

Towards Cross-Border Environmental Policy Spaces in North America: Province-State Linkages on the Canada-U.S. Border

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In the post-NAFTA era, rising awareness of the transboundary nature of most environmental threats and concerns about trade-induced degradation in North America have focused attention to a greater extent on degradation in border environments and the governance arrangements necessary for responding to this degradation. While the roles of national governments, private and nongovernmental actors are certainly being considered vis-à-vis existing and new governance arrangements, subnational governments have achieved particular prominence in such discussions. In fact, on the Canada-U.S. border, it is argued that states and provinces, acting through cross-border cooperative mechanisms, are now the primary locus of environmental policy initiative and innovation to address shared problems. Furthermore, these actors have become a key – perhaps *the* key – component of the Canada-U.S. environmental relationship.

Indeed, a growing number of case studies have painted a picture of a burgeoning network of subnational and cross-border regional environmental linkages along the Canada-United States border. In addition to increasing in number, this literature suggests that cross-border interactions have become more formalized, more functionally intense and increasingly multilateral, or regional, in orientation. However, there have been very few comprehensive studies on the nature of these linkages, or how networks of linkages in different cross-border regions compare to one another. Given the rising importance of states and provinces as transboundary environmental actors, more detailed information is necessary.

As a first step in bridging this knowledge gap, this paper reports the findings of a 2005 survey of cross-border environmental linkages along the Canada-U.S. border. This study measures the *density* of cross-border environmental linkages between individual state-province pairs, both in terms of the extent (number) of ties but also longevity and functional intensity (measured on a spectrum of functions ranging from information sharing and consultation to more ambitious activities such as cooperation, harmonization and even integration). Overall, the study found that subnational and regional interactions have been institutionally and functionally ‘intact’ for longer than most observers of Canada-U.S. environmental relations might expect. One of the most interesting findings of this study is that subnational and regional cross-border environmental linkages, contrary to conventional wisdom, have become more numerous over time but not necessarily more intense in functional terms.

Moreover, as expected, environmental linkages are clearly regionally concentrated. Clusters of highly linked states and provinces can be found along the Canada-U.S. border, particularly in New England, the Great Lakes and the Pacific Northwest. However, defining the exact boundaries of environmental regions is a difficult task. Subnational cross-border environmental interactions are characterized by complex networks of overlapping relationships which themselves vary in their extent and intensity. These networks comprise particular state-province pairs which may act as a key component – or, in some cases, the anchor – for regional clusters of subnational cooperation involving core states and provinces. These main clusters can also radiate influence outward to draw in other states and provinces for particular purposes.

This study also sheds some light on the nature of particular regions. New England is multilateral in orientation, with linkages well established (half by the 1980s) and focused primarily on cooperation and harmonization. The Great Lakes region is also well established, exhibits a balance between bilateral and multilateral interaction, and has shown more consistent activity in terms of building new linkages over the time period under study. Linkages in this region span the spectrum in terms of functional intensity. The Pacific

Northwest is more recently institutionalized and largely cooperative; a strong British Columbia-Washington state bilateral relationship anchors a broader region that also exhibits some multilateral activity. The Plains/Central region is the least cohesive of all regions and one might hesitate to call it an environmental region at all.

Cross-Border Regions and the Canada-U.S. Environmental Relationship

Not until recently have states and provinces occupied a prominent place in studies of the Canada-U.S. environmental relationship. Early perspectives on the relationship from the 1970s through to the early 1990s viewed environmental interactions through the lenses of bilateralism, diplomacy and territorial maintenance. As Maxwell Cohen noted in 1983: “Canada and the United States occupy and inevitably have to jointly manage a vast continental region ... some five thousand miles of boundary [that] are the major fact of sovereign life for both countries.”¹ John Carroll, in setting out the framework for his ground-breaking volume – the first comprehensive, cross-case analysis of Canadian-American environmental relations, entitled *Environmental Diplomacy* – explained that he would deal with “bilateral issues,” by which he meant “any project or undertaking representing a benefit to one country and a cost to another and concerning which the latter raises objection.”² The cases examined in the book were in fact chosen due to their “diplomatic importance and relevance to the overall bilateral relationship.”³ In their detailed analyses of the development of Great Lakes pollution and acid rain regimes, Don Munton and Geoffrey Castle concluded that, “[t]hough both Canada and the United States still enjoy legal sovereignty and substantial political autonomy in formulating their environmental policies, ... the structures within which they operate are, increasingly, artifices of the emerging bilateral regime.”⁴

Such analyses necessarily privileged national-level actors. Carroll took the approach that, “[s]ince only governmental officials at the federal levels in both countries are constitutionally authorized to negotiate or make decisions in this area, these federal actors are naturally the central focus of attention.”⁵ The U.S. states, according to Carroll, “are not accustomed to dealing across international borders. Thus they have little history and little expertise in this area.”⁶ Even though he observed that the power of the provinces had “increased immeasurably,”⁷ Carroll argued that the role played by provinces as well as states was oriented “internally in influencing their respective national governments” rather than in any direct cross-border capacity.⁸ He also emphasized the “constitutional and legislative obstacles” that existed in both countries to the conduct of foreign relations by subnational governments. Schmandt and Roderick, in their exhaustive study of the acid rain

¹ Maxwell Cohen, Preface to John E. Carroll, *Environmental Diplomacy: An Examination and a Prospective of Canadian-U.S. Transboundary Environmental Relations*. Ann Arbor: The University of Michigan Press, 1983, p.ix.

² John E. Carroll, *Environmental Diplomacy: An Examination and a Prospective of Canadian-U.S. Transboundary Environmental Relations*. Ann Arbor: The University of Michigan Press, 1983, p.5.

³ John E. Carroll, *Environmental Diplomacy*, 3.

⁴ Don Munton and Geoffrey Castle, “Air, Water and Political Fire: Building a North American Environmental Regime,” in A. Claire Cutler and M.W. Zacher, eds., *Canadian Foreign Policy and International Economic Regimes*. (Vancouver: UBC Press, 1992), p.333.

⁵ John E. Carroll, *Environmental Diplomacy*, 5.

⁶ *Ibid.*, p.17.

⁷ *Ibid.*, p.13.

⁸ *Ibid.*, p.286.

debate, acknowledged the growing role of subnational governments in transboundary air pollution control, especially in terms of establishing “an infrastructure of cooperation between the governments,” and noted that states and provinces were increasingly taking the initiative and dealing directly with one another. However, these activities were deemed to be “of minor constitutional significance” and the authors concluded that, “the key question is to what extent the federal governments of the United States and Canada can formulate sound policies to control acid rain under conditions of uncertainty.”⁹ Munton and Castle, in their analyses of Canada-U.S. negotiations on both the 1972 *Great Lakes Water Quality Agreement* (revised in 1978) and the 1991 *Air Quality Agreement*, portrayed federal officials as the primary actors, shuttling back and forth between American and provincial officials in order to cement a deal. Alison Reiser, Judith Spiller and David VanderZwaag noted in their study of tidal energy development in the Bay of Fundy - Gulf of Maine region that “[s]tate-provincial cooperation in environmental protection is not an unusual occurrence in U.S.-Canadian relations” but they foresaw national rather than subnational action oriented toward resolving friction in their region.¹⁰

