (Washington State with 76 percent) and petroleum products (Hawaii with 78 percent) (2006 data, EIA, 2007).

Similar to the discussion about Canada above, the reference to "renewable" electricity sources in the United States, specifically in terms of hydropower and biomass, would have to be adjusted downward if they were to be further categorized as "new" and/or "sustainable" sources. Additionally, wind supplied 0.42 percent of U.S. electricity production in 2005, geothermal 0.39 percent, solar thermal 0.014 percent and solar-PV 0.0004 percent (IEA, 2008b).

To complete the list, "waste," which is --sometimes included in the "green", or renewable/sustainable power category, accounted for 0.53 percent of electricity pro-

duction in the United States in 2005 and 0.003 percent in Canada (IEA, 2008b; IEA, 2008a).

The sustainability consequences of electricity systems are wide ranging. Most significant, perhaps, are the atmospheric consequences. In both Canada and the United States, the operation of the power sector is a key determinant of air quality, and this is particularly the case in the United States (not surprising, given the dominance of coal in that country). Table 11.1 provides details. Thus, though the issue covered in this chapter—electricity—is not strictly an "environmental" issue, it is a key determinant of environmental prospects.

Such environmental interests have helped to motivate interest in renewable electricity, although, as noted in this chapter, there are often other motivators also in play. Indeed, a range of particular policies to support the increased use of renewable electricity in electricity supply systems have arisen around the world, particularly in OECD countries including the United States and Canada (REN21, 2008).

Before reflecting upon such efforts, two points are worth making. First, most of the policy activity in the United States and Canada has been driven by subnational (usually state or provincial) governments. This has been encouraged by both physical and political phenomena. With respect to physical attributes, significant losses occur when electricity is transported long distances. Smaller geographic areas have thus been encouraged to develop their own supply options. As for political considerations, the desire for energy security also encourages local communities to push for self generation. Additionally, the nature of federalism, particularly in Canada, and the fact that national governments in both countries have shown relatively little interest in pursuing government intervention and environmental action have further served to push subnational governments to the forefront of electricity issues.

Renewable Electricity Resources

In both Canada and the United States, the renewable portfolio standard (RPS) traditionally has been and continues to be the most popular means of advancing renewable electricity. This policy encourages reliance on renewable resources by obliging market participants to ensure that a predetermined share of their total electricity supply is provided by qualifying (i.e., renewable electricity) facilities. This "predetermined share" may gradually ramp up over time. All electricity generators may fulfill this obligation through the use of some kind of tradable renewable energy certificates (REN21, 2008).

Developments in U.S. renewable electricity

The United States has been identified as the "birthplace" of the RPS, with discussions in California during the mid-1990s introducing the concept to the debate (Rader and Norgaard, 1996). During the past decade, it has increased in popularity (Wiser et al, 2007)—so much so that, by the middle of 2008, 25 states and the District of Columbia had implemented mandatory RPS policies in markets that collectively account for 46 percent of nationwide retail electricity sales (Wiser and Barbose, 2008, 1).

RPS policies have served to stimulate significant developments in wind energy, in particular. Increasingly, there has been a recognized need to reserve a portion of the RPS for solar energy and/or distributed generation, accommodated through so-called "carve-outs" (Wiser and Barbose, 2008, 1). As the issue evolves, there are debate concerning the cost effectiveness of RPS, implementing RPS policies in light of transmission constraints, and the links to slowly-evolving federal action on the issue which, to date, has been dominated by the federal tax credit.

Developments in Canadian renewable electricity

In Canada, the level and extent of renewable electricity provision have been more modest. This is perhaps not surprising, given the fact that hydropower dominates the supply portfolio at the national level. Nevertheless, there has been some policy action; similar to the United States, the RPS (though sometimes under different names and different guises) predominates. However, the extent and pace of electricity industry restructuring—particularly with respect to the introduction of competition into heretofore monopoly markets—has lagged behind that in the United States. As a result, what is often called in Canada an "RPS" by its proponents is perhaps more accurately referred to as a "utility procurement for green power" policy (Rowlands, forthcoming-a). In any case, something resembling an RPS, with a set target, "ramping up" over time, and at least one utility having to procure that amount of renewable electricity, exists in New Brunswick, Nova Scotia and Prince Edward Island (Lipp, 2007).

While the RPS predominates, another approach, one that is traditionally associated with European efforts

Table 11.2: Cross-border Electricity Exchanges Between Canada and the United States, 2007*

Canadian electricity exports to the United States			US electricity exports to Canada		
Source	**Destination**	**Amount (MWh)**	**Source**	**Destination**	**Amount (MWh)**
Manitoba	ND/Minn	9,860,933	Washington	BC	6,330,050
Ontario	New York	7,415,852	Michigan	Ontario	2,887,447
Québec	New England	6,897,117	Minnesota	Ontario	2,812,087
Québec	New York	6,815,050	New York	Québec	2,149,560
BC	California	4,618,468	New England	Québec	1,202,946
BC	Washington	3,402,811			
Québec	Vermont	2,199,576			
Ontario	Michigan	1,681,802			
NB	Maine	1,462,576			
BC	Oregon	1,440,369			
Manitoba	Minnesota	1,202,176			

* *Exchanges of at least 1,000,000 MWh.*
Source: National Energy Board (2008).

to advance renewable electricity (Rowlands, 2005), appears to be gaining ground in parts of North America. Commonly called a "feed-in tariff, this approach, in its most basic form, is a payment—usually at a premium compared with the market price for "conventional" electricity—to renewable electricity facilities for every unit of electricity generated, guaranteed for a number of years, by a contract between the generator and some public and/or utility authority. Payment levels may be differentiated by technology, or even by facility location (REN21, 2008). In Canada, the Province of Ontario announced, in March 2006, that it would pursue a feed-in tariff or, in its language, a "standard offer contract." This development broke the virtual monopoly that the RPS had on the policy discourse (Rowlands, 2007). Consideration of feed-in tariffs in other provinces, as well as a number of states (Rickerson et al, 2008), has followed.

U.S.-Canadian Electricity Connectedness

We now look at the energy connections between the United States and Canada. Currently there are a number of organizations examining shared energy issues between the two countries. As already noted in this chapter's introduction, NERC exists to promote reliability. Its work is further supported by a number of regional organizations, three of which have operations that span the Canada-U.S. boundary (e.g, the Western Electricity Coordinating Council, the Mid-Continent Area Power Pool and the Northeast Power Coordinating Council).

Additionally, Canada and the United States explore electricity issues in a range of international fora involving other countries. Continentally, they include the Commission for Environmental Cooperation of North America, the North American Energy Working Group, and, more broadly, the International Energy Agency. Globally, the group includes the Commission on Sustainable Development and the work associated with gatherings like the Washington International Renewable Energy Conference that took place in Washington, DC, March 2008.

Physically, there are a number of electrical interconnections between the two countries. And although the total amount of electricity exports and imports remains relatively small compared to the total amount of electricity generated in each country, the absolute values

can still be significant, particularly for the border states and provinces involved. In 2005, about 7 percent of Canada's electricity was exported to the United States and a much smaller relative share went the other way (IEA, 2007, 27)). Table 11.2 provides more information and details where among their 8,000 km border Canada exported energy to the United States and vice versa.

The Rationale for Cross-border Cooperation

To conclude this section, it is useful to identify reasons why there is emerging interest in cross-border cooperation on renewable electricity issues. This helps to set the stage for a case study that follows in the subsequent section. For one thing—and this applies to electricity irrespective of its resource origin—when electricity provision is considered over a larger, rather than smaller, area, and consideration is paid to both sides of the international border, this situation can lead to better operation of the entire system. The improvement may be realized in terms of increased reliability or lower prices, or both. For example, interconnection may allow a power plant on one side of the border to play a role following an outage on the other side. Similarly, it may allow a power plant in an area with low seasonal demand to meet demand in an area with high seasonal demand. Or there may be instances in which the situation could be reversed, and required capacity in both areas could be lower than it otherwise would have to be.

Second, and turning to renewables explicitly this time, attention to a geographically larger area might increase the attractiveness of renewable electricity by potentially increasing its "firmness" in terms of dispatch. With increased geographical reach, such as when generation facilities are spread out across space (Milborrow, 2007), the variability of renewables tends to be muted. Similarly, the ability to draw upon a larger area means that a "solar-rich area" (with, for example, strong summer production) may be able to be linked with a "wind-rich area" (with, for example, strong winter production) so that a more temporally-constant supply results. To see how these possibilities might translate into reality, we now move to our case study.[1]

CASE STUDY OF SHARED ELECTRICITYINITIATIVES: NEW BRUNSWICK AND MAINE

Our in-depth case study examines relations between the Canadian province of New Brunswick and the state of Maine, and is set within the broader context of interactions among Maritime provinces and New England states. We briefly examine the respective power resources on each side of New Brunswick-Maine international border, then review the institutional context, analyzing the regional governance arrangements on electricity issues that have evolved during the past quarter-century. The focus then turns specifically to the bilateral relationship and investigating recent aspects of and future prospects for relations between New Brunswick and Maine. With a population of approximately 750,000 inhabitants (2007 data from Statistics Canada, 2008b), New Brunswick generates electricity by means of petroleum products (42 percent of all generation in the province), nuclear power (22 percent), coal (15 percent), hydropower (15 percent) and natural gas (6 percent) (figures are for 2004 and are taken from NRCan, 2006). In 2004, 12 percent of the electricity generated in the province was exported to the United States (namely, Maine), and another 11 percent to other Canadian provinces (NRCan, 2006; NEB, 2005). Important to note, as well, is that New Brunswick is a winter-peaking system, and sits beside Québec (a large hydropower producer) and Nova Scotia (a province with a fossil fuel-dominated generation portfolio) (NRCan, 2006).

Maine, meanwhile, has a population of just over 1.3 million inhabitants (2007 data from U.S. Census Bureau, 2008) and its electricity demand is met by a portfolio of in-state power plants as well as imports. The former include natural gas (meeting 32 percent of total demand), biomass (29 percent), hydropower (22 percent), petroleum products (6 percent) and coal (2 percent); imports from Canada satisfy the remaining 9 percent (figures are for 2005 and are taken from EIA, 2008).[2] Regionally, Maine is part of the New England-Independent System Operator (NE-ISO), which is a summer-peaking system that, collectively, has significant reliance upon natural gas as a generating fuel (ISO-NE, 2008).

The Regional Context

Useful for our analysis is a brief review of the regional organizational context in which the formal administrative discussions between New Brunswick and Maine have taken place,[3] followed by an investigation of the particular provincial-state relationship that exists and continues to develop.

The Conference of New England Governors and the Eastern Canadian Premiers (hereafter referred to as "the Conference") was established in 1973. Consisting of the leaders of six states (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont) and five provinces (New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island and Québec), the group has included, as key parts of its agenda, both environmental and energy issues. Indeed, a "Northeast International Committee on Energy" (NICE) was formed in 1978 in order to "monitor and act upon common energy issues in the New England-Eastern Canadian region," and energy had been a major concern of the governors and premiers since the establishment of the Conference (Conference, 2008).

