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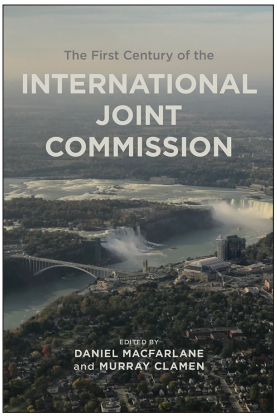

THE FIRST CENTURY OF THE INTERNATIONAL JOINT COMMISSION

Edited by Daniel Macfarlane and Murray Clemen

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Origin of the Great Lakes Water Quality Agreement: Concepts and Structures

Jennifer Read

For those whose work focuses on the Great Lakes and their ecological integrity, the image of Pierre Elliot Trudeau and Richard Millhouse Nixon smiling—or wryly grimacing?—at each other as they clasp hands over the newly signed Great Lakes Water Quality Agreement on 15 April 1972 is iconic. In the nearly fifty years since that time, water quality activities in the Great Lakes basin, whether occurring at the national, state, provincial, or even local levels, have been driven by the contents of the original agreement and its subsequent iterations.

The Great Lakes Water Quality Agreement is an executive agreement between Canada and the United State for the express purpose of improving Great Lakes water quality. As an executive agreement, it does not have treaty status and is amended by an exchange of letters; its contents are *not* ratified by the US Senate. The agreement is also a standing reference to the International Joint Commission (IJC) under the Boundary Waters Treaty of 1909.

The two countries signed the 1972 agreement in the shadow of the first Earth Day, with the purpose of reducing eutrophication-causing phosphorus inputs to the lower Great Lakes. Six years later, they broadened the scope of the agreement to reduce inputs of toxic substances and initiate an

Figure 11.1. Trudeau and Nixon signing the GLWQA.

ecosystem approach to managing human interaction with the lakes, expanding the agreement to all the Great Lakes. In 1987, the agreement was further revised by protocol that expanded the scope of the ecosystem approach, although it retained its specific focus on water quality, and introduced programmatic opportunities to restore water quality in identified toxic "hot spots" as well as in the open lakes.

Just as the agreement has evolved since it was signed, the 1972 document represents a single point—albeit a high point—along the trajectory of evolving scientific understanding and societal appreciation that have influenced governance arrangements and management actions related to water quality of this great binational resource since the early twentieth century. Three times between 1912 and 1972 the governments of the United States and Canada asked the IJC to determine if boundary waters were being polluted on one side of the international border to the detriment of health and property on the other, and to suggest remedial

measures to address the situation. This chapter investigates the evolution of thinking about managing binational water quality as expressed in the reports or follow-up of each of these investigations, and it will demonstrate that much of what was eventually included in the agreement was developed during that 1912–72 period through the binational discussion and exchange facilitated by boundary water pollution references.[1] It also considers the question posed by the editors of this volume—Is the Boundary Waters Treaty and the IJC "a pioneering model of bilateral environmental co-operation?"—by asserting in the affirmative, that, in the balance the treaty, the processes it engendered, and its institutions, including the Great Lakes Water Quality Agreement, have enabled better bilateral relations at the operational level for water resource managers in the United States and Canada, especially in the water quality realm.

The chapter begins with a discussion of a draft binational convention, developed in the 1920s after the IJC reported on its first reference, a 1912 assignment to investigate the state of boundary waters pollution. Jamie Benidickson's chapter in this volume, "The IJC and Water Quality in the Bacterial Age," provides detail on that first reference, in the context of the contemporary public health–sanitary engineering debate—whether to treat the municipal water supply at the point of distribution or to neutralize the effluent released from a community. The convention drafted as a result of the IJC's *Pollution of Boundary Waters Report* in 1918 included several elements that were later incorporated into the 1972 agreement. Two of these will be discussed here—the inclusion of a "standing reference," and a section that set out an approach to establishing pollution control measures for commercial vessels. The chapter will then trace the evolution of binational pollution engagement in the years after the Second World War, when the Connecting Channels Reference (1946–9) and its aftermath, and the Lower Lakes Reference (1964–9), provided many familiar elements later incorporated into the agreement, including General and Specific Water Quality Objectives, an acknowledgement that priority uses for boundary waters had expanded with societal changes in the postwar era, and the development of a binational governance structure that featured equal representation from US and Canadian governments and which benefited from and fostered a larger "Great Lakes" identity among board appointees. The chapter concludes by connecting these elements,

extensions of the institutions developed under the Boundary Waters Treaty and auspices of the IJC, to the comparatively successful bilateral environmental relationships we in the Great Lakes enjoy.