The lack of attention to the role of provinces and states in transboundary environmental matters relative to that of national governments during this period was not surprising and can be attributed to a number of factors. The first was the continued pre-eminence at that time of the nation-state in social scientific thought, and particularly among the international relations analysts who dominated the study of the Canada-U.S. relationship. It was not until the mid-1990s that scholars such as Jessica Matthews and, in the Canadian context, David Cameron and Janice Gross Stein were noting a significant change in governance structures in North America and elsewhere in response to globalizing forces, specifically in terms of what these analysts described as a ‘bleeding’ of traditional state authority upward to supra-state, downward to sub-state and outward to non-state actors.¹¹ In addition, the environmental issues under active consideration in the 1970s and 1980s, particularly acid rain, had contributed to something of a diplomatic crisis between the two countries, necessitating interaction and focus at the highest levels. Schmandt and Roderick claimed with respect to the acid rain controversy that, “both sides must recognize that the dispute affects the entire range of U.S.-Canadian relations. Leaving this issue unresolved will eventually lead to the deterioration of bilateral relations in other areas.”¹² Indeed, commentators viewed the acid rain issue as contributing to “particularly strained” relations between the two countries¹³ and as bringing the U.S.-Canada relationship “to [its] lowest point in decades.”¹⁴ Moreover, by the 1980s, the International Joint Commission, the most important Canada-U.S. binational institution, was garnering considerable attention at the highest levels especially on the American side and largely because it had come to be viewed as a threat to national sovereignty, an organization which needed to be ‘reined in.’¹⁵

⁹ Jurgen Schmandt and Hilliard Roderick, *Acid Rain and Friendly Neighbours: The Policy Dispute between Canada and the United States*. (Durham: Duke University Press, 1985), 26, 232, 240.

¹⁰ Alison Reiser, Judith Spiller and David VanderZwaag, *Environmental Decisionmaking in a Transboundary Region*. (Berlin: Springer Verlag, 1986), p.172-3.

¹¹ Jessica Matthews, “Power Shift” *Foreign Affairs* 76 no.1 (January/February 1997): 50-66; Cameron, D. and J. Gross Stein, “Globalization, Culture and Society: The State Amidst Shifting Places” *Canadian Public Policy* 26 s.2 (August 2000): 15-34.

¹² Jurgen Schmandt and Hilliard Roderick, *Acid Rain and Friendly Neighbours: The Policy Dispute between Canada and the United States*. (Durham: Duke University Press, 1985), 76.

¹³ Alison Reiser, “Introduction,” in Alison Reiser, Judith Spiller and David VanderZwaag, *Environmental Decisionmaking in a Transboundary Region*. (Berlin: Springer Verlag, 1986), p.xii.

¹⁴ *Ibid.*, p.216.

¹⁵ Don Munton and Geoffrey Castle, “Air, Water and Political Fire,” 316-317.

Subnational cross-border activity was certainly present prior to 1990, though relatively underdeveloped, and this activity was beginning to attract scholarly attention. Roger Frank Swanson undertook the first comprehensive study of interactions between states and provinces in 1976 and found that such contacts numbered over 700. These interactions were, however, largely informal.¹⁶ Proceedings of a University of Alberta Conference on “The Provinces and Foreign Policy” in the mid-1980s declared that “[p]roximity and geography have also been instrumental in the development of extensive relations between Canadian provinces and American states.”¹⁷ Specifically in the environmental realm, Robert Stein and Geoffrey Grenville-Wood, in their 1984 study *Between Neighbors: How U.S States and Canadian Provinces Settle Their Shared Environmental Problems*, began by observing that “contacts between states and provinces concerning environmental and natural resource issues are becoming more numerous.”¹⁸ The authors provided an accounting of both formal and informal interactions, emphasizing that “state and provincial officials are just a phone call away and in an area such as the environment there is a great deal of liaison at the technical level.”¹⁹

In the post-NAFTA era, rising awareness of the transboundary nature of most environmental threats and concerns about trade-induced degradation in North America have focused attention more than ever before on border environments. Simultaneously, in both Canada and the U.S. an upsurge of environmental policy research has been animated by a concern that the federal government is no longer (as in the U.S.) or has never really been (as in Canada) the primary environmental innovator. Whether because of constitutional, political or financial constraints on federal actors, the focus has shifted to state and provincial governments, whose capacity to address environmental challenges has grown particularly since the late 1980s and who have exhibited a willingness to innovate at home. Canadian provinces already control the most important constitutional and policy levers to address environmental protection and natural resource matters, while the involvement of U.S. states in environmental protection activities has increased significantly, to the point where they are the primary implementers and enforcers.²⁰ Studies also have demonstrated a willingness on the part of states to undertake innovations in terms of environmental policy approaches and instruments, particularly in the Northeast and Pacific Northwest.²¹ Individual provinces, for their part, show signs of innovativeness on particular

¹⁶ Roger Frank Swanson, “The U.S.-Canada Relationship at the State/Provincial Level: A U.S. Perspective.” University of Manitoba: The Natural Resource Institute, 1976.

¹⁷ Tom Keating and Don Munton, eds., *The Provinces and Canadian Foreign Policy*. Proceedings of a Conference, University of Alberta, Edmonton, AB, March 28-30 1985. (Toronto: Canadian Institute of International Affairs, 1985), p.vii.

¹⁸ R.E. Stein and G.Grenville-Wood, *Between Neighbours: How U.S. States and Canadian Provinces Settle their Shared Environmental Problems* (Ottawa and Washington: Environmental Mediation International, 1984), 2.

¹⁹ R.E. Stein and G.Grenville-Wood, *Between Neighbours*, p.

²⁰ A review of state environmental activities completed by the Environmental Council of the States over the period 1986-98 found that the state (vs. federal) share of total environmental expenditures increased from 42% to 80% and that the number of state environmental staff had increased by 60%. A 2001 study, also by ECOS, also indicated that 90% all environmental enforcement actions were being taken by the states.

²¹ See, for example: Barry G. Rabe, “Permitting, Prevention, and Integration: Lessons from the States,” in Donald F. Kettl, eds., *Environmental Governance: A Report on the Next Generation of Environmental Policy*. (Washington, DC: Brookings Institution Press, 2002), pp.14-57; Lia Parisien and Adam Wollenberg, “State Environmental Innovations 2000-2001,” Washington, DC: Environmental Council of the States, June 15, 2001; Scott P. Hays, Michael Esler and Carole E. Hays, “Environmental Commitment among the States: Integrating Alternative Approaches to State Environmental Policy,” *Publius: The Journal of Federalism* 26 no.2 (Spring 1996): 41-58; Michael E. Kraft and Denise Scheberle, “Environmental Federalism at Decade’s End: New Approaches and Strategies,” *Publius: The Journal of Federalism* 28 no.1 (Winter 1998): 131-146; Alfred A. Marcus, Donald A. Geffen, and Ken Sexton, *Reinventing Environmental Regulation: Lessons from Project XL*. (Washington, DC: Resources for the Future Press, 2002).

environmental issues; Manitoba is shaping up as an innovator with respect to greenhouse gas reduction, Nova Scotia is on the cutting edge with respect to solid waste management, and British Columbia has been a leader on both solid waste reduction and air quality.

At the same time that states and provinces are gaining more policy latitude and innovating within their own intergovernmental contexts, they have been interacting more frequently with one another across the international border – and particularly in the environmental sphere. National governments have undertaken little in the way of new initiatives over the past decade, aside from updates/additions to existing bilateral agreements such as the Canada-United States Air Quality Agreement²² and MOUs for research collaboration and information sharing.²³ At the subnational and cross-border regional level, however, there have been numerous institutional and policy innovations. One of the oldest cross-border regional mechanisms, the Conference of New England Governors/Eastern Canadian Premiers (NEG/ECP), considers itself “a forceful advocate of environmental issues and sustainable development”²⁴ and it has acted before federal governments on a succession of air quality issues, utilizing its own cross-border committee system as well as a variety of linkages with research organizations, universities and governments.²⁵ The Great Lakes states and provinces have moved ahead of the two federal governments in attempting to establish a basin-wide agreement to stem the export of freshwater from the Lakes to continental and foreign markets, using the Great Lakes Commission and an annual conference of states and provinces as planning platforms. In the Pacific Northwest, BC and Washington state have taken *preventive* measures to forestall the increase in air pollution expected under future population and economic growth scenarios, by bringing regional, subnational and federal officials together under one task force umbrella. Moreover, states and provinces all along the west coast, from California to Alaska have undertaken a collaborative program to reduce diesel emissions. This “West Coast Initiative” targets sources of diesel pollution bombarding the region, including long-haul trucks, cargo ships as well as farm and construction equipment.