Not surprisingly, interest in energy issues at this regional level has largely followed what has happened at the global level. During the oil crises of the 1970s and early 1980s, for example, energy was a major focus, with renewable energy occupying the agenda as well. "Tidal power" was often mentioned during this period, as well as the occasional reference to solar and wind power. By 1983, however, the level of attention accorded either "renewable energy," or even "energy" broadly, had fallen significantly. By the following year, renewable energy appeared to have disappeared from the agenda altogether. This, as mentioned above, follows global trends, including dramatic declines in the world price of oil and thus reduced economic incentive to pursue renewable energy, or to explore energy strategies at all. (Conference, 2008).

Changes in the electricity scene in the United States in the early 1990s, however, encouraged the reemergence of energy as an agenda item. In 1995, one of the tasks of the Conference was to "assess the changing energy marketplace" (Conference, 2008). This was sparked by the increasing level of attention being paid to electricity industry restructuring on the continent at that time. In the United States, the Energy Policy Act of 1992 gave the Federal Energy Regulatory Commission (FERC) authority to monitor transmission systems and promote competition (Watkiss and Smith, 1993). Indeed, New England was one of the pioneers in this new area, and the ISO New England—one of the first independent electricity system operators in the United States—was created by FERC in 1997 (Bushnell and Saravia, 2002).

Not much attention was paid to "renewable electricity" during this period, with one exception worth highlighting. Interestingly, it effectively served to foreshadow further debate, not only in this part of the continent, but elsewhere too. Specifically, in July 2000, the Conference directed NICE to "adopt a letter to then-Secretary Richardson of the U.S. Department of Energy (DOE) recommending that the U.S. DOE work with the NICE and states and provinces to maintain an open North American energy market and clarify the treatment of largescale hydro-electric power under federal restructuring legislation." It is further noted that NICE was willing "to work with the DOE on developing renewable programs for any federal restructuring proposal" (NICE, n.d.).

In 2001, the Conference adopted the Climate Change Action Plan. With respect to the electricity sector, this plan established the goal of reducing the amount of carbon dioxide emitted per unit of electricity use within the region by 20 percent of then-current emission levels. While this is not explicitly tied to renewable electricity, and nuclear power proponents, for example, would argue it has a key role to play, carbon dioxide emission remains a key point in the discussion (Conference, 2008).

Following this, the level of attention accorded renewable energy continued to be high. In 2002, leaders pledged "to investigate new and renewable energy technologies and market opportunities." In 2005, the Conference published a draft strategy for promoting renewable energy and energy efficiency, as well, and, at the annual meeting the following year, the NICE presented its report entitled "Recommendations for Promoting Energy Efficiency and Renewable Energy in the Northeast". In October 2006, Prince Edward Island hosted an "energy dialogue" focusing on "renewable power promotion"—a forum that was held under the aegis of the Conference, and fewer than six months later (11-12 February 2007), there was a Ministerial Forum on Energy and Environment in Québec City where "promoting the development of renewable energy" was part of the agenda (Conference, 2008).

Notwithstanding these good intentions—as articulated in declarations and studies of various kinds—it

remains that the actions of individual provinces and states within the Atlantic and New England regions have not served to operationalize the inspirational words expressed in regional fora. Instead, renewable electricity actions in Atlantic Canada and New England have been primarily driven by provincial- and state-level priorities. We explore this further by considering each of the two countries in turn.

Atlantic Canada provinces

Three of the five provinces in Eastern Canada have an RPS, but at least two of them have some qualifications that serve to prioritize local resources. (Québec and Newfoundland and Labrador are the exceptions.)[4] In Nova Scotia, the RPS target is 5 percent by 2010 and 10 percent by 2013. This has to be satisfied, however, by resources located within the province's borders. In New Brunswick, meanwhile, the RPS goal gradually increases: from 1 percent in 2007 to 10 percent in 2016. Although there is no explicit geographical requirement for the renewable electricity generating facilities, there is the need for them to be EcoLogo certified (TerraChoice Environmental Marketing Inc., 2008), and given that this is a Canadian-based certification system, it is a significant qualifier. In Prince Edward Island, the RPS goal is 15 percent by 2010, yet there is a broad interpretation regarding what kinds of systems qualify both in terms of resources and location.

Although Québec does not have an RPS, it has had a series of "requests for proposals" as it aims to develop its wind industry. There is, moreover, a particular geographic criterion that must be satisfied. More specifically, in accordance with a Québec government regulation, all the winning bids must ensure that at least 60 percent of the total cost of each wind farm was incurred in Québec, and that at least 30 percent of the cost of the wind turbines must be incurred in the regional county municipality of Matane and the administrative region of Gaspésie–Îles-de-la-Madeleine.

New England states

Turning to the United States, we see that five of the six states in the region have an RPS in place. The sixth state, Vermont, had a "standard," but now has a "goal."[5] Amongst the various differences regarding the details of each state's RPS, it is worth noting the variations with respect to what resources qualify for inclusion. Hydropower, for example, is treated differently by the various states. In the terms of Maine's RPS, any hydropower facility with a nameplate capacity under 100 MW qualifies for inclusion. Other states, however, have different limits: for Rhode Island, the equivalent number is 30 MW; for Connecticut, it is 5 MW. The state of Massachusetts does not allow any hydropower to qualify under the terms of its RPS. While state-level resource endowment affects the decision as to where to "cut off" hydropower, the presence of significant largescale hydropower resources north of the international border—and the possibility that their role in meeting the goals of an RPS could stifle indigenous development of renewables—may have a part to play as well.

A second observed difference has to do with where the renewable resource can be located in order to qualify for inclusion in the RPS. For many of the states, its location within the borders of New England is preferable (and, for Connecticut, neighboring states as well), because often the local development of renewable energy can bring with it a variety of economic and social benefits. Additionally, if the qualifying electricity comes from outside of the region, there are concerns that, first, the auditing challenges associated with electricity transmission may mean that the electrons cannot be guaranteed to have been "sourced" from that particular renewable electricity generator; and, second, if the import of out-of-state electricity simply serves to increase environmentally-damaging electricity generation in that neighbouring jurisdiction (because the "green power" is being exported), then the particular goals of the RPS may not have been advanced.

In response to such concerns, legislation associated with a number of New England states' RPSs has been designed to protect against extraterritorial contributions. ISO-NE is playing a lead role in these efforts and arrangements have been established to track the source of electricity generation, then determine whether it meets the requirements of the particular RPS (ISO-NE, 2008).

Thus, notwithstanding the regional aspirations that have been articulated across Eastern and Atlantic Canada, as well as New England, subregional policies continue to be heavily influenced by local priorities. Against this background, we now turn our attention to the more specific New Brunswick-Maine relationship.

The New Brunswick-Maine Example

New Brunswick and Maine have a number of historical economic and social links. Additionally, they have long-

standing electrical links,[6] and have recently been working to augment them. New Brunswick Premier Shawn Graham and Maine Governor John E. Baldacci released a report on electricity cooperation following from the "Memorandum of Understanding between the Province of New Brunswick and the State of Maine to Enhance the Mutual Benefits of the Maine/New Brunswick Electrical Interconnections" or MOU, an agreement signed in Bangor, Maine on 9 February 2007. While focusing on more than just renewable electricity, that MOU noted, in its preamble, that "The northeastern United States needs new supplies of electrical energy, including renewables" (Maine, 2007). A report of Phase I was released in June 2007 (New Brunswick/Maine, n.d.), with the Phase II report scheduled to investigate the feasibility and challenges of specific collaborative approaches (Maine, 2007).

Both jurisdictions would seem to benefit from greater electricity interaction. New Brunswick, for its part, would like to increase its development of renewable electricity—and, indeed, all electricity, given its interest in nuclear power—and has significant potential (NBSO, 2007, p. 11) for supplying the northeastern United States with low- or no-carbon electricity.[7] That could be helpful given that New England states not only have renewable electricity obligations (as noted above in the discussion regarding RPSs), but the emerging regime known as the Regional Greenhouse Gas Initiative (RGGI) obliges these states to reduce carbon dioxide emissions as well (RGGI 2008).

On its part, the state of Maine has its own motivations. It has had a not-entirely-harmonious relationship with its New England power partners. While it is endowed with a lot of relatively low-priced hydropower, the state of Maine feels that it has had to "pay for" the consumption of higher-priced natural gas by its neighbours to the south—in particular, in the densely-populated areas of Massachusetts. Records from 31 March 2008, for example, reveal that New England had the highest power prices in the entire United States (Riner, 2008). The discontent with the status quo has been made public—a spokesman for the Maine Public Utilities Commission reportedly said, "We have not made a secret of our displeasure of some of [the New England Power Pool's] cost allocations and governance structure" (quoted in *World Gas Intelligence*, 2008). Reports investigating alternatives have been published (Riner, 2008) and one of these alternatives involves merging with the New Brunswick system.

> "...legislation associated with a number of New England states' RPSs has been designed to protect against extraterritorial contributions... subregional policies continue to be heavily influenced by local priorities.

Nevertheless, there is still some friction between the two jurisdictions with regard to renewable electricity policy. For one, there are those in Maine who are hesitant to have others contribute to the state's renewable energy goals. Indeed, as Maine developed its own RPS, it placed emphasis upon "steel in the ground [in Maine]," clearly looking for the economic benefits from indigenous development of renewable resources (Maine, 2005).[8] Moreover, legislators and the representatives of the Maine Public Utilities Commission continue to highlight "job creation and economic development" as reasons to promote renewable electricity (Ravana, 2008).

But discussions between New Brunswick and Maine continue, and they could produce a key and potentially path-forging model for international relations on renewable electricity. Already critical ingredients appear to be in place and these include historical links, complementary needs, diverse resources and synergetic ambitions. While they are not the only bilateral links currently in play across the Canada-U.S. border (the next section briefly identifies a number of other ones), they are clearly ones that are worth monitoring.

OTHER CROSS-BORDER DEVELOPMENTS

A full investigation of other cross-border developments on renewable electricity is beyond the scope of a single chapter. Nevertheless, we highlight three additional bilateral relationships that are of interest. Each is briefly described; then we return to those examples, drawing upon particularly revealing characteristics, in the conclusions of this chapter.

In the middle of the North American continent, Manitoba and the states to its south have solid links on electricity issues. Indeed, the fact that Manitoba Hydro is a member of the Midwest Independent Transmission System Operators is identified by some as a model for cross-border cooperation (New Brunswick/Maine, n.d., Appendix B, pp. 11-15). This is not to suggest that the international relationship has been entirely harmonious. Disputes between Manitoba and Minnesota, regarding the latter's export of hydropower to the former have certainly occurred (Bradley, 2004). However, as noted, there are institutional links. Manitoba's participation in the Midwest Renewable Energy Trading System (M-RETS) and the Midwestern Greenhouse Gas Reduction Accord are two specific examples that are relevant to our investigation.

Moving west from this part of the international border, Alberta and Montana also have had discussions regarding renewable electricity. Though not as advanced as their neighbours to the east (nor, as we report below, their neighbours to the west), regulatory approvals for the major electricity interface were received in 2008 (MATL, 2008). These were designed, at least to some extent, to address Alberta's heavy reliance upon fossil fuels. In fact, this project could well be the first of many that serves to help unlock the substantial wind power potential that exists in the Midwest of the continent (AWEA, n.d.).