The Convention Manqué: Prototype

In 1912, the governments of the United States and Canada asked the IJC to undertake its first investigation along the common border—to investigate the extent, causes, and location of boundary waters pollution and to provide advice on remedial measures addressing it. Reporting in 1918, after the largest bacteriological investigation in the world to that time,[2] the IJC recommended strengthening US and Canadian efforts to address Great Lakes pollution, including expanding the commission's role and recognizing that expanded role in a further bilateral agreement between the two countries. In response, the governments asked the IJC to draft a convention that incorporated its recommendations.[3]

On the surface it appeared as if this convention would fit into a number of initiatives between the two countries that had begun with the Boundary Waters Treaty of 1909. The gradual withdrawal of the British Foreign and Colonial Offices from Canadian-American relations had helped to improve relations significantly between the two countries. The successful operation of the IJC under the Boundary Waters Treaty is just one example of growing amity. The Migratory Bird Convention in 1916 provided further impetus for co-operation over natural resource management. The success prompted the Canadian Commission of Conservation to praise the emerging "system of practical co-operation in the protection of mutual [North American] interests," and to predict that as "new occasions for parallel action arise, the difficulties should prove easier of solution in light of the successes already attained."[4]

However, managing pollution in the Great Lakes, it turned out, would not to be one of those "new occasions for parallel action"—not yet, at least. The US government was not satisfied with the initial draft convention provided by the IJC, which was linked closely to the Boundary Waters Treaty. In 1926, therefore, the United States sent a new draft, written to be independent of the treaty, to the Canadian government with the intention that, should either document require future revision, it would not also

require revision of the other document.[5] Although internal Canadian review by the affected federal departments was positive, it did not progress speedily. IJC had to remind the agencies to provide their feedback, which was completed—and all positive—by May 1928; however, communication between the two countries related to the convention lapsed until it was revived by a State Department memo to the Canadian ambassador to the United States, Vincent Massey, on 25 October 1929.[6] Four days later, the New York Stock Exchange crashed, and soon attention shifted to fighting the Great Depression. For the time being, neither government had the energy or impetus to consider boundary waters pollution.

A quick examination of the revised draft convention, however, will demonstrate that concepts later included in the Great Lakes Water Quality Agreement were already under consideration in the binational Great Lakes well before 1972. The revised draft consisted of seven articles, intended to enforce the pollution clause in article iv of the Boundary Waters Treaty and reflecting findings and recommendations from the 1918 report.[7] One key concept in the draft document was the idea of a "standing reference." In addition to responding to requests from either or both the US or Canadian federal governments, the draft convention provided the IJC itself with authority to "enquire and determine whether any person by act or omission is polluting or contributing to the pollution of any waters on either side of the boundary between the United States and Canada to the injury of health or property on the other side."[8] The convention went on to lay out the processes and procedures for conducting such investigations, including authority to compel witnesses and the obligation to give anyone a hearing whose acts or omissions were under investigation. It provided details on how the IJC could access relevant technical expertise and a process for funding such investigations. It outlined the content of resulting reports, in addition to when, how, and to whom they should be made.[9] These latter details were already established as the process by which IJC references were conducted; however, the idea that the IJC could initiate such an investigation on its own was new. It offered the IJC an additional degree of autonomy that, as noted in the introduction to this collection, had not been considered achievable when the treaty was negotiated barely twenty years prior.

The 1972 Great Lakes Water Quality Agreement granted a similar level of autonomy to the IJC. The agreement laid out very specific responsibilities for the commission, including collating, analyzing, and disseminating data and information on Great Lakes water quality, assessing the effectiveness of programs designed to improve water quality, and providing advice on how to improve programs when they fell short.[10] In addition to this ongoing role to assess agreement-implementation progress and provide program advice, the agreement also empowered the IJC to "at any time make special reports to the Parties, to the State and Provincial Governments and to the public concerning any problem of water quality in the Great Lakes System."[11] These elements together have been interpreted as a "standing reference" because they empower the commission to undertake water-quality-related investigations without requiring them to be initiated by either federal government.[12]

Another idea incorporated into the 1972 agreement was initially introduced as a result of the first pollution reference—the idea that commercial vessels should be regulated in order to manage the pollution they discharged into the system. As directed under the first pollution reference from the two governments in 1912, the IJC's 1918 report outlined the sources and extent of existing pollution between Rainy River in the west and the St. Lawrence River in the east, and offered the commission's carefully considered recommendations for remedial measures. Unsurprisingly, the investigation found that the connecting channels, mouths of rivers, and other near-shore areas close to municipalities were heavily polluted by raw sewage. Surprisingly, however, they also found that commercial vessels discharging sewage and foul ballast water were a serious cause of pollution in the middle of otherwise pristine lakes. The navigation channels, for example, could be traced right down the middle of a lake by following the trail of polluted water.[13] As a result, pollution from commercial vessels easily crossed the international border from one side to the potential injury of health and property on the other because shipping channels typically trace the international border or are located in close proximity. This situation clearly violated the Boundary Waters Treaty and yet had not even been considered an issue when the treaty was negotiated.