Perhaps no other issue is as illustrative of the innovative power of subnational and cross-border regional cooperation as climate change. The most ambitious initiative has originated with the NEG/ECP, which has adopted a transboundary Climate Change Action Plan committing its members to reduce greenhouse gas (GHG) emissions to 1990 levels by 2010, 10% below 1990 levels by 2020 and to ultimately decrease emissions to levels that do not pose a threat to the climate. Implementation is to include a cross-border GHG emissions trading regime, and planning for the regime will also include New York and New Jersey, not currently NEG/ECP members. Further west, the Dakotas, Iowa, Minnesota, Manitoba and Wisconsin have launched a Powering the Plains (PTP) initiative, which brings together top elected and government officials, utility industry executives, agricultural producers and renewable energy advocates “to develop and implement strategies,

²² An Ozone Annex was added to the 1991 Canada-United States Air Quality Agreement, and it is likely that negotiations on a Particulate Matter Annex will begin later in 2005.

²³ For example, in March 2002, the State Department and Environment Canada released a joint statement pledging expanded cooperation on climate-change projects. (U.S. State Department 2003) This initiative was to involve “many U.S. agencies and Canadian departments and agencies which are already engaged in this issue” and focus cooperation in such areas as the development of clean coal, carbon sequestration, co-generation and renewable technologies, as well as climate change science and research.

²⁴ U. Rausch, *The Potential of Transborder Cooperation: Still Worth Try*. (Halifax: Centre for Foreign Policy Studies, 1997), iii

²⁵ Debora L. VanNijnatten, “Analyzing the Canada-United States Environmental Relationship: A Multi-Faceted Approach,” *The American Review of Canadian Studies: Thomas O. Enders Biennial Issue on the State of the Canada-U.S. Relationship* 33 no.1 (Spring 2003): 93-120; Henrik Selin and Stacy D. VanDeveer, “Canadian-U.S. Environmental Cooperation: Transnational and Subnational Climate Change Action,” Paper presented to Authors’ Workshop, Thomas O. Enders-American review of Canadian Studies special issue on the Canadian-American Relationship, Washington, DC, November 2004.

policies, initiatives and projects in energy and agriculture that add value to the region's economy while reducing the risk of climate change and other environmental concerns.”²⁶ The PTP is working on an integrated energy strategy which builds on the region's comparative advantages in renewable and carbon-neutral technology and will develop policy recommendations for governments. In the Northwest, BC, Washington and Oregon are discussing integrated transportation systems as well as renewable energy generation. In 2000, a conference in Washington state resulted in the Seattle Summit Plan of Action which called for the US Pacific Northwest and British Columbia to become a leading ‘region’ for clean energy and contained initiatives for achieving this vision. One initiative is the formation of a “hydrogen highway” running from California to Canada along the west coast.

The burgeoning literature on subnational cross-border environmental interaction, including numerous case studies, suggests that these interactions have become more numerous, more formalized, more functionally intense and increasingly multilateral, or regional, in orientation over the past two decades or so. In the late - 1990s, a study by a Canada-U.S.-Mexico team conducted a survey of transboundary environmental agreements and found that, not only were state-province agreements becoming more numerous, they also had become increasingly formal, being based on written documents rather than implicit understandings or verbal commitments.²⁷ The North American Commission on Environmental Cooperation (CEC), which maintains an online database of transboundary agreements, provides further support for the presence of formal linkages at the subnational level.²⁸ The Canada-U.S.-Mexico study also found that more than half of the subnational agreements were multilateral and regional, involving more than two contiguous jurisdictions. Indeed, the case study literature indicates that multilateral, regional environmental cooperation is evident among Great Lakes states and provinces as well as in the Northeast and Pacific Northwest regions.²⁹

However, very few of the current studies of subnational and cross-border regional environmental interaction are comprehensive in nature; the Canada-U.S.-Mexico survey is now a decade old, and much has transpired in that decade. While the case study literature has shed considerable light on how particular pairs or groupings of subnational jurisdictions interact across the border, these studies utilize different methodologies to study different regions that are, in turn, addressing different environmental issues. Cross-regional analysis has

²⁶ Please see: Great Plains Institute, “Powering the Plains” Available at: <http://www.gpisd.net/resource.html?Id=61>

²⁷ Sanchez-Rodriguez, R.A., K. von Moltke, S. Mumme, J. Kirton, and D. Munton, “The Dynamics of Transboundary Environmental Agreements in North America” in R. Kiy and J.D. Wirth, eds. *Environmental Management on North America’s Borders*. (College Station: Texas A & M University Press, 1998) p.32-39.

²⁸ NACEC, Publications and Information Resources, Available at : http://www.cec.org/pubs_info_resources/law_treat_agree/transbound_agree/index.cfm?varlan=english

²⁹ See: J. Alley, “The British Columbia-Washington Environmental Cooperation Council: An Evolving Model of Canada-United States Interjurisdictional Cooperation,” Pp.53-71 in R. Kiy and J.D. Wirth, eds., *Environmental Management on North America’s Borders*. (College Station: Texas A & M University Press, 1998); D.K. Alper, “Transboundary Environmental Relations in British Columbia and the Pacific Northwest,” *The American Review of Canadian Studies - Red, White and Green: Canada-U.S. Environmental Relations* 27 no.3 (Autumn 1997): 359-384; D.K. Alper, “Emerging Collaborative Frameworks for Environmental Governance in the Georgia Basin/Puget Sound Ecosystem,” Paper presented to the Association of Borderland Studies, Las Vegas, Nevada, April 2003; L.P. Hildebrand, V. Pebbles and D.A. Fraser, “Cooperative ecosystem management across the Canada-U.S. border: approaches and experiences of transboundary programs in the Gulf of Maine, Great Lakes and Georgia Basin/Puget Sound” *Ocean and Coastal Management* 45 (2002): 421-457; A. Springer, “North American Transjurisdictional Cooperation: The Gulf of Maine Council on the Marine Environment,” *Canadian-American Public Policy* (April 2002). Accessed at: <http://www.umaine.edu/canam/PublicPolicyJournal/titles.htm>.

rarely been attempted.³⁰ Yet, it critical that we acquire a deeper understanding of this development, both because networks of subnational and cross-border regional ties are now the primary locus of environmental policy initiative and innovation along the Canada-U.S. border³¹ and because this development may represent an evolution in governance arrangements such that cross-border environmental policy spaces are being created. The following section explores in greater detail the assumptions of the existing literature with regard to the extent and intensity of subnational activity by examining the findings of a 2005 survey of environmental linkages between states and provinces along the Canada-U.S. border.