Completing our travels in a westerly direction, we next briefly consider the Pacific Coast. In the northern part of this region (British Columbia, Washington and Oregon), there are significant hydropower resources, whereas in the southern part, not only is there significant demand (e.g., California), but also a supply system that is highly dependent upon fossil fuels, particularly natural gas. A number of formal organizations have been exploring possibilities for cross-border cooperation on this issue, including the Western Governors Association, which has led to the Western Renewable Energy Generation Information System. In addition, the personalities of the leaders involved, particularly California Governor Arnold Schwarzenegger, have played a key role to date.

CONCLUSIONS: REFLECTIONS ON THE ROLE OF EMERGING GOVERNANCE SYSTEMS

In this chapter, we have reflected upon a number of cross-border developments regarding renewable electricity; one we have identified in depth, others mentioned in brief. Of course, given the length of the border between the United States and Canada, there are other cases that could also be identified and examined. Indeed, the province of Ontario—with its large population, high degree of economic activity, and electricity interconnections with multiple states—has also been at the center of a range of issues. Nevertheless, we have tried to provide some insight into how these issues are unfolding, and could continue to unfold.

In light of broader discussions about cross-border environmental governance that are undertaken in this book, we emphasize the fact that it is still the very early days of renewable electricity and shared electricity governance. With climate change and air quality issues rising to a higher place on the agenda, with the cost of conventional energy sources increasing, with more attention being paid the economic development "spin-offs" that often accompany locally-sourced energy and with the security of energy supply becoming a key concern in light of global geopolitical developments, the prospects for renewable electricity are attracting an unprecedented level of attention. But action, to date, has been modest.

Furthermore, what activity there has been on this issue has primarily taken the form of "soft law,"—that is, declarations of intent. While there is some "hard law" to draw from—particularly the legislation that has been developed at the subnational level within provinces and states—that to date remains a patchwork of approaches. Even within regions of Canada and the United States,

let alone across the international border, disparate policies coexist. There is no evidence of strict policy coordination and little evidence of what could be construed as "hard law" to assist in these cross-border efforts to reach energy sustainability.

There is perhaps one exception worth noting, the various "reliability councils" that operate in Canada and the United States. With actions spanning the border, these councils have traditionally set policy on electricity issues with the goal of keeping the lights on. As interest in renewable electricity increases, these groups have begun to investigate aspects of this issue, for example, the reliability of wind power in large, international areas. The councils may prove to be among the first providers of "harder" transborder electricity policy.

Such speculation encourages us to consider the extent to which we would expect to see future policy driven by elected officials and their appointees, as opposed to policy professionals who gain authority through expertise and retain some degree of independence from the political process and that of governance. Given both how complex electricity systems are, as well as how "closed" they traditionally have been (that is, consumers have not traditionally had many decisions to make about electricity consumption and thus have not become particularly educated about it), professionals—including those engineers whose job it is to run the electricity systems, coupled with the respective technocrats in governments—might be expected to become the primary players on this issue. They may be well-placed to play a significant future role. Indeed, one might speculate that the set of engineers traditionally concerned with electricity systems could conceivably form an "epistemic community" that may ultimately have considerable influence. Groups of economists developing transborder systems for renewable energy certificates may be additional candidates for a governance role.

We are witnessing a restructuring of electricity industries across North America, albeit at varying speeds and to various extents. This is serving to encourage participation in electricity systems; as a consequence, what has traditionally been a very conservative industry is facing challenges on a range of issues, for example, environmental issues as well as new ideas such as distributed generation. Prodded by constituencies interested in these sorts of questions, it is the elected officials who are serving to explore innovative ways forward on this issue in ways that the dominant epistemic community has not been able to do.

Notwithstanding potential future impact, it is also worth considering the extent to which "policy ideas"—whoever generates them—are having an impact across borders. We can pick up examples flowing both south-to-north, as well as north-to-south. The popularity of the RPS system in the United States certainly has influenced decision making in some Canadian provinces. Conversely, the initiative on feed-in tariffs in Ontario has had at least some influence in the other direction.

We conclude this broader reflection upon international environmental governance with two observations about how the issue of renewable electricity is being framed. As illuminated, in particular, in the in-depth case study in this chapter, as well as elsewhere (e.g., Rowlands, 2007; and Rowlands, forthcoming-b), renewable electricity often is advocated initially for reasons of environmental preservation or rehabilitation, in particular, to avert climate change. But this public declaration evolves, as the issue develops, into a rationale involving economic development and public health issues. Consequently, the way in which the issue is "framed"—in terms of the challenges it is designed to meet—by supporters and opponents is significant. The geographic scope is critical as well. At this point on the issue of renewable electricity, we see sometimes see "competing scales" at work. From the eastern part of the continent, we saw a bilateral relationship that could potentially be at odds with a larger biregional one. In the middle of the continent, we see a number of organizations with overlapping membership (e.g., the Midwestern Governors Association, the Midwest Independent Transmission System Operator and the Midwest Renewable Energy Tracking System), each claiming an interest in this issue. And the participation of the Canadian provinces of Québec and Ontario in the *Western* Climate Initiative (emphasis added) lends further weight to the observation that geographic scope can be "socially constructed"; accordingly, how these issues are framed will have impact upon the development of governance arrangements.

The purpose of this chapter is to investigate the ways in which efforts to promote the increased use of renewable electricity in either Canada or the United States have been affected by transnational actors, institutions and structures. The context was set by reviewing renewable electricity—both physical resources and policy strategies—in each country. Links between the two countries on this issue were also reviewed. There

followed in-depth examination of the activities unfolding on the eastern part of the continent—in a general context, between Eastern and Atlantic Canada and New England, and then more narrowly between New Brunswick and Maine. After flagging other cross-border areas of interest, we offer broader reflections upon how governance arrangements on this issue might possibly unfold. As interest in renewable electricity grows across both Canada and the United States, not only are policymakers set to learn from other binational environmental governance experiences, but they are also set to contribute to our understanding of the same.

NOTES

1. For more about the benefits of international cooperation on electricity issues, generally, see, for example, E7 (2000).
2. The vast majority of these imports (79 percent) were from New Brunswick; smaller amounts were from Québec (19 percent) and Nova Scotia (3 percent) (NEB, 2006). (Numbers do not add up to 100 because of rounding.)
3. Operation of the electricity system that stretches across the international border has also been addressed by the Northeast Power Coordinating Council (noted above). Here, however, we concentrate upon governance bodies than have focused more upon policy.
4. Information about Canadian renewable electricity policies is taken from Lipp (2007) and Rowlands (forthcoming).
5. Information about U.S. renewable electricity policies is taken from DSIRE (2008).
6. Not only is there a physical interconnection between the two jursidictions, but the Maine Public Service Service system (in the northern part of the state) is not even connected to the rest of the electricity system in Maine; its only interconnection is with the New Brunswick system (New Brunswick/Maine, nd, p. 13).
7. Even if New Brunswick does not generate all of the electricity itself, it could "wheel" electricity from hydropower facilities in Newfoundland and Labrador (for example) and receive revenues for doing so (New Brunswick/Maine, nd, p. 4, for example).
8. That having been said, in the recommendations that the working group put forward, there was acceptance that the resources could come from out-of-state and even Maritime provinces (Maine, 2006).

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Chapter 12: The Absence of Governance: Climate Change in Canada and the United States

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Twenty years ago, Canada and the United States seemed destined to lead the international response to climate change, recognizing that the devastating effects of global warming will cross national borders. However, the two countries parted ways when confronted with ratification of the Kyoto Protocol and have continued along separate paths. This paper examines this divergence and considers possible next steps. Ottawa's endorsement of Kyoto has not produced results at the provincial level or in federal policy. Conversely, in the United States, there has been a vacuum of federal leadership following rejection of Kyoto but many states have unilaterally or multilaterally taken steps to reduce carbon emissions. There are nascent state attempts to recruit bordering Canadian provinces as partners in some regional initiatives. Transboundary progress on climate change has thus far occurred as a "bottom-up," i.e., regional and local, rather than "top-down" phenomenon. But there is still a role to be played at the federal level and a possibility of expanded American federal engagement. The author proposes that as a starting point, the United States and Canada should establish a bilateral infrastructure to track and verify both nations' progress on climate change and explore other opportunities for collaboration.

Saskatchewan has experienced a greater rate of growth in its greenhouse gas emissions since 1990 than any other Canadian province or American state. This is due to tremendous expansion in its use of fossil fuels, with a growth rate more than three times that of overall American emissions during this period. At the same time, Saskatchewan has hosted one of the world's earliest and most ambitious carbon sequestration projects. This has entailed injection of more than three million tons of carbon dioxide per year into subterranean caverns. The primary intent is to promote "enhanced oil recovery," whereby the injection forces supplemental oil deposits to the surface. An added benefit is the prospect of permanently preventing the carbon dioxide from being released into the atmosphere.

Consequently, this Weyburn, Saskatchewan site has offered an early test of a potentially promising technology to store carbon dioxide and possibly assist in mitigating climate change. Ironically, the very carbon dioxide that has been pumped into the ground has been produced in neighboring North Dakota, a byproduct of a gasification plant and shipped across the national border via pipeline (Riding and Rochelle 2006). This project has been supported by a combination of private sources but also a unique partnership between Natural Resources Canada and the U.S. Department of Energy.

Beyond this experiment, there is remarkably little formal collaboration between Canada and the United States on the issue of climate change. Vast literatures serve to frame the looming threat of climate change in both nations. Bodies such as the International Joint Commission (IJC) and the Commission for Environmental Cooperation of North America, as well as non-governmental organizations, have

KEY TO ABBREVIATIONS

CEC	Commission for Environmental Cooperation of North America
EU	European Union
ETS	Emissions Trading Scheme (of EU)
FCCC	United Nations Framework Convention of Climate Change
GHG	Greenhouse gases or greenhouse gas emissions
IJC	International Joint Commission
RGGI	Regional Greenhouse Gas Initiative
RPS	Renewable Portfolio Standards
WCI	Western Climate Initiative
WTO	World Trade Organization

published studies outlining the risks of climate change in both nations (IJC 2003; CEC 2002; National Wildlife Federation 2007). These reports examine not only the prospect of elevated temperature but also the proliferation of extreme weather events, public health risks due to changing patterns for disease transmission via insects, declining surface water levels, elevated sea levels, and shifts in agricultural productivity (see Heinmiller chapter, this volume). Such reports are consistent with those generated for each nation or various regions therein. They provide a common framing for an environmental challenge that is daunting in its potential impact, with cascading effects that could influence virtually every other area of environmental governance addressed by contributors to this volume, from fisheries habitat to availability of drinking water. These types of documents also confirm the sizable contributions that Canada and the United States make to the global release of carbon each year. Not only are these nations' per capita rates of emissions among the very highest in the world but, together, they continue to generate nearly thirty percent of global emissions per year. They obviously cannot solve the problem of climate change through unilateral actions but clearly need to play significant roles in any serious effort to reduce global emissions and thereby alleviate potential impacts.

Ironically, climate change is not a new environmental challenge, though its saliency in both Canada and the United States has increased markedly in recent years. Twenty years ago, former Prime Minister Brian Mulroney heralded the era of global climate governance with a high-profile opening address at the International Conference on the Changing Atmosphere hosted in Toronto. This produced a recommendation that global greenhouse gas emissions be reduced 20 percent by 2005, which was supported by both Canadian and American governments. A few years later, both nations had ratified the United Nations Framework Convention of Climate Change (FCCC), calling for national emissions stabilization at 1990 levels by 2000. This then led to the 1997 negotiation of a binding international agreement, the Kyoto Protocol. In this instance, Canada and the United States took remarkably similar positions to the bargaining table and left Kyoto with nearly-identical emission reduction commitments that were to be realized by the end of the current decade.