As a result of the 1912 pollution investigation, the IJC recommended the US and Canadian governments develop common approaches to address

vessel pollution.[14] When given the opportunity to incorporate this recommendation into the draft convention, the IJC proposed that it be given a significant role related to managing commercial vessels. This included the responsibility to define the size and type of vessels requiring sewage, bilge, and ballast water treatment, and equipment to prevent oil discharge. While the IJC would not have direct regulatory authority over commercial vessels, the convention proposed that compliance with IJC guidelines be required in order to acquire a commercial operating licence.[15]

The 1972 agreement did not give the IJC responsibility for developing measures to reduce or control vessel pollution. However, it did commit the parties to the agreement to doing this together in a way that produced "compatible regulations" that would govern design, construction, and operations of commercial vessels, and ensure that garbage, sewage, waste water, oil, and other "hazardous polluting substances" were not discharged from them into the Great Lakes.[16] The international "water highway" of the Great Lakes was being polluted by one of the key sectors for which the Boundary Waters Treaty had been negotiated—commercial navigation—and that clearly needed to end.

Although initially inviting the IJC to draft the convention in order to implement its 1918 recommendations, the US and Canadian governments seemed to lose interest in the document by the end of the 1920s. That can be attributed, in part, to the widespread adoption of chlorine in municipal water systems, which led to a precipitous decline in water-borne illnesses from drinking water, and an accompanying reduction in political pressure to do something about pollution in the Great Lakes and inland waters. The province of Ontario, for example, experienced a 20 per cent reduction in cases of water-borne typhoid fever during the middle years of the 1920s, when most municipalities with surface source water implemented chlorination.[17] The Great Depression and Second World War served to further divert interest from Great Lakes water quality, and it was only after the war that thoughts returned to the convention.

The 1930s and '40s, in the meantime, witnessed a continuing decline in water quality throughout the Great Lakes basin. During the Depression, building sewerage systems was well beyond the means of most communities in the region.[18] The onset of the Second World War diverted resources, which might have otherwise been allocated to pollution control

infrastructure, into the massive industrial expansion of the war effort. By the end of the war, the region was home to rapidly growing industrial communities that, in many cases, lacked even the basic infrastructure to control municipal and industrial pollution. This was especially true for the St. Clair–Detroit River system, the southern Lake Erie shoreline between Toledo and Cleveland, the Niagara River, and the north shore of Lake Ontario between Hamilton and Oshawa. The connecting channels and lower lakes—Erie and Ontario—bore the brunt of the wartime and postwar expansion.

The Connecting Channels Reference: Familiar Concepts and Structures Emerge

In 1946 the United States and Canada again sent the IJC a reference to investigate boundary waters pollution, asking the commission to investigate the state of the connecting channels—the St. Clair River, Lake St. Clair, and the Detroit River. Later that year the two governments added the St. Marys River, from Lake Superior to Lake Huron. And in 1948 they added the Niagara River to the connecting channels pollution reference. Between 1946 and 1949, then, the IJC undertook a second comprehensive water quality survey of these waters, closely following the methods it had developed in the initial pollution reference in 1912. This enabled the commission to provide a close comparison of the state of the waters between the early and mid-twentieth century.

A short overview of the study and its findings will provide important context for the remaining discussion of the emergent concepts and governance structures finally incorporated into the Great Lakes Water Quality Agreement. The sixty-one communities under investigation along the connecting channels had a combined population of just over 3.5 million. Of those, 96 per cent had sewerage service and 86 per cent of that sewage had primary treatment. In the 1940s, primary treatment consisted of settling out the solids and then disinfecting the effluent before releasing it. Despite this relatively large extent of sewage treatment, the investigation found that bacteria levels were three to four times higher in 1946 than when they had last been tested in 1913. Clearly, primary treatment was not sufficient to safeguard raw water quality.[19]

While the IJC's 1918 pollution report had made only passing reference to industrial pollution, focused as it was on municipal waste (i.e., raw sewage), by 1946 the volume of pollution in the St. Clair–Detroit River system from industrial sources surpassed the amount of human waste entering the waters. After the Second World War, the average daily discharge of effluent from industries was more than 2 billion gallons, while municipalities released the comparatively smaller amount of 750 million gallons each day. However, the effect of the combined effluent on the biological functioning of the rivers amounted to that of a population twice the size of the number of people then living along the rivers.[20] In addition to the large amounts of suspended solids and oils, 13,000 pounds of phenols, 8,000 pounds of cyanides, and 25,000 pounds of ammonium compounds also entered the two rivers. Taking cyanide as an example: 8,000 pounds a day would result in a concentration of a little more than 8 micrograms per litre (µg/l).[21] A recent (2007) analysis by the World Health Organization noted that the US Environmental Protection Agency (EPA) reported that the "mean cyanide concentration in most surface waters in the USA is less than 3.5 µg/l," and that "levels are higher only in limited areas."[22] The influx of industrial wastes to the St. Clair and Detroit Rivers in the postwar era was approximately twice that routinely found in surface waters today.