Cross-Border Environmental Linkages

This study measures the *density* of cross-border environmental linkages between individual state-province pairs, both in terms of the number of ties but also longevity and functional intensity. A database of state-province ties was compiled and is current to October 15, 2005.³² Particular conditions were imposed for the inclusion of state-province linkages in the database. Swanson, whose 1976 study was the first comprehensive attempt to document the extent and nature of state-province interactions, stipulated that in order to be included in his study state-province interactions must be currently in operation, must involve direct communication and must be carried out on an ongoing basis.³³ Thus, ‘one-off’ interactions would not be included. We have adopted these and added two additional conditions for our 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. There are numerous examples, particularly in the Great Lakes basin, of cross-border organizational linkages which actively involve states and provinces, but are carried out under the auspices of the two federal governments, such as the Binational Toxics Strategy or the Great Lakes Fisheries Commission. Such federally-driven linkages are not included in the database. Further, we also included both ‘primary-level’ state-province linkages, such as the British Columbia-Washington Environmental Cooperation Council (ECC), and sub-linkages, such as the ECC’s Abbotsford-Sumas Task Force, where these have clearly taken on a “life of their own” in terms of institutionalization, membership, operating practices, resources and substantive focus. However, we were careful to avoid ‘double-counting’; for example, where an MOU has been signed between two agencies only to operationalize the mandate of a cross-border task force, rather than engage in new activities, this counts as one linkage, not two.

Swanson’s 1976 study identified 766 state-province interactions, of which fully 29% or 222 interactions

³⁰ One exception is the article: L.P. Hildebrand, V. Pebbles and D.A. Fraser, “Cooperative ecosystem management across the Canada-U.S. border: approaches and experiences of transboundary programs in the Gulf of Maine, Great Lakes and Georgia Basin/Puget Sound” *Ocean and Coastal Management* 45 (2002): 421-457.

³¹ Debora L. VanNijnatten, “The Constituent Regions of the Canada-United States Environmental Relationship,” in George A. MacLean, ed., “Canada and the U.S.: Relationship at a Crossroads?” Centre for Defence and Security Studies, Proceedings of the University of Manitoba Political Science Students Conference, Winnipeg, MB. Forthcoming 2006.

³² As a first step in building the database, we consulted existing studies, such as Swanson (1976), Stein and Grenville-Wood (1984), Canada School of Public Service (2004), as well as the CEC Transboundary Agreements Database. All linkages were documented; linkages for which no documentation could be found were not included. A number of linkages included in other studies are not included in our database, as back-checking revealed that the linkage was defunct or that provinces were listed as members but had not been active in the organization for some time. Further, linkages that were operational under the auspices of the federal governments were not included. 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 further deletions from the database, as additional linkages were declared inactive. A few additions also resulted from the verification process.

³³ Roger Frank Swanson, *The U.S.-Canada Relationship at the State/Provincial Level: A U.S. Perspective*. (Winnipeg, MN: The Natural Resource Institute, 1976), p.8.

were classified as pertaining to ‘environmental protection’ or ‘natural resources.’³⁴ Swanson included three types of interactions: (i) formal *agreements*, defined as jointly signed documents setting forth regularized interactive procedures; (ii) semi-formal *understandings*, defined as correspondence, resolutions, communiqués or memoranda, not jointly signed, setting forth regularized interactive procedures; and (iii) informal *arrangements*, where there are no jointly signed correspondence nor any non-jointly signed correspondence, resolutions, communiqués or memoranda, but regularized interaction takes place on the basis of other written or verbal articulations.³⁵ Informal arrangements constituted the majority – 71% – of interactions documented in Swanson’s study, while formal agreements constituted a mere 6% and understandings accounted for 24%. For the environmental-type interactions more specifically, 64 out of 65 environmental protection interactions and 125 out of 149 natural resource interactions were categorized as informal arrangements. Thus, fully 88% (189 of 214) of environmental interactions were considered informal. Only one environmental protection interaction was categorized as a formal agreement, none as understandings, while 24 natural resource interactions were identified as understandings, none as formal agreements.³⁶

This study adopts a ‘harder’ definition of state-province interaction which would exclude from consideration Swanson’s informal arrangements. We include in our database mechanisms setting forth procedures and conditions for regularized interactions in a formalized manner by means of – at least one of – jointly signed documentation, the incorporation of interactions into jurisdictional operating procedures and budget, or the establishment of identifiable institutions attached to resources and personnel. Consequently, we employ the term ‘linkage’ rather than the looser concept of ‘interaction.’ Given this more stringent approach, our database records a total of 74 state-province linkages which can be classified as ‘environmental,’ defined here as dealing with environmental protection and natural resource management, as well as energy and agriculture where these have environmental implications clearly expressed in their mandate or organizational focus.

State-Province Pairs

In the basic calculation here, the number of environmental linkages was totaled for each province paired with all border or border-region states.³⁷ Table 1 provides data for all state-province pairs that share at least ten environmental linkages, out of a total of 200 possible pairs. British Columbia-Washington is the pair with the greatest number of linkages (22), followed by Ontario-Michigan (17), Ontario-Minnesota (16) and Québec - New York (15). Ontario and British Columbia have the greatest number of environmental linkages with neighbouring states overall. Ontario has a high number of ties with *all* eight Great Lakes states, indicating a high level of clustering in this region. It is interesting to note that Québec shares a significant number of ties with its neighbour New York and has more ties with northeastern than with Great Lakes states. British Columbia shares many linkages with its contiguous neighbours but is also linked with California and Oregon, indicating another, west coast clustering. Indeed, the top ten state-province pairs in terms of the number of environmental linkages are almost exclusively Great Lakes and Pacific Northwest jurisdictions. Alberta makes an appearance in a ‘second tier’ of closely linked pairings, although these linkages are likely to be northwestern (and also not necessarily contiguous) rather than ‘plains’ or ‘prairie’ in orientation – Idaho, Washington and Oregon. The number of environmental linkages between New England jurisdictions and Atlantic provinces is

³⁴ Ibid., p.2.

³⁵ Ibid., p.12-13.

³⁶ Ibid., p.30.

³⁷ 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.

generally lower; the New Brunswick-Nova Scotia-Maine-New Hampshire-Massachusetts grouping suggests another regional cluster of pairings, however.

An important indicator of the nature of cross-border linkage, in addition to the raw number of linkages, is longevity. How long have particular pairs been interacting on environmental matters? Table 1 breaks out the data on the number of linkages for state-province pairs according to the date of establishment (pre-1980, 1981-85, 1986-90, 1991-95, 1996-2000 and 2000-05)³⁸ and provides the percentage growth in linkages for each time period as well as the growth overall. Here, the data shows that, for northeastern and Great Lakes pairs, a higher number of their total environmental linkages were established prior to 1980. This is particularly marked for pairings between Atlantic provinces and New England states, which had 50-60% of their total linkages in place by 1980. For pairings in the Northwest, a limited number of their linkages were in place by 1980. Indeed, the pair with the highest number of total environmental linkages – British Columbia-Washington – started with the lowest number of linkages established prior to 1980 (in the top pairs sample provided here). There were also different trajectories for linkage-building thereafter. For New England/Atlantic pairs, additional linkages were much more likely to be established in earlier periods, particularly during 1981-85 and 1986-90; in fact, the number of linkages between these state-province pairs tended to grow very little after 1990. Linkage-building between Ontario and its Great Lakes neighbours, and between Québec and its neighbours, continued to grow in all periods, although this was less the case during 1991-95. Pairings in the Northwest established more linkages in later periods. The 1991-95 period is illustrative of this trend, as growth in linkages occurred almost exclusively among northwestern pairs. The British Columbia-Washington pair stands out here; during 1991-95, 10 of a total 22 linkages between these neighbouring jurisdictions were established.

³⁸ In some cases, we used the date when a linkage became truly cross-border, i.e., a province joined an established inter-state organization.