All of this activity between the late 1980s and late 1990s suggested that climate change would essentially be framed as a challenge of international governance, requiring some formal cooperation among nations through various venues of international diplomacy. During much of this period, both Canada and the United States acknowledged that climate change was indeed a serious threat and they demonstrated considerable consistency in their research on problem severity and general receptivity toward engagement in these negotiations. Both increasingly acknowledged that early experiments in soft environmental law, such as nonbinding commitment under the FCCC, produced few if any intended results and needed to yield to some form of hard environmental law established through a treaty that featured formal reduction targets and compliance mechanisms.

Some two decades after the Toronto conference and more than a decade after Kyoto, international climate governance remains in tatters. Most parties that ratified the Kyoto Protocol, including Canada, are nowhere close to their emission reduction targets. Indeed, Canada was pledged to reduce its emissions by six percent from 1990 levels but its actual emissions soared more than 26 percent between 1990 and 2004. It is commonly recognized that Canada will not begin to approach its Kyoto commitment, barring cataclysmic collapse of its economy and attendant emissions decline. Ironically, the United States spurned Kyoto ratification but actually has a rate of emissions growth below that of Canada, approximately 15 percent above 1990 levels by 2004.

At least part of this differential, however, can be attributed to increased American import of Canadian goods, whereby emissions from manufacturing are registered in Canada. Collectively, these two cases demonstrate that the absence of climate governance has produced disturbing performance results, despite initial hopes that purely-voluntary strategies and technological development would prove sufficient to reverse past trends of emissions growth.

At the same time, even the strongest international supporters of Kyoto, such as the European Union (EU), have struggled to meet various national targets in many cases and have faced significant challenges in implementing a continental emissions trading system, the EU Emissions Trading Scheme (Ellerman, et al. 2007). Other major ratifying nations, such as Japan and Australia, have also struggled to develop policies and reduce emissions growth. Of course, emerging economies such as China and India were never bound by Kyoto and have seen extraordinary rates of greenhouse gas emissions growth in recent years, leaving very few models for effective climate governance if indeed the goal is stabilization and reduction of emissions.

Hope springs eternal for further international diplomacy and a seamless international agreement. But the growing reality of climate policy in North American and elsewhere is a patchwork quilt of national and subnational policies and emission reduction commitments, often leading to formal collaboration between various jurisdictions. Some scholars have begun to suggest that the next generation of climate policy will involve a mixture of subnational, national, and multi-national agreements, developed through unique networks or partnerships. Such arrangements are most likely in cases where energy and related resources are shared and natural boundaries emerge for defining collaboration, whether shaped by a regional electricity grid that transcends jurisdictional boundaries or formal compacts among governments with a history of collaboration. This allows considerable opportunity to take advantage of economies of scale and establish governance rules among institutions with some prior working relationship and trust. Such a bottom-up approach suggests possible precedents from the development of trade and monetary policy, with a gradual move toward cross-national, continental, and, in some instances, international collaboration, but allowing for some degree of regional, national, and even subnational variation. It clearly reflects a different model than that which has animated much international environmental policy and climate change deliberations, with presumed movement toward expanded international authority over sovereign nations and development of new institutions such as a World Environment Organization (Speth and Haas 2006).

This would seemingly create tremendous opportunity for collaboration between Canada and the United States, with Weyburn perhaps serving as a metaphor for extended policy engagement. But the increasing engagement of individual states, provinces, cities, regions, and, in the United States, even the federal government, continues to have an ad hoc quality. There is simply no governance entity currently in operation that has much if any role in promoting collaboration on greenhouse gas reductions, and all of the potential economies of scale and collaborative opportunities across policy arenas that this might entail. Instead, collective climate governance bringing together Canadian and American entities is largely nonexistent.

This chapter is intended to further explore this lack of governance and also consider possible alternatives. It begins with a more detailed overview of ongoing climate policy development within both nations, placing particular emphasis on unexpectedly high levels of American state and regional policy engagement. This section will also consider early experimentation with creation of a Western regional zone for carbon emissions trading that links five states and two provinces in a formal agreement. It then reviews a series of possible collaborative governance options, but examines some of the enduring stumbling blocks to such coordinated action. The paper concludes with references to other models around the globe, whereby neighboring nations have decided to work together on this issue, with particular attention to the cases of Australia and New Zealand as well as the European Union. Indeed, we will ask why it has proven so hard for Canada and the United States to find common ground on climate change, given the somewhat different record among other neighboring jurisdictions, and explore whether greater collaboration in the coming decade is indeed a possibility and what that might entail for the future of Canadian and American environmental governance.

NATIONAL DIVERGENCE AS A BARRIER TO COLLABORATION

The absence of common engagement by Canada and the United States on climate change may be at least partly attributable to important points of divergence in their respective policy development processes. Kyoto is, of course, a fundamental point of departure. A history of fairly unified bargaining in all sessions leading up to Kyoto, on issues such as liberal definition of carbon sinks to allow substantial advantage to heavily-forested areas of Canada and the United States, quickly evaporated after both nations signed the agreement but pursued different ratification routes. In the United States, stiff opposition in the Senate deterred any serious consideration of ratification in the remaining years of the Clinton Administration and remarkably little was said by then-Vice President Al Gore in the 2000 presidential race about his plans for moving toward ratification. The subsequent Bush Administration decision to withdraw the United States from Kyoto in 2001 generated headlines around the world but was largely anticlimactic.

This process gave Canada two distinct options based upon the asymmetries whereby the United States tends to dominate the binational relationship (McDougall 2006; Stuart 2007). On the one hand, Canada could clearly withdraw from Kyoto, citing considerable risks of unilateral implementation given its degree of economic interdependence with the United States. This position was strongly endorsed by many prominent industrial organizations and a clear majority of provinces, led by Alberta. On the other hand, Canada could ratify Kyoto and thereby lay claim to the mantle of North American moral superpower on climate, using ratification to differentiate itself from the United States and pursue a position more closely allied with the European Union. Ultimately, the latter decision was taken, heavily influenced by the desire of outgoing Prime Minister Jean Chretien to leave ratification as one of his primary legacies after decades of public service.

Canadian ratification did not necessarily commit Ottawa to do anything, aside from a dizzying array of voluntary programs and subsidies for alternative energy sources that appear to have little if any impact on emissions (Jaccard 2007). But treaty endorsement allowed Canada to remain a respected partner in ongoing international negotiations and may actually have bought it some cover for policy inaction for at least the first few years after ratification. Indeed, much of the climate policy community marveled at Canadian commitment and willingness to stand apart from the United States, obscuring its near-total lack of follow-through. At the same time, this action served to formally weaken potential collaborative ties between the two nations. Indeed, even the trading of emission credits under neighboring cap-and-trade systems, had they been established on both sides of the 49th parallel, would have been rendered meaningless for Canada as trades were only legitimate for Kyoto purposes if conducted with ratifying parties. This step did not formally seal the borders to policy cooperation but certainly chilled any possible action. It has also left respective Parliaments thrashing for legislative output to demonstrate some movement toward approaching Kyoto commitments.

In contrast, American withdrawal from Kyoto earned it opprobrium in Ottawa, Brussels, and around the world as a climate scofflaw. The American federal government further contributed to this perception through prolonged inactivity. Indeed, legislative products with some possible impact on climate were actually quite similar to Canadian policy, larded with distributional subsidies to virtually every generator of energy (low-carbon or otherwise) and voluntary reduction programs. This began to change in December 2007 with an energy bill that included some increase in mandatory vehicular fuel economy. This step has been followed by a flurry of proposals under consideration in the 110th Congress. But the overall pattern of disengagement by executive and legislative branches in Washington further contributed to a global portrait of American disengagement for collective action related to greenhouse gas emissions, giving further cover to its smaller neighbor which was in essence pursuing a similar strategy in Ottawa.

At the same time, however, American state governments began in the late 1990s to use their own authority to enact policies designed to reduce greenhouse gases with unanticipated aggressiveness. This represents another point of American and Canadian divergence, as most provinces have done stunningly little during this period. Indeed, much provincial climate policy effort has focused on trying to extract various forms of rent in exchange for cooperation with a Canadian federal government encumbered by Kyoto ratification rather

FIGURE 12.1. State Climate Policy Adoption and Greenhouse Gas Emission Trends

Emission Growth Trends (1990-2004)

	HIGH (>15%)	LOW (<15%)
HIGH (2 OR MORE POLICIES)	*10 States* Arizona Minnesota Oregon	*12 States* California New Mexico Pennsylvania
LOW (0-1 POLICIES)	*22 States* Alabama Florida Texas	*7 States* Louisiana Michigan West Virginia

Levels of State Climate Policy Adoption*

FIGURE 12.2. Provincial Climate Policy Adoption and Greenhouse Gas Emission Trends

Emission Growth Trends (1990-2004)

	HIGH (>15%)	LOW (<15%)
HIGH (2 OR MORE POLICIES)	*1 Province* British Columbia	*0 Provinces*
LOW (0-1 POLICIES)	*7 Provinces* Alberta Ontario Prince Edward Island New Brunswick Newfoundland Nova Scotia Saskatchewan	*2 Provinces* Manitoba Québec

Levels of Province Climate Policy Adoption*

* Measures the adoption of the following policies within a state or province: Renewable Portfolio Standard, Carbon Tax, Renewable Fuel Standard, Carbon Cap-and-Trade, Formal Emissions Reduction Target.

than take unilateral policy steps well within their expansive powers over natural resources and environmental protection (Rabe 2007). But as the provinces huffed and puffed about Ottawa, a surprisingly wide collection of states began to act unilaterally or in concert to develop significant new policy initiatives. This variation in subnational policy development and state and provincial emission trends are reflected in Figures 12.1 and 12.2, demonstrating that a far larger percentage of American states have made substantial policy commitments and achieved more modest emissions growth than a comparable percentage of their Canadian provincial counterparts.

This burgeoning bottom-up process in the United States involves essentially all imaginable options in the kit box of climate policy tools. Twenty-six states have enacted renewable portfolio standards (RPSs), which mandate a consistent increase in the supply of electricity provided from low-carbon sources. These RPSs now apply to more than 60 percent of the American population and are under active consideration in many other states; they serve as a principal driver behind substantial growth in adoption of new renewable energy capacity in the United States in recent years. In turn, 15 states have made formal commitment to a carbon trading program that would essentially parallel the EU ETS and six more have announced their broad intent to follow suit. California has attempted to use its powers to request a waiver under federal clean air legislation to implement its own legislation that would mandate dramatic reduction in carbon emissions from newly-manufactured vehicles. Seventeen other states have vowed to adopt the California standard if the federal government grants the waiver, and initial executive branch reluctance will continue to be challenged by states in the courts.

Alongside unilateral experimentation, a growing number of states have attempted to enact multiple policies. California, for example, is simultaneously pursuing its vehicle emissions program in addition to developing cap-and-trade, energy efficiency, low-carbon fuel, and renewable energy mandates in pursuit of statutory emission reductions by 2020 and 2050 that would exceed those of any other government in the world. Other states that have large populations and greenhouse gas emission levels and have enacted a multiplicity of climate policies include New York, Pennsylvania, Illinois, New Mexico, and Arizona. At the same time, even historically inactive states such as Florida, Michigan, North Carolina, Texas, and Virginia are beginning to follow suit (Rabe 2008).