General and Specific Water Quality Objectives

Given the preliminary results of the connecting channels survey, the IJC asked the technical experts conducting it to develop a list of Water Quality Objectives. These were intended to establish benchmarks against which the nature and extent of pollution could be assessed over time, and toward which municipalities, industries, and the states and province could work in reducing pollution. In April 1948, therefore, the IJC adopted Objectives for Boundary Waters Control. The objectives were divided into two categories. The first category, General Objectives, related to overall water quality and was intended to ensure that all effluent released into boundary waters, whether from municipal sewerage systems, industrial processes, or stormwater, was of high enough quality that it not interfere with established or desired uses of boundary waters.[23] The second category, Specific Objectives, identified very explicit maximum loads for specific pollutants.

For example: domestic sewage and ship effluent should have a concentration of no more than 2,400 *B. coli* per 100 ml of water prior to dilution in the open waters; the class of industrial chemicals called phenols should be at no higher concentration than 5 parts per billion after dilution.[24]

The idea of setting General and Specific Water Quality Objectives, first adopted in the late 1940s as a result of the Connecting Channels Reference, proved to be an important concept that was later incorporated into the Great Lakes Water Quality Agreement in 1972. Similar to the 1940s, the General Objectives laid out in the agreement were high-level, aspirational statements for the quality of boundary waters, and included the idea that they should not be polluted with human-introduced materials that were harmful to human, animal, or aquatic life, that might form "putrescent or otherwise objectionable sludge deposits." Likewise, human activities should not introduce debris such as oils, scums, and "other floating materials" in quantities sufficient to reduce aesthetic values, or introduce a nuisance taste, odour, or colour. Finally, human-introduced nutrients should not be in such concentrations that they encourage aquatic weeds or algae to grow.[25]

Specific Objectives in the 1972 agreement identified levels of individual substances, or physical effects, that both sides agreed were either a minimum or maximum desired limit for a given portion of the boundary waters "taking into account the beneficial uses of the water that the Parties desire to secure and protect."[26] With foresight, the negotiators of the agreement recognized that Specific Objectives were likely to change over time as new substances were identified, as new evidence suggested that earlier maximum or minimum levels were no longer sufficient, or as unanticipated issues arose. As a result, the Specific Objectives were placed in an annex to the agreement. This was meant to provide greater flexibility, with the parties agreeing to revisit the Specific Objectives periodically per the consultation and review provisions laid out in the agreement.[27]

Conflicting Uses: Updated and Revised Order of Precedence

The IJC presented its initial findings about the state of the connecting channels during public hearings held in communities on both sides of the St. Clair, Detroit, and Niagara Rivers in the summer and fall of 1948 and again in 1949. These meetings were attended by industrial and municipal officials, representatives of interested non-governmental organizations, and citizens from the communities in which the hearings were held. The hearings confirmed that the public was quite aware of the deplorable state of the connecting channels. They also highlighted a growing conflict between long-accepted uses of the water, such as for disposal of sewage and industrial waste, and emerging uses requiring much better ambient water quality. One of the more sensitive of these uses was for tourism. The immediate postwar period saw an explosion in the use of beaches and riverside parks along the connecting channels. This was the beginning of a huge outdoor recreation boom fueled by unprecedented postwar economic growth, which spread across almost every income level and social group in the Great Lakes basin. This general prosperity, combined with the greater mobility provided by private cars and the growth of highways, allowed more people to get away from their urban and suburban homes for vacations and weekend car trips.

The understanding of potentially conflicting uses of boundary waters and how they might be affected by both reduced water quality and quantity, had evolved in complexity through the century. The Boundary Waters Treaty gave the IJC authority to approve the "use, diversion or obstruction" (i.e., the available amount) of boundary waters only if the proposed activity did not materially interfere with any use above it in the established order of precedence of uses. The order of precedence, laid out in article viii of the treaty, was as follows: first, domestic and sanitary uses; second, navigation, including diverting water into canals to go around waterfalls and rapids; and third, power and irrigation. Article viii dealt strictly with water quantity and was intended to ensure that enough water was available for the established uses, not that it be of an appropriate quality. When the IJC reported on its first pollution report in 1918, the idea that one use of the Great Lakes—navigation—was in conflict with another

use—municipal water supply—due to the impact on water *quality* represented the first evolution in thinking. Thus it was an important transition when the IJC reported on its initial pollution reference indicating that water quality was also an important consideration.