**Table 1:
Top State-Province Pairs by Environmental Linkages and Time Period, 2005**

Pair	Total	pre 1980	1980 % of total	1981- 85	% Chg	1986- 1990	% chg	1991- 95	% Chg	1996- 2000	% chg	2001- 2005	% Chg	% growth overall	Growth # linkages
BC-WA	22	4	18	1	25	2	40	10	143	2	12	1	12	450	18
ON-MI	17	5	29	3	60	3	38	1	9	4	33	1	33	240	12
ON-MN	16	5	31	3	60	2	25	2	20	3	25	1	25	220	11
QC-NY	15	4	27	2	50	4	67	1	10	2	18	1	18	275	11
ON-NY	13	5	38	2	40	1	14	1	13	2	22	1	22	160	8
ON-WI	13	4	31	3	75	2	29	0	0	3	33	1	33	225	9
ON-OH	13	5	38	2	40	3	43	0	0	2	20	1	20	160	8
BC-ID	13	4	31	1	25	1	20	1	17	2	29	2	29	225	9
ON-PA	13	6	46	2	33	1	13	0	0	2	22	1	22	117	7
BC-OR	13	4	31	1	25	1	20	2	33	2	25	1	25	225	9
QC-VT	12	6	50	1	17	2	29	0	0	0	0	2	0	100	6
NB-ME	12	6	50	1	17	3	43	0	0	0	0	1	0	100	6
AB-MT	11	4	36	1	25	1	20	1	17	2	29	1	29	175	7
AB-ID	11	3	27	1	33	1	25	1	20	2	33	1	33	267	8
QC-PA	11	3	27	2	67	2	40	0	0	2	29	1	29	267	8
ON-IN	11	5	45	2	40	1	14	0	0	2	25	1	25	120	6
ON-IL	11	5	45	2	40	1	14	0	0	2	25	1	25	120	6
AB-WA	11	3	27	1	33	1	25	1	20	2	33	1	33	267	8
BC-MT	11	3	27	1	33	1	25	1	20	2	33	2	33	267	8
BC-CA	11	4	36	1	25	1	20	1	17	1	14	1	14	175	7
AB-OR	11	3	27	1	33	1	25	1	20	2	33	1	33	267	8
QC-ME	10	6	60	1	17	1	14	0	0	0	0	1	0	67	4
QC-NH	10	6	60	1	17	1	14	0	0	0	0	1	0	67	4
NS-ME	10	6	60	1	17	2	29	0	0	0	0	0	0	67	4
NB-NH	10	6	60	1	17	2	29	0	0	0	0	0	0	67	4
NB-MA	10	6	60	1	17	2	29	0	0	0	0	0	0	67	4
														Correl.*	-.48

NB: The numbers of agreements included under each of the 6 time periods may not add up to the total agreement number, as we could not find a date of establishment for a few linkages.

* Correlation between the growth of linkages (in raw numbers) over 1980-2005 and the number of linkages established before 1980.

Contrary to what one might expect, and as indicated in the British Columbia-Washington example, the pairs that had a higher number of linkages early on are not necessarily those for which linkages grew at a faster rate. In another example, the number of linkages between Alberta and Oregon, which shared only 3 linkages by 1980, grew more than twice as quickly as the number of linkages between Québec and Vermont, which already shared 6 linkages prior to 1980. In fact, there is a moderately strong, inverse relationship (-.48) between the absolute growth in linkages over the entire 1980-2005 period and the number of linkages established before 1980; the higher the number of linkages in 1980, the less likely a particular pair will have a high growth rate in linkages overall.

It is also important to examine the actual function of environmental linkages. A particular state-province pair (Pair A) might have eight agreements to share information and another pair (Pair B) might have only two agreements to harmonize their activities in the areas of, for example, environmental assessment and mercury pollution reduction. While the linkages between Pair A might be characterized as more *extensive* than

Pair B, the linkages between Pair B are more *intensive* in terms of the nature of their cross-border interaction.³⁹ The functional categorization will thus tell us considerably more about the intensity of relations among particular states and provinces, or groupings of states and provinces.

A spectrum of interactions ranging from less to more intense activities based on function is proposed, as noted in Figure 1, below:

**Figure 1:
Functional Spectrum**

Less Intense Linkages					More Intense Linkages			
information sharing	⇒	consultation	⇒	cooperation	⇒	harmonization	⇒	integration

Information sharing represents the least intensive form of cross-border interaction, based only on the exchange of verbal or written information on common issues. For example, as noted above, the Great Lakes states and provinces have established a joint database on water use. *Consultation* includes those activities which involve soliciting input or advice from a neighbouring jurisdiction on policy measures. We might use as an example the Legislators' Forum, in which legislators from Manitoba, Minnesota and the Dakotas meet annually to discuss policy issues of common interest. *Cooperation* can be regarded as actions leading to mutual benefits beyond information sharing or soliciting advice; here the focus is on actually working together. For example, New Brunswick and Maine have several agreements under which they jointly maintain international bridges. *Harmonization* is more ambitious, as it is based on action leading to a compatibility of actions based on a shared objective or set of objectives. One linkage which attempts to bring about harmonization is the NEG/ECP, which has released detailed recommendations for environmental objectives in areas such as mercury pollution reduction and acid rain that are to be incorporated into the environmental policies and laws of member jurisdictions. *Integration*, the most intensive form of cross-border interaction, involves the adoption of objectives and similar actions or policies to implement them under the auspices of the cross-border agreement or organization itself. One such interaction is the water-use annex to the Great Lakes Charter (still under development), which is to establish a body to approve withdrawals of water from the Great Lakes basin.

Table 2 breaks out the data for top pairs (again, those sharing a minimum of ten linkages) according to the number of linkages under each functional categorization and each as a percentage of the total. Across all pairs the most common functional orientation of environmental linkages is cooperation; almost half of all subnational cross-border linkages – 38 of 74 – are categorized as cooperative. This tendency is particularly marked in the Northwest pairings (British Columbia and Alberta with contiguous and western states), where linkages are more likely to be cooperative than linkages between pairs in other regions. Linkages focusing on information sharing and harmonization are also common. As one might expect given the limitations on subnational jurisdiction in international affairs, integrative mechanisms are rare and consist solely of joint water management linkages, including the Abbotsford-Sumas Aquifer International Task Force, the Great Lakes Basin Water Resources Compact, the Great Lakes Charter and the New Brunswick-Maine MOU regarding the St. Croix waterway. It should be noted that linkages among Great Lakes pairs are diverse and exhibit a balance among all functions except consultation. Indeed, the least common functional orientation across all pairs is consultation.

³⁹ A functional categorization rather than a schema based on the format of interaction (i.e. MOU, binational committee, agreement, etc.), as in Swanson's study, is employed because a particular format, such as an agreement or MOU, can be used at many points along the spectrum with very different implications for the actual depth of relations between the constituent units.