As a result, the American federal system has produced a diametrically different pattern from its Canadian neighbors. American federal disengagement from Kyoto has coincided with increasingly active state-level policy development, whereas Canada's formal embrace of

Kyoto has generally been met with disdain from the provinces. Even those provinces most outwardly supportive of Kyoto ratification, such as Manitoba and Quebec, have yet to begin to approach their more active American state neighbors in actual policy development. This may be beginning to change, most notably in the case of British Columbia, perhaps opening opportunity for cross-border collaboration.

SIGNS OF POSSIBLE CONVERGENCE

Despite these gaping differences, there are some significant similarities between the respective nations and even a few indicators of possible collaboration across the national border. Indeed, both federal governments have continued to struggle to formulate significant policy initiatives, despite innumerable proposals. The Climate Change Protection Index (CCPI), which evaluates the climate protection efforts of the central governments of 56 industrialized and rapidly-industrializing countries, finds strong similarities between Canada and the United States and ranks them near the very bottom among these nations. In the 2007 version of the CCPI, Canada ranks 51st out of the 56 entries, with the United States in 53rd place. The two countries are separated only by Kazakhstan and barely ahead of China and Saudi Arabia. So both of these federal governments consider any future federal policy engagement essentially from ground zero, among the world's leading laggards.

In turn, public opinion polling is rarely conducted with identical questions posed in both countries. But major polling in recent years suggests considerable uniformity of opinion on climate change, as reflected in Angus Reid (in Canada) and Pew polls (in the United States), as well as other reputable survey efforts. This reflects public sentiment about the existence of climate change and its perceived severity, as well as receptivity to a range of policy tools. There appears to be strong sentiment in both nations for a substantial increase in efforts to reduce greenhouse gas emissions, but particularly strong support for those tools perceived as not imposing substantial direct costs on individual citizens. This may explain the strong state government preference for such regulatory tools as renewable portfolio standards (in 26 states and two provinces) as opposed to carbon taxes.

More concretely, however, there have been some signs of cross-border collaboration that does not involve Ottawa and Washington but rather represent ad hoc regional arrangements, consistent with a phenomenon evident elsewhere in the volume. Perhaps most significantly, British Columbia and Manitoba have not only become the most active provinces in terms of unilateral policy development but have formally linked their efforts with five Western American states, Arizona, California, New Mexico, Oregon, and Washington, in the Western Climate Initiative (WCI), which was launched in 2006 by California and initially focused on state partners. British Columbia and Manitoba formally joined the WCI in 2007. In March 2008, the WCI released detailed draft plans for development of a regional cap-and-trade program for carbon emissions (WCI 2008).

British Columbia took particularly aggressive unilateral actions shortly before joining the WCI, including a formal target to reduce its greenhouse gas emissions by one-third from current levels by 2020, which would place them approximately 10 percent below 1990 levels. It also set intermediate targets for 2012 and 2016 as well as longer-term targets for 2050. The province also agreed to set carbon emission standards for all vehicles sold in British Columbia, through a policy that has some parallels with the California legislation and thereby veers away from the Canadian tradition of voluntary standards for vehicle emissions and fuel economy. It also established a provincial Climate Action Team that cut across ministries with some likely role in climate change and introduced a carbon tax in February 2008 that is designed to create a pricing disincentive to deter fossil fuel use (Fowlie and Anderson 2008). The carbon tax would generate an estimated $2 billion during its first three years of operation, which would be returned to citizens and businesses through tax credits. "In British Columbia, we don't need to look to the work of the Intergovernmental Panel on climate change to know we've got a problem," said British Columbia Premier Gordon Campbell in announcing the new initiatives. "The evidence is all around us, and it obliges all of us to adapt."

Entry into the WCI committed both provinces, however, to developing a "regional market-based multi sector

mechanism" for emissions reduction. All WCI members are required to have formal reduction targets and are expected to use the regional system, most likely an emissions trading regime, to attain much if not all of their reduction goals. These respective states and provinces have also agreed to establish a common registry to track and manage credit trading for all emissions covered under the plan. "We welcome British Columbia's participation in the Western Regional Climate Action Initiative," said California Governor Arnold Schwarzenegger in April 2007 after British Columbia signed a memorandum of understanding to officially join the WCI. "We all share the same goals of reducing greenhouse gas emissions and addressing climate change while boosting economic growth. Premier Gordon Campbell's leadership on this issue is helping our two countries take a collaborative approach that will result in real actions and innovative solutions that will have an impact across the globe."

Manitoba has a longer track record of support for greenhouse gas reduction policies, though it has tended not to match its rhetoric with implementable policies comparable to those of British Columbia or many leading states. The province made a major effort to build a strong climate policy team earlier in the decade but much of this effort collapsed after staff departures (Rabe 2007). But Manitoba has demonstrated a remarkable proclivity to sign cooperation agreements with various states. In addition to joining the WCI, Manitoba also agreed in November 2007 to join with six Midwestern states (neighboring Minnesota, as well as Illinois, Iowa, Kansas, Michigan, and Wisconsin) in establishing the Midwestern Regional Greenhouse Gas Reduction Accord (Pendergrass 2007). This agreement thus far has much less detail than the WCI and a number of the participating states have not been active in early development of their own carbon cap-and-trade systems. Several years prior to the Midwestern agreement, Manitoba also joined with another subset of Midwestern states to form "Powering the Plains," a collective designed to promote regional renewable energy sources and other methods to reduce greenhouse gases that were particularly well tailored to these jurisdictions.

One earlier effort at cross-border collaboration involved six New England states along with Quebec and the Maritime provinces in an attempt to establish a regional zone pledged to common levels of greenhouse gas reduction by 2010 and 2020. This followed a long-standing set of common agreements among these jurisdictions, only some of which have an environmental policy focus. Some of these jurisdictions, primarily the states, are on track to meet their 2010 goal of holding to 1990 emission levels. But there has been little of the promised development of common standards and policies, with most subsequent effort involving resolutions that support the general goals but offer few details.

Perhaps most significant, the six participating states are part of a larger American regional effort known at the Regional Greenhouse Gas Initiative (RGGI). This initiative also includes New York, New Jersey, Maryland, and Delaware and may expand to include other states such as Pennsylvania. All participants will be linked through a formal cap-and-trade program for coal-burning utilities that is scheduled to begin operation in 2009 and achieve a 10 percent reduction in emissions in its first decade. The RGGI states make clear their eagerness to serve as a possible model for federal policy but also have repeatedly contended that they will only work cooperatively with any future federal legislation if it sets standards at the same or greater level than the regional effort. The RGGI process was developed through several years of intensive collaboration between lead environmental and energy officials from participating states (Rabe 2008a). During nearly five years of deliberations, Canadian provinces (including those in the agreement with New England) have been regularly invited to attend sessions and consider membership. New Brunswick has remained a formal "observer" but no province has formally entered into the RGGI system thus far and there is no indication that this will change in the near future.

Consequently, there has been some attempt among neighboring states and provinces to begin to think about cross-border collaborations, most of which emphasize some version of an emissions trading mechanism for carbon. All of these have emerged without any active engagement or encouragement from respective federal governments, much less any binational or continental authority, and vary in detail from region to region. To date, the WCI is the only one that clearly outlines formal commitments and expectations of membership, thereby approximating the RGGI and the EU ETS rather than more symbolic efforts that lack any mechanisms to achieve reduction goals, however lofty they might be. The WCI precedent does raise the question of whether this could be the beginning of a larger pattern in cross-border climate governance, a topic to which we will return.

THE CASE FOR EXPANDED COLLABORATION

Barring some sudden leap toward a new international regime, which is hard to envision for numerous reasons, both Canada and the United States enter the "post-Kyoto" era with very modest track records of climate policy development and implementation. Aside from Canada's symbolic embrace of Kyoto and a patchwork quilt of policy development among American states, these North American neighbors are increasingly depicted in international circles as short on action, long in exacerbating the severity of likely climate change, and laggards in seizing the opportunity to develop new climate-friendly technologies and skills for which vast new markets are anticipated. This raises the possibility of whether some common action or strategy, perhaps building on the modest step of the WCI, might constitute a reasonable next step. There is no binational institution which has currently taken the lead on this issue or any organizational "home" for shared climate thinking, much less governance. But there is increasing recognition, at least among some individual scholars, think tanks, and nongovernmental organizations that a case can be made for at least some degree of cross-border engagement, whether it entails emissions mitigation or even adaptation strategies.

Much of this recognition reflects the extraordinary energy interdependence between the two nations, particularly through American importation of electricity and transport fuel. Cross-border trade in electricity began more than a century ago when Ontario and New York created an interconnection between power generating facilities at Niagara Falls (Averyt 1992). It has steadily increased in subsequent decades and some American regions are dependent on substantial quantities of imported electricity. The 10 states that comprise the RGGI zone, for example, secure more than 11 percent of their electricity from Canada each year. Ironically, Canada does not impose any restrictions on carbon emissions from its electricity imports, despite its ratification of Kyoto, whereas RGGI states have a carbon cap-and-trade system but can only address emissions generated among participating American states.

This interdependence may only grow in coming years, in large part because the literal infrastructure for conveying electricity across extended distances in Canada and the United States is much stronger on a north-south continuum than in an east-west direction. There are already more than 100 power grid linkages between Canada and the United States and some effort to improve those has continued in recent years, particularly in Western areas. As one member of Parliament noted last year, "Currently there are more electricity lines between Canada and the United States than there are lines between Canadian provinces" (Bevington 2007). Some provincial premiers have frequently sought federal subsidies to bolster east-west transmission ties, most notably Ontario and Manitoba as a condition of their engagement in the Kyoto process (Rabe 2007). But virtually all premiers have actively supported stronger north-south ties in electricity exports, with the greatest enthusiasm emanating from Manitoba and Quebec. Both of these provinces feel that they could dramatically expand their currently substantial capacity in hydro power that could more efficiently be sold to American consumers than to those in other provinces. Indeed, Manitoba Premier Gary Doer regularly meets with counterparts in neighboring states such as Minnesota, not only to engage in organizations such as Powering the Plains, but also to explore the possibility of greater province-to-state electricity trade. Similar economies of scale are evident in other areas of energy supply.

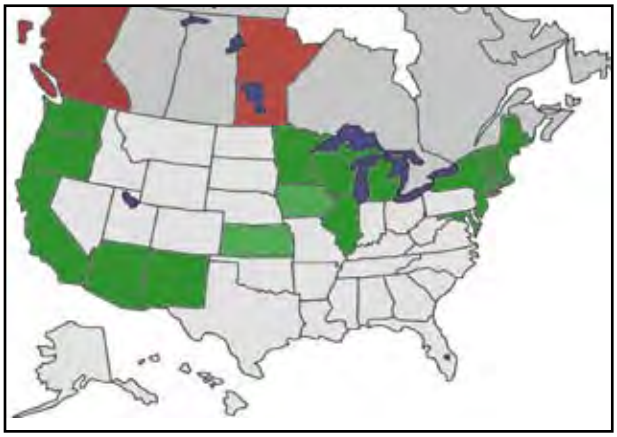
This physical reality of energy generation and transport underscores the complexity of sustaining two separate policy regimes at the 49th parallel. Ten of the 14 states that border Canada have made some commitment to a carbon cap-and-trade program, with RGGI the furthest advanced. Among the provinces, only British Columbia and Manitoba (through their recent entry into the WCI) have any linkage with these emerging trading areas and neither has yet to develop significant internal policy capacity in carbon emissions trading (see Map 12.1). Combined with the real possibility of a federal cap-and-trade bill in the 111th Congress, what could emerge in the next few years is a rigorous American carbon emissions trading zone alongside a very modest policy infrastructure in Canada. This poses obvious concerns of "leakage," namely whether the absence of carbon pricing and credit allocation in Canada creates a huge incentive for Americans to purchase even more quantities of Canadian electricity, given the absence of regulation. In turn, this raises the issue of some kind of

common standards and even the spectre of a shared emissions trading regime. Such a regime could begin with the electricity sector but, as we are seeing in California and the European Union, any cap-and-trade system could readily be expanded to other carbon sources, whether fixed entities such as industries or mobile sources such as all commercial flights in the two nations.