By the Connecting Channels Reference in the late 1940s, the conflict between these competing uses was even more heightened. Tourism was second only to the auto industry in Michigan and the third-most important economic activity in Ontario. The commissioners learned during public hearings that polluted boundary waters would have significant economic repercussions if it meant tourists went elsewhere as a result.[28] The commission therefore asserted in its 1951 report that, in general, all effluent released into boundary waters, whether from municipal sewerage systems, industrial processes, or stormwater, needed to be of sufficient quality that it not interfere with established or desired uses of boundary waters.

In its 1951 *Report of the International Joint Commission United States and Canada on the Pollution of Boundary Waters*, the commission proposed an expanded and updated list of priority, or desired, uses. In addition to municipal and sanitary uses, the IJC added industrial applications to the most important uses, or most sensitive in terms of water quality. This was because many industrial processes, such as food processing and chemical production, required very high raw water quality. Navigation remained the second-most important use; the commission then named fish and wildlife, swimming, recreation, and "other riparian activities" to the final group, which had previously included only irrigation and power. This expanded list was the IJC's acknowledgement of the growing importance of outdoor recreation and a societal appreciation for aesthetic concerns. These more sensitive uses of boundary waters were given weight against the health and economic uses originally identified in the treaty.[29]

While not directly enumerating a new order-of-precedence list, the 1972 agreement clearly prioritized more-sensitive uses of water over less-sensitive needs, based on water quality. For example, the definition of Specific Water Quality Objectives stated that allowed levels of substances or physical effects would take "into account the beneficial uses of the water that the Parties desire to secure and protect." Further, the General Objectives identified aesthetic and ecological benefits such as aquatic life and waterfowl. Aesthetics were also called out when the Parties committed

to avoid "putrescent or otherwise objectionable sludge deposits," "unsightly or deleterious" floating materials, or anything causing nuisance colour, odour, or taste, and excessive nutrients causing algal blooms or aquatic weed growth. Health and well-being rounded out the priority list. The General Objectives aspired to avoid substances at concentrations harmful to humans, animals, or aquatic life.[30] It is difficult to draw a more direct comparison between the uses implied in the agreement and those stated outright in the treaty, given the former's focus on water quality alone. However, it is clear that by 1972 there were many more broadly recognized competing uses for the Great Lakes than there had been in 1909.

New Structures Emerge: Binational Pollution Boards

The IJC's 1951 connecting channels report concluded that those responsible for generating pollution should be required to meet the cost of cleaning it up and that the United States and Canada had adequate legislative authorities to accomplish this. In order to achieve the necessary focus on water quality that would ensure the application of these authorities, the IJC also asked that it be authorized to establish and supervise "boards of control" for boundary water quality. The boards would ensure that the Water Quality Objectives were met through the adoption and implementation of the 1951 report's recommended remedial measures. These boards were likely envisaged to operate similar to the water quantity boards of control for several of the Great Lakes, as described in Clamen and Macfarlane's chapter in this volume. The boards of control were responsible for maintaining water at IJC-designated levels by regulating and coordinating the operation of hydroelectric power canals, compensating works, and navigation locks at these locations. Similarly, the IJC anticipated that the proposed water quality boards would identify municipalities, businesses, and individuals whose actions contravened the Water Quality Objectives, allowing the IJC to inform those in violation about expected remedial measures. If actions to improve water quality were not taken promptly after the offender was informed, the commission would notify the responsible government authority with recommended corrective action(s).[31]

In November 1951, the US and Canadian governments authorized the IJC to establish and maintain supervision of boundary water pollution and the remedial measures necessary to control it. The commission promptly appointed permanent, binational Technical Advisory Boards on Pollution Control for the connecting channels, comprised primarily of the state, provincial, and federal agency personnel who had conducted the connecting channels pollution reference. While oversight of these boards represented an expansion of the IJC's current duties, it did not approach the level of authority the IJC had requested in the 1918 pollution report and incorporated into the draft convention. Nor, in the end, were the bodies called "boards of control." This decision appears to have been an acknowledgement of potential political barriers to the IJC attaining additional authorities.[32]