**Table 2:
Top State-Province Pairs by Functional Categorization, 2005**

Pair	Total	Information Sharing	% total	Consultation	% total	Cooperation	% total	Harmonization	% total	Integration	% Total	Longevity Index #
BC-WA	22	2	9	4	18	10	45	5	23	1	5	13.1
ON-MI	17	4	24	0	0	7	41	4	24	2	12	15.4
ON-MN	16	3	19	0	0	6	38	5	31	2	13	15.7
QC-NY	15	3	20	1	7	6	40	3	20	2	13	15.8
ON-NY	13	3	23	0	0	4	31	4	31	2	15	16.8
ON-WI	13	3	23	0	0	5	38	3	23	2	15	15.8
ON-OH	13	2	15	0	0	5	38	4	31	2	15	17.0
BC-ID	13	2	15	0	0	10	77	1	8	0	0	14.3
ON-PA	13	3	23	0	0	4	31	4	31	2	15	18.0
BC-OR	13	2	15	0	0	10	77	1	8	0	0	15.1
QC-VT	12	1	8	0	0	5	42	5	42	0	0	18.4
NB-ME	12	1	8	1	8	5	42	4	33	1	8	19.6
AB-MT	11	2	18	0	0	7	64	2	18	0	0	15.6
AB-ID	11	2	18	0	0	8	73	1	9	0	0	14.6
QC-PA	11	3	27	1	9	3	27	2	18	2	18	15.6
ON-IN	11	2	18	0	0	3	27	4	36	2	18	17.4
ON-IL	11	2	18	0	0	3	27	4	36	2	18	17.4
AB-WA	11	2	18	0	0	8	73	1	9	0	0	14.6
BC-MT	11	2	18	0	0	8	73	1	9	0	0	13.2
BC-CA	11	2	18	0	0	8	73	1	9	0	0	16.8
AB-OR	11	2	18	0	0	8	73	1	9	0	0	14.6
QC-ME	10	1	10	1	10	4	40	4	40	0	0	20.7
QC-NH	10	1	10	1	10	4	40	4	40	0	0	20.7
NS-ME	10	1	10	1	10	4	40	4	40	0	0	22.2
NB-NH	10	1	10	1	10	4	40	4	40	0	0	22.2
NB-MA	10	1	10	1	10	4	40	4	40	0	0	22.2
Totals		8	10	6	8	38	51	17	23	4	5	
Correl*			.11		.17		-.10		-.15		.28	
Correl**			.46		-.43		-.11		-.17		.47	

* Correlation between the percentage of total agreements by function and total number of agreements.

** The same correlation excluding the BC-WA pair

*** Correlation between longevity index and function.

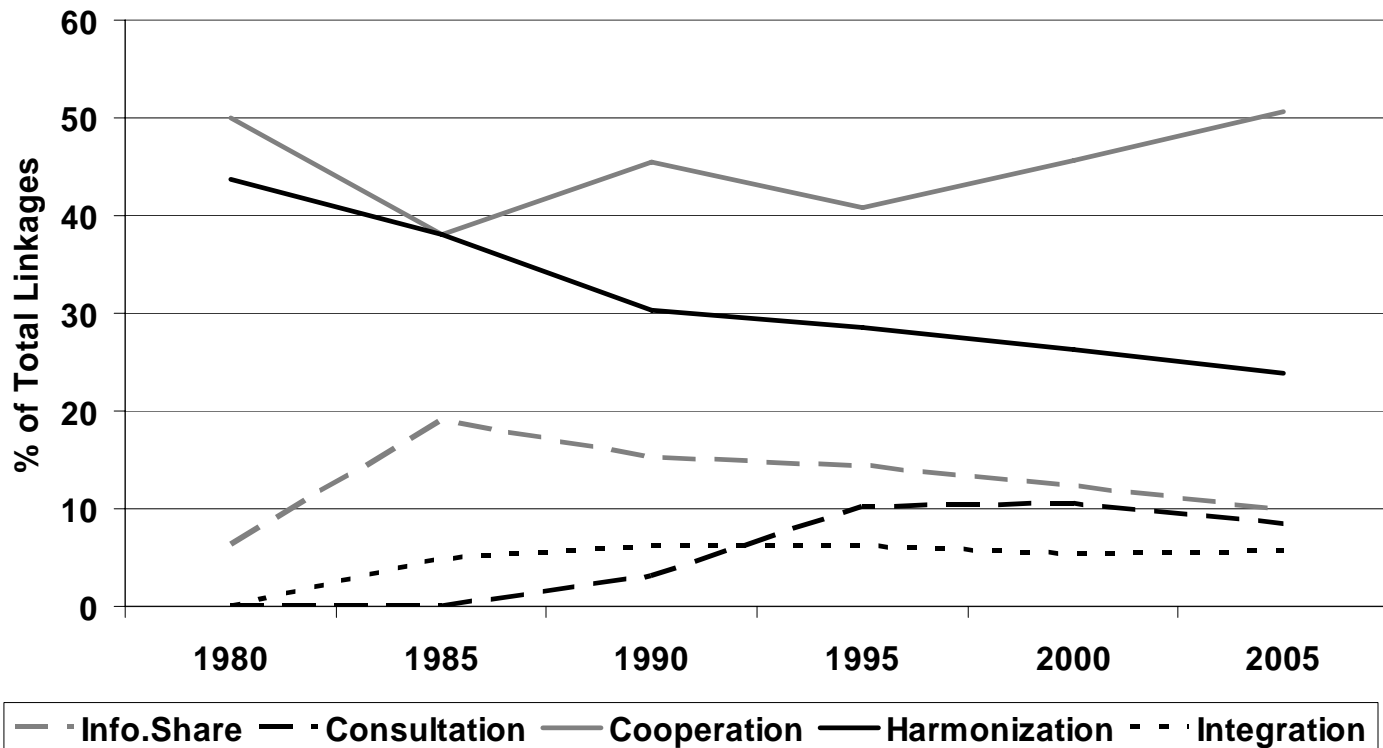
The Longevity Index is calculated as the average number of years that agreements have been in existence. NB: Agreements have been assigned an age corresponding to the date category to which they have been allocated, e.g., agreements from before 1980 are considered to be 25 years old, those implemented in the 1981-85 are considered to be 20 years old, etc.

One might hypothesize that those state-province pairs that share a higher number of linkages, i.e., where interaction is more extensive, might also exhibit more intensive interaction, i.e., with their linkages focusing on harmonization or integration as opposed to merely information sharing or consultation. If this were to be the case, one would expect negative relationships for the less intensive functions (information sharing, consultation) and positive relationships with the more intensive functions (harmonization, integration). However, when correlating the percentage of the total number of agreements by function with the total number of agreements, the relationships are not strong. Furthermore, with the exception of integration (which exhibits a weak positive relationship with total linkages), the signs for the remaining four functions are not in the expected direction. In

fact, to the degree there is a relationship, it is in the wrong direction. If we remove the British-Columbia-Washington pair from the calculation (because it is anomalous vis-à-vis other high-ranking pairs with regard to the information sharing, consultation and integration categories), a stronger relationship between integration and total number of linkages emerges although it is important to note that the correlations between the remaining functions and total linkages do not fit the expected pattern. Where state-province pairs share a higher number of linkages, these linkages are more likely to focus on information-sharing and integration. However, they are less likely to focus on consultation. Overall there is no strong pattern suggesting that a higher number of linkages clearly correspond with a tendency towards more intensive forms of interaction.

Similarly, one might also expect that linkages would become more functionally intense over time, moving from less ambitious activities such as information exchange and consultation to harmonization and integration. Yet, this, too, does not appear to be the case. Figure 1, which maps the changing proportion of environmental linkages by function over the six time periods, does not show a pattern consistent with increasing intensity of linkages over time. Integration did increase as a proportion of total linkages from 1980-85 but has since remained stagnant. Information sharing and consultation, by the end of the period, comprise a larger proportion of total linkages than they did at the outset. The proportion comprised by cooperation has varied over time but do not comprise a larger proportion of the total at the end of the period than they did in 1980. Conversely, the proportion of total linkages comprised by harmonization has declined steadily from 1980 to 2005.

Figure 2: Environmental Linkages by Function, 1980-2005



This broad aggregate pattern is also reflected in an examination of the relationship between longevity

and function (Table 3 below). If it were the case that longevity corresponds with intensity, one would expect to find negative correlations between longevity and functions on the less intense side of the continuum and positive correlations between longevity and functions on the more intense end of the continuum. Examining these correlations, they do tend to be relatively robust (with the exception of integration). However, the pattern in the direction of these relationships is highly mixed.