Collaboration could also extend to other areas where some form of carbon-related regulation was developed. The issue of renewable portfolio standards is instructive here, especially given the dense concentration of American RPSs in states that share a border with one or more Canadian province (see Map 12.2). No two jurisdictions with an RPS define renewable energy in identical ways and often establish special provisions to boost a specific renewable technology that has a strong base of political support in a particular jurisdiction. In turn, we are also seeing a growing pattern of "RPS protectionism," whereby authorizing legislation is somewhat discriminatory against electricity generated outside of the single jurisdiction, even in cases where it might be less expensive and more environmentally-friendly. This is especially possible among the provinces, given the absence of a Constitutional Commerce Clause to protect cross-border commerce, as reflected in Nova Scotia's policy to confine eligible electricity to sources generated within the province (see Rowlands chapter). Collectively, this type of constraint likely deters full development of renewable potential in Canada and the United States, leaving little room for both shared development of technology and making renewables as price-competitive as possible with conventional sources.

Indeed, whereas some neighboring states have begun to try to establish "renewable energy credits" that would be transferable across states through bilateral agreements, none of this activity has crossed any state-and-provincial border yet. Looking ahead, one could envision a true patchwork quilt of RPSs, perhaps a blending of state, provincial, and federal policies that work at cross-purposes with one another. As in the case of a cap-and-trade program, some mechanism to establish common definitions and develop a viable trading system of renewable energy credits across these various jurisdictions could serve to ease the transition to renewables and thereby provide one path to reduced emissions of greenhouse gases. Similar issues emerge in the arena of renewable fuels, particularly those derived from plant material, given the extreme difficulty of transporting these through pipelines and reliance instead on some form of ground transportation.

Map 12.1. States and Provinces with Carbon Cap-and-Trade Policies



Map 12.2. Renewable Portolio Standards in States and Provinces

Source: The maps were made by Cartographer Paul deGrace

Comparable opportunities emerge for virtually every other arena of possible policy development relevant to climate change, from carbon emission standards for vehicles to sequestration strategies that build upon the Weyburn experiment. Collectively, an effort to achieve greater unity in Canadian and American approaches might also maximize the potential for both nations to take full advantage of the economic development opportunities likely to accrue to those governments that actively and effectively develop new technologies and skills that will be in high demand in a carbon-constrained economy. Just as many private firms are attempting to take the advantage by becoming "first movers," many governments (most notably American states in a North

American context) are taking similar approaches. But just as the European Union is trying to position itself as the "world leader" in this arena, there could be obvious advantages to some form of collaboration between Canada and the United States, not only to find ways to reduce emissions but to prepare both to take a global role in the development and transfer of essential technologies and skills. We will consider possible approaches to such a partnership after reviewing likely impediments and challenges facing any such collaboration.

THE CASE AGAINST EXPANDED COLLABORATION

Translating the case for climate collaboration into some form of policy guided by some organization or network is no small task. No existing binational or continental institution has assumed anything that approaches a lead role on climate change; hence there is no obvious starting point for any form of common policy development. As noted, organizations such as the IJC have compiled research reports highlighting likely cross-border threats posed by continuing climate change. The Commission on Environmental Cooperation has sustained detailed analysis of continental energy markets and concluded in a 2002 report that "There is interest in, and good potential for, transboundary emissions trading within North America" (CEC 2002, 23). But it is hard to point to any existing institutional base from which to launch a serious collaborative effort, aside from periodic efforts by think tanks such as the C.D. Howe Institute in Toronto or the Wilson Center in Washington to convene private, governmental, and research stakeholders for broad discussions of collaborative opportunities.

Collaboration is further complicated by significant asymmetries in this case. This includes, of course, the familiar concern raised by many Canadians about power imbalances given the vast scope of the American population and economy in comparison with Canada. Historically, this has contributed to a number of decisions to attempt to preserve Canadian independence from the United States, such as prolonged efforts to maintain a separate currency and monetary policy despite periodic pressures for convergence (Helleiner 2006). It has also sustained a cottage industry of scholarship that chronicles and laments continual pressures on Canada to submit to integration pressures, whether overt or "stealthy" in nature (McDougall 2006). Ironically, more recent iterations of this thesis emphasize numerous areas in which Canadian identity appears threatened through asymmetries that prod Canada toward convergence, but downplay cases where Canada chooses a policy route fundamentally different from the United States. Indeed, it is hard to review the last decade of climate policy in Washington and Ottawa, much less subnational units, and see any American pressure to conform, whether at the point of Kyoto ratification or development of serious climate policy tools subnationally. This is evident in the near-constant refrain in Canada of developing a climate policy "made in Canada," which thus far has translated into a mish-mash of loosely-structured programs that, if anything, lag behind the United States.

Nonetheless, these concerns persist and likely serve to mitigate any serious attempt to link future efforts to reduce greenhouse gas emissions. A further impediment to collaboration is substantial variation in policy capacity, beginning with technical expertise in emissions trading and extending, perhaps philosophically or culturally, to differences about the appropriateness of a cap-and-trade approach. As a pioneer in emissions trading mechanisms, the American federal government and all 50 states have considerable expertise in emissions trading for various air contaminants and in related arenas of environmental protection (Raymond 2003). This experience has clearly been evident in unilateral state programs to develop carbon cap-and-trade regimes very early in the current decade (Rabe 2004) and more recent efforts such as the RGGI and the WCI to operate on a regional basis. All of these efforts are staffed (and, in some instances, guided) by state agency officials with considerable expertise in various forms of emissions trading and relative comfort with the challenges of transitioning to apply this same tool to carbon emissions. In turn, most of the Congressional deliberations over climate change in the 110th Congress have focused on various forms of a federal cap-and-trade mechanism, most notably the American Climate and Energy Security Act sponsored by Representatives Henry Waxman (D-CA) and Edward Markey (D-MA) that passed the House of Representatives by a 219-to-212 margin in June 2009 and moved to the Senate for

> There appears to be strong sentiment in both nations for a substantial increase in efforts to reduce greenhouse gas emissions, but particularly strong support for those tools perceived as not imposing substantial direct costs on individual citizens.

further consideration. President Barack Obama has endorsed this bill, while expressing some concerns over its potential restrictions on cross-border trade.

In contrast, emissions-trading has moved at a much slower pace in Canada, both for conventional air contaminants and more recently for greenhouse gases. Both federal and provincial authorities have generally rejected trading mechanisms in favor of some blend of voluntary and regulatory strategies for air contaminants, and some modest early provincial efforts to establish experimental carbon trading systems (such as in British Columbia and Ontario) essentially collapsed. Such resistance to this approach and the attendant lag behind the United States may be attributable to several factors. First, there may be legal and Constitutional constraints on development of this method in Canada, whereas there have been no such questions in the United States. As legal scholar Alasdair Lucas has noted, there is "at least a likelihood that the federal government lacks constitutional authority to legislate national standards and the necessary framework for a national emissions trading program. The result is that federal-provincial agreement is necessary and constitutional jurisdiction is not a strong candidate for either negotiating side" (Lucas 2004, 191). Second, there may indeed be resistance to such policy tools from key ministries, either on normative grounds, greater familiarity and comfort with conventional policy tools, and economies of scale given relative number and size of private and public greenhouse gas sources in the Canadian case (Rabe 2007). Legal scholar Katrina Wyman has offered a particularly nuanced interpretation of the Canadian "slowness to introduce pollution markets," one that places less emphasis on cultural consideration and emphasizes economic and related factors (Wyman 2002). In turn, a series of economists have raised growing concern about the capacity of Canadian institutions to design an effective cap-and-trade system given limited expertise and pressures to weight down such a system with all sorts of exemptions and special preferences for particular sectors or provinces.

Regardless of the ultimate rationale for Canadian recalcitrance, the clear reality is that the United States is primed to move from a regional toward a national system of carbon emissions trading, even though many political hurdles remain and the implementation challenges are potentially daunting. In contrast, Canada has little significant policy development under way in this area and scant history with use of market mechanisms of this sort in any environmental arena aside from fisheries management. So far beyond conventional concerns about power asymmetries among these neighbors is a rather fundamental difference in policy approach and capacity that could prove extremely difficult to blend into any shared system. Given this imbalance, even such issues as developing mechanisms to oversee emissions credit transactions or approve carbon offsets in trading seem hard to reconcile across the national borders. One exception here may be instances in which one or more provinces move in an "American direction" and use their considerable constitutional latitude to develop a "home grown" approach that allows for direct collaboration with select states or even the United States. This factor makes the recent British Columbia venture with the WCI states particularly noteworthy, as it commits the province to move beyond its failed PERT (program evaluation and review technique) program of the past decade and begin to seriously enter into a regional agreement that will include some emphasis on emissions trading to achieve common reduction goals. Another exception may involve the Canadian federal government's March 2008 "Turning the Corner" strategy, which includes a general commitment to "setting up a carbon emissions trading market, including a carbon offset system" (Environment Canada 2008).

Where to Begin

Beyond emissions trading, some degree of collaboration might not prove to be so difficult in other policy areas likely to emerge to seek greenhouse gas reduction. Indeed, for all of the attention focused on cap-and-trade methods, any multi-level governance system is likely to employ some blend of policy tools, including forms of direct regulation. This is reflected, for example, in the American federal decision in December 2007 to mandate increases in vehicular fuel economy over the next decade. This could go even further if the president grants California and more than a dozen other states their request for a waiver to establish more stringent regulatory standards on carbon emissions from vehicles. Even in the European Union, where the ETS has received so much attention, far less than half of the continental reductions required under the first round of Kyoto that runs through 2012 will be achieved through this emissions trading regime. Indeed, even the 2008 proposals emanating from Brussels call for an expanded (and, hopefully, more functional) ETS to only address between 40-to-45 percent of emission reductions targeted for the next round. The remaining reductions will be delegated to individual member-states, which are free to pursue any menu of policies as long as reductions are achieved. A similar dynamic is evident in other federated systems, such as Australia and New Zealand, and also likely applies to Canada and the United States over the next decade. Consequently, climate policy between these North American neighbors may indeed involve varying degrees of reliance on emissions trading but are also likely to feature a confluence of other policies, including renewable portfolio and fuel standards among many others.