The idea of technical advisory boards, consisting of representatives of the pollution management agencies from the affected jurisdictions, was a natural outgrowth of the way the IJC conducted investigations sent to it by the two governments. Lacking large technical staffs with which to conduct involved, binational investigations, the IJC had determined very early in its existence that the best way to carry out a reference was to second the necessary expertise from the state, provincial, and federal agencies whose jurisdictions were touched by the study. The commission strove for jurisdictional parity in numbers from the beginning as well. This configuration was IJC standard operating procedure, so much so that many state and provincial agency personnel found themselves almost continuously on IJC study boards or appointed to the technical advisory boards in the post–Second World War era. For example, A. E. Berry from Ontario served on the connecting channels study board, was appointed Ontario's representative to the Technical Advisory Boards on Pollution Control, and later provided advice to the IJC from retirement as it set up the lower lakes pollution study in the 1960s.[33] The configuration of the technical advisory boards was therefore determined from IJC practices established at the outset of its binational work.

This board structure, balanced according to national and jurisdictional representation, was subsequently incorporated into the 1972 agreement. The negotiators identified two key functions for which the IJC required additional support, and they developed separate advisory boards to

provide it. The first group, designed to "assist in the exercise of the powers and responsibilities assigned" to the IJC under the agreement, was named the Great Lakes Water Quality Board. This board's membership consisted of equal numbers of representatives of the US and Canadian governments representing the signatory parties to the agreement—the US EPA and Environment Canada—as well as from each of the states, and the province of Ontario. The second group, a Research Advisory Board, was also appointed to provide advice to the commission on important gaps in knowledge on which the IJC, in turn, could advise the parties. It, too, was comprised of equal numbers of US and Canadian appointees.[34] These groups provided opportunities to build regular, binational working relationships as the agreement was implemented.

Binational Working Relationships: The Key to Success

When other regions on the globe that share water and other common pool resources look at the governance and historical co-operation in the Great Lakes basin, they are often envious. It is challenging for those whose day-to-day professional life involves working across jurisdictions in the Great Lakes region to fully appreciate the value of sustained binational engagement here, but it cannot be underestimated. In the introduction to this collection, Clamen and Macfarlane ask if the Boundary Waters Treaty and its primary institution, the IJC, provide a pioneering model of bilateral co-operation. As they note, the discussion of IJC's role, as reflected in the literature, provides "disparate and competing" interpretations of the treaty's and the commission's saliency. However, on the whole, the treaty, the processes it engendered, and its institutions, including the agreement, have enabled better bilateral relations at the operational level for water resource managers in the United States and Canada, especially in the water quality realm.

With antecedents in the 1912 pollution reference, and the Connecting Channels and Lower Lakes References in the 1940s and '60s, respectively, parity of US and Canadian representation and regular interaction of all parties—state and federal—was codified into the joint institutions outlined in the 1972 agreement. This included not just the advisory boards,

but also the Great Lakes Regional Office located, after much debate, in Windsor, Ontario. The IJC's professional Great Lakes staff was also recruited in equal numbers from each country, similar to the binational complexion of the Water Quality Board and the Research Advisory Board. Binational parity extended to assignments of board secretaries—one each from the US and Canadian technical staff—and the tradition that the office directorship is a four-year, term-limited appointment that rotates between US and Canadian candidates.[35]

This binational parity and engagement did not appear out of nowhere, nor did it evolve in isolation. For example, other regional institutions addressing the shared resources of the Great Lakes, such as the Great Lakes Fishery Commission and the Great Lakes Commission, were important inter-state and binational forums for otherwise parochial resource managers, policy-makers, and public officials to interact and engage with colleagues from jurisdictions spanning the region. However, the IJC was the first such body to operate with jurisdictional parity and, arguably, set the stage for these other organizations. And while some communication and collaboration with the agencies immediately adjacent to a state or province could be anticipated in normal resource management operations, these broader regional forums offered regular opportunities for people from one end of the region to meet and learn from their counterparts at the other end of the basin and from across the international boundary.[36]

For the Great Lakes water quality community involved in IJC activities between 1950 and 1972, there were many joint efforts, such as participating at meetings of the Technical Advisory Boards on Pollution Control, and working on the Lower Lakes Reference given the commission in 1964. Additional opportunities arose from the ongoing water quality work, such as briefing and accompanying state and provincial political leaders to the 1970 governors and premiers summit on the emerging Great Lakes agreement. All these activities provided formal and informal opportunities for members of this relatively small community to meet and talk, to share common experiences, work together to solve common challenges, and generally evolve a perspective that was more regional and "Great Lakes" in scope, than state or provincially focused.