Table 3:
Function-Longevity Correlation

Function	Longevity Correlation
Information sharing	-0.5472
Consultation	0.434065
Cooperation	-0.48943
Harmonization	0.81183
Integration	-0.13253

State-Province Regions

As the discussion above indicates, environmental linkages are clearly regionally concentrated. Clusters of highly linked states and provinces can be found along the Canada-U.S. border, particularly in New England, the Great Lakes and the Pacific Northwest. In our discussion of state-province environmental regions, we employ some ‘variable geometry’ in order to test the boundaries of these cross-border regions: Pacific Northwest (BC, AB, WA, OR, ID, CA, AL), Great Lakes (ON, MN, IL, IN, MI, OH, WI, PA, NY),⁴⁰ Midwest (ON, MB, MN, IL, IN, MI, OH, WI), Northeast (QB, NB, NS, PEI, NL, NY, NJ, CT, VT, MA, NH, ME, RI) and New England (NB, NS, PEI, NL, CT, VT, MA, NH, ME, RI).

Table 4 provides data organized by region in two different ways. Assessing regional networks by totaling the number of linkages between state-province pairs within each region does not provide a good measure because of the unevenness of regional size and the fact that one linkage will be counted multiple times in order to take into account all pairs that are members. Instead, we provide an Index of Linkages, which is a measure of the average number of linkages per possible pair in each region, holding the total number of possible pairs (or the size of the region) constant. According to the Index of Linkages, the Great Lakes region exhibits the highest average number of linkages per possible pair, at 13.25, followed by the Midwest at 11.1. The region with the next highest number of linkages per pair, the Pacific Northwest, is some way back at 8.5. The New England/Northeast regions are very similar, at 7 and 7.1 respectively. And, the Plains/Central region has the lowest average number of linkages per possible pair, at 5.5.

Table 4 also provides an Index of Bilaterality, which is essentially the ratio of bilateral to multilateral agreements. 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. When viewing the two measures together, the New England region has a smaller number of agreements and institutions but these are largely multilateral, involving most or all members of the region. New England in fact scores lower than all other regions in terms of bilaterality (.49). The NEG/ECP, its Committee on the Environment and its International Committee on Energy, as well as the Gulf of Maine

⁴⁰ Québec was not included in the Great Lakes grouping as it does not participate in many Great Lakes activities, and instead participates in a great many bilateral activities with New York which are not in any way related to the Great Lakes basin and would skew the results. These Québec -New York activities are captured in the larger northeastern grouping.

Council on the Marine Environment and various northeastern forest and fire protection councils account for much of the cross-border activity in the region. The Northeastern bloc shows a higher tendency toward bilateralism, which can be seen in the many bilateral agreements for the joint management of waterbodies and waterways, such as Lake Champlain and the St. Croix river, for the exchange of environmental information and technology, and for energy-related interactions. While the Northeast region shares a host of multilateral agreements with the New England region, it also includes a number of agreements between Québec (not included in the New England grouping) and its neighbours.

Table 4:
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 <i>Provinces: NB, NS, PEI, NL</i> <i>States : NH, VT, ME, MA, CT, RI</i>	7.1	.49
Northeast <i>Provinces: QB, NB, NS, PEI, NL</i> <i>States : NH, VT, ME, MA, CT, RI, NY, PA</i>	7.0	.77
Great Lakes <i>Provinces: ON</i> <i>States : NY, PA, OH, MI, IN, IL, WI, MN</i>	13.25	1.05
Midwest <i>Provinces: ON, MB</i> <i>States : OH, MI, IN, IL, WI, MN</i>	11.1	1.5
Plains/Central <i>Provinces: MB, SK, AB</i> <i>States : WI, MN, ND, MT</i>	5.5	.54
Pacific Northwest <i>Provinces: BC, AB</i> <i>States : WA, OR, ID, CA, AL</i>	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.

In the Great Lakes, there is a combination of multilateral and bilateral activity; there are nine mechanisms incorporating all Great Lakes jurisdictions but also a host of bilateral agreements between Ontario and its neighbours. These latter agreements tip the balance of the region toward bilateralism; indeed, the Great Lakes region has a relatively high score on the index of bilaterality (1.05). The Midwest – the most bilaterally oriented region (1.5) – includes the multilateral Great Lakes activity, Ontario’s bilateral activity and also a significant number of bilateral agreements between Manitoba and its neighbours. The Plains/Central region scores relatively low in terms of both the number of environmental linkages focused on the region and on the

index of bilaterality. In examining the database, it would appear that pairs included in the Plains/Central region are often drawn into activities involving states in a ‘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) and the broader West (e.g. the Western Association of Fish and Wildlife Agencies).

In the Pacific Northwest, the picture is one of bilateralism, with the very close BC-Washington relationship at its core; the Northwest has the second highest score on the index of bilaterality (1.24) 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 those focusing on natural resource management at a broader regional level, such as the Western Association of Fish and Wildlife Agencies, the Western Legislative Forestry Task Force and the Western Wildlife Health Cooperative. However, British Columbia and Alberta are connected to their southern neighbours by a wide variety of bilateral agreements and institutions.

While the data in Table 4 provides us with some indication of the density of ties within the regions, it is also helpful to know whether some cross-border regions are ‘older’ than others, institutionally speaking. As in the discussion of pairs above, we have grouped the 74 linkages into 6 time periods according to the date of establishment but also by region. The findings in Table 5 show a picture very similar to that of Table 1; when looking along the entire border, the period during which the most linkages were established was prior to 1980. Almost all regions had a similar number of linkages established prior to 1980, although the Pacific Northwest had slightly fewer. This was followed by a period of relative inactivity across almost all regions in the early 1980s, with a few new linkages established in the Great Lakes, such as the Great Lakes Charter and the Great Lakes Water Use Database (both put in place towards the end of the period in 1985). Thereafter, activity in different regions takes varying paths.

Table 5:
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
Midwest	5	19%	3	4	4	5	5	25
Plains/Central	6	38%	2	1	1	3	3	16
Pacific Northwest	4	19%	1	2	10	2	2	23
Total	32	43%	11	20	20	15	18	74

* The number of linkages across all time periods may not add up to the total as a few linkages could not be properly classified – we are currently awaiting further information from linkage members.

The New England and Plains/Central regions were never as active in establishing linkages as prior to 1980, indicating early institutionalization. This is particularly marked in the case of New England, where almost half of all the region’s linkages – including the NEG/ECP as well as mechanisms focusing on resource management and energy issues – were in place prior to 1980. The broader Northeast region, however, experienced bursts of linkage-building in the late 1980s and more recently over the past few years. The increase in the late 1980s in the Northeast can be attributed to bilateral activity on the part of Québec, which signed a number of agreements with New York, Pennsylvania and Vermont, bilateral activity between Maine and its northern neighbours Nova Scotia and New Brunswick, and to the establishment of the multilateral Gulf of Maine Council. For the most recent 2000-2005 period, the increase in northeastern activity can be attributed

almost solely to new bilateral agreements signed between Québec and its New England neighbours – Vermont, New Hampshire and Maine.

Linkage building in the Great Lakes has been relatively stable, with consistent activity to put in place additional water quality and resource management mechanisms through all time periods, until the most recent period 2000-2005, during which cross-border linkage-building appears to have stalled. The Plains/Central region has seen some new linkages during the two most recent periods; Manitoba and its neighbours Minnesota and North Dakota put in place a number of new bilateral agreements, particularly during the 2000-2005 period, some of which deal with water resource management issues arising out of the continuing Devil’s Lake dispute. On the other side of the continent, the Pacific Northwest region experienced a burst of new linkages – ten – during the 1991-95 period, that was not matched previously or has not been matched since. British Columbia and Washington state signed an Environmental Cooperation Agreement, established an Environmental Cooperation Council along with a number of independently focused task forces, and put in place mechanisms for interagency coordination in the early 1990s. In more recent time periods, activity in the region has been fueled by additional bilateral activity, as BC and AB establish additional linkages with their contiguous state partners.