It is also possible that one or both nations, or sets of subnational units, may heed the advice of a growing chorus of climate scholars in both nations and place at least some of the burden of greenhouse gas reduction upon direct taxation of the carbon content in energy derived from fossil fuels. Ironically, a diverse set of climate policy analysts in both nations, from diverse ideological perspectives, have increasingly converged on this tool. Such proponents contend that it would produce direct incentives to reduce energy consumption, negate the need for complex regulatory systems, and likely generate substantial revenue that could be used either to support transition to cleaner energy sources or reduce other types of tax burdens. Such scholars, ranging from Gregory Mankiw at Harvard to Marc Jaccard at Simon Fraser, have been churning out papers and blogs on this topic and may actually be beginning to have some influence, reflected in the British Columbia case and some American cities such as New York City, San Francisco, and Boulder as they begin to move in this direction. There are, of course, enormous political impediments to full development of this approach, particularly in its explicit imposition of costs which can more easily be obscured through regulatory and subsidy programs. But the very consideration of a carbon tax approach offers a much easier path to cross-border collaboration, given the reduced complexity of such a policy and the option whereby neighboring jurisdictions could set similar policies so as not to discriminate against energy generated or sold in a particular jurisdiction. In turn, imposing a clear increase in the price of carbon-generated energy also would create a tremendous stimulus for governments and private entities to find ways to use energy more efficiently or develop non-carbon sources, thereby accelerating the use of other policies that might be easier to establish across federal and subfederal-level governmental boundaries.

Experiences from the European Union suggest that the transition to a more coordinated approach to climate change, whether through carbon taxation, emissions trading, or other tools, is not easy politically nor managerially (Cass 2006). But the EU offers numerous lessons whereby cross-national cooperation has begun to increase, especially in the electricity sector where individual nations have historically protected (and, in some instances, continue to own) large entities that dominate that sector and have little cross-border experience. Some scholars characterize even early episodes, such as setbacks in ETS implementation, as learning experience in a complex arena that could easily lead to more parsimonious outcomes through policy learning and incremental reform (Ellerman, et al. 2008). As with the WCI experiment, some neighboring EU Member States within the larger system are establishing common strategies in select areas such as development of renewable energy and energy efficiency.

Perhaps a more apt comparison to the Canadian-American relationship involves the burgeoning partnership between New Zealand and Australia on climate. These neighbors have long struggled with asymmetries similar to their North American counterparts. In turn, both have struggled to develop effective climate policies,

reflected in rates of greenhouse gas emissions growth that are at least double those of Canada and the United States since 1990. However, both nations have begun to take significant steps toward collaboration in the past two years, while maintaining national differences. New Zealand has developed a cap-and-trade system with broad inclusion of emission sources, while Australia is now building on significant state innovation to consider new national policies. Both nations have begun an active process of exploring ways in which they might cooperate on this issue, both to achieve emissions reductions at the lowest possible cost and also possibly to emerge as an Asian regional leader in the development and dissemination of climate-friendly technologies. As in the European case, there may be lessons in this relationship for any future development of Canadian and American collaboration on climate change.

There are, in turn, important short-term steps that Canada and the United States (or clusters of provinces and states) might take in the interim, perhaps in concert with Mexico. These may be less-glamorous than movement toward a full-blown cap-and-trade system and yet could represent essential components of any future climate policy. This might begin with common metrics, namely a reporting system for carbon dioxide and related greenhouse gas emissions from major sources. Ironically, the technical process for measuring emissions is relatively straightforward in most instances, usually a simple algorithm applied to fossil fuel consumption. But, to this point, most of the numbers used to calculate emission levels are estimates and projections rather than having a basis in formal and systematic disclosure and reporting systems. This is an area in which the Commission on Environmental Cooperation has played a significant role in attempting to systematize these data and provide similar inventories for conventional emissions inventories for all three nations, although it has not been involved thus far in greenhouse gas emissions.

Nearly 40 states have been involved in extended negotiations to establish some common system for disclosure and development of a common registry, although this has yet to reach any final agreements. It would be quite easy to expand this to include provinces. Canada and Mexico have begun to develop reporting systems, but these too remain in very early stages. This could evolve into an area in which all three federal governments or even the CEC could enter into this process and attempt to establish a unified reporting regime. Aside from the possible embarrassment to firms that would face public disclosure of their carbon emissions, this might provide the first common metric on greenhouse gas emissions in the world. Indeed, one of the key stumbling blocks to the first round of EU ETS implementation was the rush to construct a continental cap-and-trade system before any systematic program of emissions reporting among parties covered under the cap was in place. There remain doubts as to how far the EU has progressed in this regard and Canada and the United States have a clear opportunity to take a lead role in designing a system that provides transparent and reliable data to consider any future policies.

> The carbon tax approach offers a much easier path to cross-border collaboration, given its simplicity and transparency.

Such a starting point might lead to further areas where collaboration was indeed feasible. As more states and provinces consider, for example, RPS and related policies to promote renewable energy, some important initial steps could dramatically ease the transition toward expanded use of these alternative energy sources. These could include common definitions of what did (and did not) constitute renewable energy and how to define and measure credits from large and small renewable production sources that could indeed be used to meet various jurisdiction policies. As with the emissions reporting approach, common definitions and metrics could serve to provide a consistency that is currently absent among states and provinces. This would reflect the fact that electricity and energy distribution is not sealed at the 49th parallel and recognize that some basic infrastructure needs to be put into operation if future policy is to be credible and effective.

Of course, all of this could coincide with construction of parallel but interactive carbon cap and trade systems by the respective federal governments. Thus far, American proposals have the greatest specificity, reflected in iterations of the proposed American Climate and Energy Security Act. But these appear to parallel the broad direction Canada is considering through its evolving Turning the Corner proposal. Carbon cap and trade programs, as discussed, remain incredibly complex, largely untested, and subject to tremendous political pressures (Rabe 2008a). The possible parallel development of such systems or even comparable forms of carbon taxation, however, presents a unique opportunity for both nations to consider whether they prefer climate policies that are interactive and follow the flow of energy and commerce or are hermetically sealed from each other. In this case, it becomes crucial to allow for serious interaction between government departments or ministries charged with environmental protection and energy. Despite traditional divides and rivalries between these entities, experiments such as the American RGGI have been reasonably successful in this regard. Cross-border collaboration of officials with comparable portfolios might be achieved through comparable integrative mechanisms, perhaps compatible with the kind of cross-unit interaction envisioned by the Security and Prosperity Partnership of North America (Craik and DiMento 2008).

In many respects, these kinds of steps have parallels to the development of trade relationships, both involving Canada and the United States but even international institutions such as the World Trade Organization. Just as bilateral trade relations between Canada and the United States evolved over many decades, and later expanded to formally engage Mexico in the 1990s, the WTO emerged over two generations. It was built in an incremental fashion and still recognizes substantial differences by sector, nation, and continent. Many national and multinational entities played some role in a gradual shift from a very loosely-coordinated system of international trade into the current mechanism that blends national, regional, and international authority. The WTO faces numerous limits and continues to be the focus of considerable criticism. But it has succeeded in reducing some rigid barriers to cross-national collaboration that once seemed insurmountable and may pose some useful models for climate policy (Victor 2004).

Of course, in many respects, climate change is infinitely more complex than trade, cutting across virtually all arenas of public policy and clearly demonstrating the limits of unilateral action. But whereas a decade ago, scholars anticipated a rapid march to a binding international governance mechanism, it has become increasingly evident that climate policy will continue to involve some blending of activity that cuts across essentially every level of government in every nation. After a flurry of experimentation and innovation in some Canadian and American jurisdictions, most notably American states, questions emerge about the effectiveness of sustaining such a patchwork quilt, especially given the extraordinary degree of economic and energy interdependence among states, provinces, and these two neighboring nations. Twenty years ago at Toronto, Canada and the United States seemed poised to lead the world, much as they did in securing the transition to economies more friendly to a rapidly-depleting ozone layer. But aside from a significant subset of American states, it is virtually impossible to argue that either nation has begun to deliver on those earlier promises or seized the opportunities to lead a transition to a more climate-friendly economy. This paper concludes that there remain numerous institutional impediments to either unilateral or collaborative policy development. But the case for collaboration remains strong, perhaps beginning with steps to establish an infrastructure that can gather reliable data and bring together diverse policy professionals to maximize the likelihood that any future policy will be credible and effective.

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Chapter 13: The Next Century of Transboundary Environmental Governance

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The century-old Boundary Waters Treaty was signed against a relatively "uncluttered" bureaucratic landscape. There were no existing institutions to accomplish the same tasks and the uncomplicated agenda focused exclusively on irrigation, navigation and potable water supply—a far cry from the complexity of today's transboundary issues issues concerned with renewable energy, survival of fisheries, biodiversity, and the potentially vast and far-reaching consequences of global climate change. While some visionaries, founder Elihu Root among them, may have expected the treaty and the International Joint Commission (IJC) to address a broader transboundary agenda, this has not come to pass. Today, the visibility and influence of the IJC may be at an all-time low. Rather than attempt to revive them, this author suggests the time is ripe to build on the widespread, deeply-rooted public concern with environmental matters to create an institution with a more comprehensive scope. Such an institution might study, consult and make recommendations to both governments on any and all matters connected with cross-border environmental issues, and be linked with the legislative branches of government through reporting mechanisms similar to those of the Canadian Auditor-General and the U.S. General Accounting Office. However, its success or failure might rest on several factors, the author warns, including the high public stature and caliber of its members, and that it not take away from the important purposes and activities of a proliferation of subnational governance arrangements and cooperative agreements that have arisen in recent decades to deal with transboundary environmental issues.

A century after the signing of the Boundary Waters Treaty the landscape of environmental governance has been transformed dramatically. Irrigation, navigation and hydration (potable water) comprised the agenda of water management 100 years ago. They continue to be on the agenda, but these transboundary issues have been joined by concerns over power generation, invasive species, lake levels, recreational and commercial fishing, native rights, water exports and the potentially vast and far-reaching effects of climate change. Had the agenda of transboundary water management been this broad and complicated when American and Canadian negotiators sat down to talk about a binational institutional framework for their resolution, it is a fair bet the Boundary Waters Treaty and the International Joint Commission (IJC) would never have seen the light of day.

To an important degree it was probably the uncluttered state of both the water management agenda and the near absence of structures

to deal with these issues that provided the opportunity to create a treaty as ambitious as the Boundary Waters Treaty—an "uncommonly good treaty," as James Bryce, British Ambassador to the United States, described it—and an institution as novel as the IJC. This is not to suggest that water management, let alone the management of water resources shared across the Canada-U.S. border, was a simple matter when the treaty was signed. The old adage, "Whiskey is for drinkin' and water is for fightin' over," expressed the high stakes associated with the management of scarce water resources. But doing new things and thinking in novel ways is generally more difficult when old ways already exist. In the case of transboundary water management, the old ways consisted of ad hoc negotiations around specific issues as these arose, without there being any stable institutional architecture for the monitoring, study and resolution of these matters. There were, in short, no entrenched bureaucratic interests, no administrators with line items and program budgets to defend and no deeply cut neural pathways to channel thinking about how to manage these issues.

But there were governments: governments with sometimes opposing interests tied to the communities and groups on their respective sides of the border. As population, industry and agriculture increased and intensified in the Great Lakes region and along the common watersheds that cross the Canada-U.S. border, there were increases in both the frequency of conflict and the stakes involved. The institutional setting for the management of these issues was not a tabula rasa. On the American side, the Department of the Interior, the State Department and the Army Corps of Engineers already were part of this policy community; in Canada, the federal Department of Interior and the Department of External Affairs were the lead agencies on transboundary waster issues. But there was enough fluidity in the governance process that new models were not ruled out by entrenched institutional interests.