This broader Great Lakes perspective is considered an important element of the initial effectiveness and success of the IJC's Water Quality

Board. When asked to comment on the experience of being on, or working with, the initial Water Quality Board, several regional leaders identified three keys to the board's success. These are the fact that board members were senior appointees who regularly attended meetings, and who were capable of making commitments on behalf of their agencies; strong technical support from both seconded agency staff and IJC staff in the Great Lakes regional office; and perhaps most important, the board member's commitment to the greater good of the Great Lakes. Leaders recalled the "overriding commitment" on the part of board members that they "were there to protect the lakes and everyone [on the Water Quality Board] wanted to do that."[37] This binational structure therefore worked like a positive feedback loop—senior, committed people deliberated on the strong technical work of a series of sub-committees, considered the actions that would be necessary to address problems identified by the sub-committees, and committed their governments to undertaking those actions.

Conclusion

Signing the 1972 Great Lakes Water Quality Agreement was clearly a landmark event in the United States–Canada relationship. It was the first time president and prime minister committed to address the water quality woes of the Great Lakes as a joint endeavour worthy of executive-level agreement. We should not be tempted, however, to view it in isolation and consider it the pinnacle of our two countries' interactions in Great Lakes water quality. Instead, we can see that the 1972 agreement reflects all that went before and is foundational to what has occurred since.

The agreement incorporated important concepts and structures that were initially proposed after the first pollution reference and subsequently evolved over the twentieth century. It also institutionalized inter-state/provincial and federal interactions, the value of which was clear from the number and type of inter-state/provincial and federal interactions that occurred through the Connecting Channels and Lower Lakes References, as well as through appointment and participation on the Technical Advisory Boards on Pollution Control. These are the kinds of opportunities and processes that will be beneficial to sustain or revive going forward. Opportunities for agency personnel to formally and, more importantly,

informally interact with each other in person, is key to sustaining a larger, supra-state or national "Great Lakes" identity. The value of these kinds of meetings in fortifying a shared commitment to the larger Great Lakes basin, its ecological and economic health, cannot be overstated. In the end, the many entities with responsibility for protecting and enhancing Great Lakes water quality will benefit from this shared vision.

Notes

1 This chapter is based on previously unpublished research, as well as nearly twenty years' worth of work on water quality issues and binational governance on both sides of the border. See Jennifer Read, "Addressing 'A quiet horror': The Evolution of Ontario Pollution Control Policy in the International Great Lakes, 1909–1972" (PhD diss., University of Western Ontario, 1999).

2 See Jamie Benidickson, "The IJC and Water Quality in the Bacteriological Age" (chapter 3 in this volume). The assessment that this was the largest bacteriological investigation comes from Mary Durfee and Susan T. Bagley, "Bacteriology and Diplomacy in the Great Lakes, 1912–1920" (paper presented at the biennial meeting of the American Society for Environmental History, Baltimore, MD, 6–9 March 1997).

3 International Joint Commission (IJC), Library and Archives (Ottawa), Docket 4-3-1:1, IJC to the Secretary of State for External Affairs and the Secretary of State, 6 October 1920, 1–6.

4 Government of Canada (Canada), Commission of Conservation. *Conservation* VIII (October 1919), 41.

5 IJC, Docket 4-3-1:1, Frank B. Kellog to His Majesty's Ambassador at Washington, 8 February 1926.

6 Canada, Department of External Affairs, vol. 2644, file pocket 2871-40C, T. M. Patterson, Chronological Review of Negotiations re. Proposed Convention between Canada and the United States with respect to the Pollution of Boundary Waters and Waters Flowing Across the Boundary from August 1, 1912 to October 25, 1929," 1 October 1937, 8–12.

7 Ontario Archives (OA), Water Resources Branch, ACC 1988-89/059, box 27, file 7858-1, vol. 1, L. J. Burpee, "Memorandum for Mr. Magrath," no date, 6; and "Confidential memorandum for Mr. Magrath," no date, 8.

8 Library and Archives (LAC), IJC Docket 4-3-1:1, "Draft of a Convention to Prevent the Pollution of Boundary Waters Between Canada and the United States, 1926," Article II.

9 Draft Convention, Article II. Hereafter, "Convention."

10 Canada-United States. "Agreement between the United States and Canada on Great Lakes Water Quality," Article VI, 1, a-d, 15 April 1972. Hereafter, "Agreement."

11 Agreement, Article IV, 3.

12 Agreement, Article VI, 3. The "standing reference" concept is widely discussed among "old guard" Great Lakes folks, usually over beer after a long day at a conference, and specifically identified in Allan Schwartz, "The Management of Shared Waters: Watershed Boards Past and Future," in *Bilateral Eco-politics: Continuity and Change in Canadian-American Environmental Relations*, ed. Phillipe LePrestre and Peter Stoett (Routledge: London, 2006), 133–44.