Neither are there marked differences across regions in terms of the functional orientation of linkages. As shown in Table 6, in all regions, cooperation and harmonization linkages are most common. The Pacific Northwest region has more consultative linkages, while the Great Lakes/Midwest and Plains/Central regions employ information sharing mechanisms to a greater extent. There does not appear to be a strong relationship between total number of linkages and the intensity of linkages. For the most part, correlations between the proportion of linkages comprised by a particular function and total linkages are weak. The one notable exception (harmonization) is not in the expected direction.

Table 6: Linkages by Region and Function

Region	Total Linkages	Information Sharing	% total	Consultation	% total	Cooperation	% total	Harmonization	% total	Integration	% total
New England	12	1	8	1	8	5	42	4	33	1	8
Northeast	20	1	5	1	5	12	60	5	25	1	5
Great Lakes	21	4	19	0	0	10	48	5	24	2	10
Midwest	25	4	16	1	4	12	48	6	24	2	8
Plains/Central	18	4	22	1	6	9	50	4	22	0	0
Pacific Northwest	23	2	9	4	17	11	48	5	22	1	4
Correl*			.18		.01		.35		-.80		.02

* Correlation between the percentage of total agreements that focus on function specified in column and total number of agreements.

Discussion

On the basis of the data presented above, one can make some tentative observations about subnational environmental linkages along the Canada-U.S. border more generally. Three decades after Swanson's work, it is clear that state-province environmental linkages have indeed become more formal.⁴¹ While Swanson found only a handful of formal agreements on natural resource and environmental protection matters, this study has verified the existence of 74 formal state-province linkages. This study also indicates that subnational and regional interactions have been institutionally and functionally 'intact' for longer than most observers of Canada-U.S. environmental relations might expect, certainly longer than they have been the subject of intensive study. The number and functional variety of environmental linkages already in place by 1980 attests to this fact. It would also appear to be the case that state-province linkages focusing on natural resource matters – forests, fish, energy – were the first to be put in place; linkages focused on pollution and environmental protection are more recent phenomena. This is not surprising in light of the later appearance on political agendas of environmental-sustainability concerns.

One of the most interesting findings of this study is that subnational and regional cross-border environmental linkages, contrary to what one might expect, particularly from the case study literature, have become more numerous over time but not necessarily more intense in functional terms. Linkages focused on cooperation have been a popular choice across all time periods. More ambitious harmonization activities are on the decline, while integration linkages certainly do not show any increase. Instead, the relationship between the number of linkages and functional orientation – or linkage extensiveness and intensiveness – appears to be more complex. The data provided in this study indicate that where state-province pairs share a higher number of linkages, these linkages are more likely to be oriented toward both ends of the functional spectrum: information sharing and integration. This may suggest that the two functions are necessary partners in the development of more intensive cross-border relations. It might also be that functional intensity is better measured by analyzing the actual projects undertaken by established cross-border regions. Certainly, the latter proposition squares with the case study and anecdotal literature indicating an escalation of ever more ambitious projects by well established cross-border institutions such as the NEG/ECP and the British Columbia-Washington state Environmental Cooperation Council. Future analysis of subnational cross-border activity needs, then, to find some way to account for 'project intensity' comparatively, across cross-border institutions in different regions.

Given the inductive approach of the study, we can also make some observations about *environmental regions* along the Canada-U.S. border. Subnational cross-border environmental interactions are characterized by complex networks of overlapping relationships which themselves vary in their extent and intensity. Certainly, as indicated in Tables 1 and 2, there are close and important bilateral relationships between states and provinces all along the Canada-U.S. border. However, particular pairs such as British Columbia-Washington and New Brunswick-Maine, or sets of pairs such as Ontario with its Great Lakes neighbours, seem to have both extensive and intensive relations and may act as a key component – or, in the case of the Pacific Northwest, the anchor – for regional clusters of subnational cooperation in the Pacific Northwest, the Great Lakes and New England. The Great Lakes states and Ontario comprise the most cohesive environmental region, given the network of both bilateral and multilateral linkages that connect jurisdictions bordering the basin. Québec, though it lies at the 'tail end' of the basin on the St. Lawrence, seems much more oriented toward the Northeast rather than the Great Lakes region, institutionally speaking. The New England region appears to focus most immediately around New Brunswick, Nova Scotia, Maine, New Hampshire and Massachusetts. The Northwest region includes BC and Washington but also Oregon, Idaho, Montana and Alberta. The inclusion of these latter two jurisdictions may seem surprising to observers who consider them to be Plains or Prairie jurisdictions; in fact, Alberta is much more closely tied to the Northwest in environmental-linkage terms than it is to the

⁴¹ Certainly, the data presented here is not directly comparable with Swanson's 1976 data; Swanson focused on a range of 'interactions,' informal as well as formal, while this study focuses only on formal linkages.

Plains/Central region.

These main clusters can also radiate influence outward to draw in other states and provinces for particular purposes. For example, there are active bilateral relationships in the northeast between Québec, New York and Vermont and these are often incorporated in broader northeastern environmental efforts. In addition, the tentacles of the Northwest region reach out to Alaska and California on selected issues such as coastal management and energy. The Plains/Central and Midwest regions are not nearly as cohesive as the other environmental regions; indeed, one might argue that these do not constitute environmental regions at all, but rather a set of bilateral relationships that exist independently or get drawn into other regional linkages depending on the issue. Thus, we might consider environmental regions to have boundaries that are firm enough that we can identify membership in a region for most purposes, i.e., Québec does not belong in the Great Lakes cluster and Alberta does not belong in the Plains cluster, but flexible enough so as to incorporate other relationships.

Certainly, while the boundaries of environmental regions are defined in large part by shared watersheds and other environmental spillovers in places such as the Great Lakes basin, the Gulf of Maine ecosystem and Georgia Basin-Puget Sound ecosystem. However, more careful study of other causal factors, e.g., economic relationships and cultural similarity, is necessary before the logic of boundary drawing is declared to be entirely ecologically determined.

This study also shed some light on the nature of particular regions. It would appear that New England tends to be multilateral in orientation, with linkages well established (half by the 1980s) and focused primarily on cooperation and harmonization. The New England region, which in the case study literature seems to be most ambitious in its cross-border endeavours, e.g., NEG/ECP Climate Action Plan, now appears to be reaping the benefits of the early institutionalization of linkages encouraging cooperation and even a harmonization of environmental efforts. A good example here is the NEG/ECP Climate Action Plan. On the edges of this core New England region with its well established, multilateral picture, more recent bilateral agreements have been put in place, as seen in the numerous Québec-initiated linkages. Similar observations can be made about the Great Lakes region. The Great Lakes region is well established, exhibits a balance between bilateral and multilateral interaction, and has shown more consistent activity over the time period under study. Just outside its boundaries exist a series of bilateral relationships that reach into the core region on specific issues. The Plains/Central region is least cohesive of all regions. Although this region started with as many linkages as other regions, there has been relatively little activity since, and there is more reliance on information sharing, less on harmonization of activities. In addition, while it is apparently multilateral in orientation, this does not imply collective activity within the Plains/Central region itself, but incorporation into other larger and more active regions. The Pacific Northwest, as noted above, is more recently institutionalized and largely cooperative; a strong British Columbia-Washington state bilateral relationship anchors a broader region that also exhibits some multilateral activity.