A relative absence of institutional barriers to innovation would not have been sufficient without new ways of thinking about transboundary water management. These ideas took a couple of forms. One involved the Progressive movement's faith in governmental solutions to policy problems. The administration of Theodore Roosevelt was a long way from interventionist by today's standards. But in the context of his times Roosevelt presided over some major reforms in public policy and, more to the point, shared the Progressive belief that experts could arrive at solutions to problems whose nature was essentially technical. Roosevelt's strong belief in the ethic of conservationism, rooted in his lifelong appreciation and respect for the natural world, was probably another factor that helped create the intellectual space during his presidency for the idea of binational management of water resources.

As the weaker partner in this asymmetrical relationship, Canada had everything to gain and nothing to lose from a treaty and a new institution, the IJC, that were premised on the equal say of the two countries in the management of their shared water resources. Canadian foreign affairs were still mainly and formally managed by the British at this point in time. However, the leading Canadian negotiator, George Gibbons, shared with U.S. Secretary of State Elihu Root an optimistic conviction that the Boundary Waters Treaty and the IJC represented a visionary and workable model for the resolution of transboundary water issues. Consequently, the treaty contained the ideas of those who negotiated on Canada's behalf and the governments they represented.

This model was perhaps only achievable at that point in Canada-U.S. relations. The institutions, individuals, ideas and interests came together in a felicitous configuration that allowed for innovation. The governance model embodied in the Boundary Waters Treaty and the IJC represents a classic example of a hard law solution to a policy problem: a treaty that creates formal obligations for both parties, establishes a decision-making institution and assigns it powers that include, formally at least, the power to impose binding rulings on both national governments. The model was solidly in the Madisonian tradition of relying on structures and formal agreements to achieve outcomes that the goodwill and sense of fairness of the parties could not be counted on to accomplish.

And yet, for this model to work, the governments that created it had to be willing to permit the treaty and the IJC to occupy center stage in managing transboundary water issues. This would have required a major investment of status and resources in the IJC, investments that have in fact been comparatively meager over its history and certainly insufficient for it to play this sort of leading role. It would also have required governmental willingness to use the IJC when the stakes were high. With rare exceptions this has not been the case and, indeed, the involvement of the IJC in high-stakes transboundary conflicts actually appears to have declined over time.

From today's abundantly more complicated perspec-

tive, the Madisonian model of governance seems to have been too rigid and also too centralized to fit the circumstances of transboundary water management. Moreover, the political and economic stakes on both sides of the border proved to be too high for the Canadian and U.S. governments to empower the IJC to play a dominant role. This was especially true for the United States, given that it had the least to gain and potentially the most to lose from the binational equality formula in IJC decision making. But several other factors contributed to the development of transboundary environmental governance and the processes and structure through which it operates. One of these was precisely the broadening and transformation of the original issue agenda, which had been only about water management, into a much more complicated agenda of environmental governance. It was always highly improbable that this expanding set of new issues would be funnelled through the IJC, notwithstanding that the commission's enabling legislation explicitly states that virtually any cross-border issue may be referred to it by the national governments.

The border that separates Canada from the United States also marks a line of jurisdiction between provinces and states and between communities. Issues involving water supply and quality, recreational and commercial uses of shared water resources, and the generation and transmission of electrical power are of interest to state, provincial and local governments. Indeed, much of the authority in regard to such matters is not at the national level, but at the subnational level of governments that treat sewage, operate water systems, regulate hydroelectricity and other forms of power generation, issue commercial and recreational fishing and boating licenses and have the power to pass laws affecting the behavior of polluters. Also on both sides of the border, native communities and their governments have asserted their rights to be involved in decision making on these matters, and their point of view has been increasingly accepted over the last few decades. The centralized nature of the model embodied in the Boundary Waters Treaty and the IJC was not able to accommodate the decentralized reality of the environmental governance agenda and the extensive involvement of subnational governments in the process of managing transboundary environmental issues.

The involvement of these subnational governments is only partially due to the limits of nation-to-nation structures and processes for managing the issues, however. More important has been the fact that much of the authority for these issues rests at the level of local and state and provincial governments. The interests and communities that are most immediately affected also tend to be local or regional and the causes of transboundary issues also are often within the immediately affected area, as may be true of a dam or other water diversion or of point-source pollution. This is not always the case, of course. Invasive species and lake levels are examples of issues where the causes lie outside a region and typically are beyond the control of subnational authorities. But to summarize, the proliferation of decentralized governance models is perhaps best explained by the transboundary nature of the issue, the motivations for local and regional actors to become involved, and the fact that both the Canadian and American political systems empower subnational governments to enact a large range of policy measures that stop short of the hard law of nation-to-nation treaties.

Viewed this way, it was probably inevitable that the Boundary Waters Treaty and the IJC centralized governance model launched a century ago would by now be submerged under a wave of subnational agreements and cooperation through regional networks and local linkages. It does not mean that there is no place for the IJC and a more comprehensive approach to transboundary environmental governance, but it does strongly suggest that there are serious limitations to the effectiveness of this model. Indeed, some of the participants at the Wilson Center conference where the chapters of this book were first presented expressed doubts whether the decentralized model and reliance on soft law have the capacity to deal with such issues as the impact of climate change on water levels and supply, water takings in response to the needs of populations far from the Canada-U.S. border, and the weaning of cross-border electricity grids from carbon dioxide-generating energy sources to renewable ones.

In the end, the real question is not whether the Madisonian model of centralized decision making based on hard law, or the decentralized, subnational, soft-law model, works better. Rather, the challenge involves striking the right balance between these models in creating the institutional architecture for environmental governance. Therefore, as we move into the second century of transboundary environmental governance between Canada and the United States, it is an opportune moment to reflect on which models appear to work or not work, as the case may be, in other parts of the world

that face similar challenges.

The European Union (EU) is an obvious starting point. Indeed the complexity of the environmental governance issues facing European governments has long been quite staggering. The continent's major rivers, the Rhine and the Danube, run through six and 13 countries, respectively, and their basins encompassing an even greater number of countries. The externalities created by one country's industries, water and sewage practices, and energy generation systems, whose consequences spill over national borders, have long existed. However, until fairly recently, there did not exist any centralized architecture for monitoring, studying and regulating these matters. The Environment Directorate-General of the European Union now establishes binding standards and rules that member-states must meet, but national compliance is spotty.

Effectiveness aside, the EU's centralized model for transboundary environmental governance is the product of circumstances that are quite different from those that exist between Canada and the United States. The EU has under its belt several decades of supranational governance and an elaborate and specialized bureaucracy for managing issues that cut across the borders of member-states. Having 27 national parties to negotiations and rule making might appear to make consensus more difficult to achieve than when there are only two, but the fact that the EU member-states participate within a system of binding rule making whose terms of membership already dilute their national sovereignty probably makes agreement more achievable among them than between Canada and the United States. However, this would not be true were it not also the case that the institutions of the EU have status and authority in the eyes of policy makers and groups in civil society throughout Europe.

This is not to suggest that many national and subnational governments are not frequently critical of the EU and its rules and skeptical about the centralization of policy making in Brussels. The general cynicism of much of the European population is well known and was very clearly expressed in the 2005 rejection of the proposed EU constitution, followed by French voters' rejection of the proposal in 2006 and then Irish voters' 2008 rejection of the Lisbon Treaty. Nevertheless, the EU has very clearly established itself as a center of authority that rivals the national and subnational governments of member states and thus provides a sort of umbrella of legitimacy for transboundary environmental governance among its countries.

> "The IJC and the Boundary Waters Treaty are unlikely to be able to take the lead in the second century of transboundary environmental governance... politically more effective course of action might be to invest in an entirely new binational institution whose creation does not require a treaty and... whose formal powers do not appear to take anything from existing institutions.

Canada and the United States lack this sort of umbrella. The Boundary Waters Treaty was probably expected by some visionaries, Elihu Root among them, to provide a structure and process for a coordinated approach to water management, and conceivably other transboundary issues as well, but this has not come to pass. There is virtually nothing in the recent history of the IJC to suggest that the treaty and the Commission's role are likely to be reformed in significant ways. The last time the IJC acquired an expanded role was in 1978, under the Great Lakes Water Quality Agreement. Thirty years later, the visibility and influence of the IJC may well be at an all-time low.

The IJC and the Boundary Waters Treaty are unlikely to be able to take the lead in the second century

of transboundary environmental governance, and this may be partially explained by the association that is typically made in the minds of policy makers and the attentive public between the IJC and the Great Lakes, and the general perception that its role is limited to water. It is doubtful that either of these perceptions can be overcome. Instead of attempting to revive and reframe the treaty and the IJC, a politically more effective course of action might be to invest in an entirely new binational institution whose creation does not require a treaty and whose initial role and authority strike a balance between the prestige needed to ensure that its activities and pronouncements are taken seriously, but whose formal powers do not appear to take anything from existing institutions.

'Easier said than done!' is surely the reasonable response to this suggestion. The history of environmental policy is littered with institutions that failed to meet the grand expectations held for them at their creation. It may be, however, that we have arrived at a moment when it is possible for skillful policy entrepreneurship to build on the widespread, deeply-rooted public concern with environmental matters such as global climate change and its consequences, to create an institution whose scope would be more comprehensive than that which characterized the Boundary Waters Treaty-IJC model in the first century of transboundary environmental governance. Such an institution might be assigned a broad mandate to study, consult and make recommendations to both governments on any and all matters connected with cross-border environmental issues. But as attractive as this prospect is, such an institution would be doomed to inevitable marginalization and failure unless certain conditions are satisfied. One of these would have to be the public stature of its members. Both Canada and the United States would have to select representatives of cabinet-level caliber, people whose public or professional careers establish their credibility and thus contribute to the prestige and visibility of this institution. Another condition might be to link this binational institution to the legislative branches of government through such mechanisms as the Canadian Auditor-General's and the U.S. General Accounting Office's reports to the legislatures of their respective countries. An environmental commissioner reporting annually to the House of Commons and the U.S. Congress, delivering simultaneous reports that include both matters of agreement and disagreement between them, would be likely to generate far more public and legislative interest than the annual reports and occasional special studies and recommendations of the IJC.

However, there is still no guarantee that a newly created institution along the lines described above, or structured in some other manner, will make the least bit of difference in terms of environmental outcomes. North America is not Europe and there are many reasons to believe that the centralized model that is being constructed as part of the larger process of EU integration is unlikely to find widespread acceptance here. And, conversely, even if a new institution were to be created and were to achieve a level of visibility and influence far beyond what the IJC was capable of during the last century of environmental governance, this would not diminish the importance of the subnational governance arrangements that have proliferated in recent decades. But as many of the preceding chapters have demonstrated, much of the agenda of transboundary environmental governance between Canada and the United States arises from causes whose roots are not local and which cannot be dealt with through processes and agreements that are not commensurate with their true causes. There is, in short, a need for institutions and processes that are more comprehensive to complement the important and necessary work of local and regional cooperation across the border. The first century of transboundary environmental governance failed to produce such institutions and processes. The challenge of the second century is to rectify this failure and expand our capacity to respond to what are now some of the most pressing challenges facing our shared continent.

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