13 IJC, *Final Report of the International Joint Commission on the Pollution of Boundary Waters Reference* (Washington, DC: Government Printing Office, 1918), 51–2.

14 Ibid., 28.

15 Convention, Article V.

16 Agreement, Article V, Annexes 3 and 4.

17 Ontario Board of Health, *Forty-fifth Annual Report of the Department of Health Ontario, Canada for the year 1925* (Toronto: King's Printer, 1927), 14, and Department of Health, *Third Annual Report of the Department of Health Ontario, Canada for the Year 1927* (Toronto: King's Printer, 1928), 44.

18 In Ontario the provincial Department of Health lost a significant amount of personnel, which affected its ability to evaluate and approve water and sewerage system construction projects and oversee operation of plants that did exist. See, for example, Ontario Department of Health, *Report of the Board of Health*, "Division of Sanitary Engineering" (Toronto: King's Printer, 1932–6 inclusive).

19 IJC, *Report of the International Joint Commission United States and Canada on the Pollution of Boundary Waters* (Washington, DC: Government Printing Office, 1951), 18–19.

20 Ibid.

21 Don Scavia, personal communication, 25 February 2019.

22 World Health Organization, *Cyanide in Drinking Water: Background document for the development of WHO Guidelines for Drinking-water Quality* (Geneva, CH: WHO Press, 2007), 3.

23 Ibid., 18.

24 Ibid. 18–19; IJC, Docket 54-3-1:4 "Correspondence – 1948," internal IJC document, "Phenols."

25 Agreement, Article II.

26 Agreement, Article I.

27 Agreement, Article III, and Annex 1.

28 IJC, Docket 54-2-2:1 "Transcript of Hearings in Detroit, 28 June 1948," 165–7, and Docket 54-2-2:10 "Transcript of Hearings – Windsor and Sault Ste. Marie, Ontario 19-22 November 1948, vol. 2," 418.

29 *Pollution of Boundary Waters* (1951), 18. Specific complaints about tainted flavours and odours came from municipal drinking water system operators as well as processed food and distilling industries, especially those with water intakes downstream of Sarnia, Ontario. See IJC, Docket 54-2-2:1 "Transcript of Hearings in Detroit, 28 June 1948," 29–33, and Docket 54-2-2:9 "Transcript of Hearings in Windsor, 17-18 November 1948, vol. 1," 130–5, 154–5, 228–30, 233. and 245–6.

30 Agreement, Article III.

31 *Pollution of Boundary Waters* (1951), 21–2.

32 In writing the 1951 report, the commissioners referred to the "reasons which impelled the Governments not to take action which had been indicated in the draft treaty (convention) proposed by the commission after the first investigation [into] pollution." Unfortunately, they did not elaborate on specific reasons. And I was unable to find any additional insights in IJC and federal memoranda related to the 1926 convention. This discussion during an executive session in 1953 is the only clear indication that there may have been political reasons for letting the convention lapse. See IJC, Docket 54-2-5:1 "Executive Session, Ottawa, Canada, 8 October 1953," 33.

33 LAC, MG 55/30, file 208, "1983 Interview with Dr. A. E. Berry, Public Works Engineer, Conducted by Norman Ball, Public Archives of Canada, and Robert G. Ferguson, Metropolitan Works Department, on Behalf of APWA, Ontario Chapter."

34 Agreement, Article VII.

35 John Gannon, interview with author, 1 March 2018, and J. P. Bruce, personal communication, 21 March 2018.

36 The Great Lakes Basin Commission and the Great Lakes Commission were two important political and institutional influences on the implementation of the GLWQA. They helped to maintain political and technical/governmental focus on Great Lakes issues. These institutions were particularly important in offering formal, institutional arrangements with an explicit Great Lakes basin perspective and were important in getting the US states used to working together in a collective fashion on selected basin-wide issues. Also, these institutions reinforced the bilateral perspective as Canadian federal and provincial agencies were offered observer status at these institutions and participated fully in discussions. See Jennifer Read, "An analysis of the intellectual and political influences on the *Great Lakes Water Quality Agreement*s of 1972, 1978 and the 1987 Protocol," report prepared for the IJC Great Lakes Regional Office, Windsor, ON, July 2005.

37 Confidential personal communication with former IJC staff member. See also, Jack Manno, "Advocacy and Diplomacy in the Great Lakes: A Case History of Non-governmental Organization Participation in Negotiating the *Great Lakes Water Quality Agreement*," *Buffalo Environmental Law Journal* 1, no. 1 (1993), https://digitalcommons.law.buffalo.edu/belj/vol1/iss1/1/; and Lee Botts and Paul Muldoon, *The Great Lakes Water Quality Agreement*: *Its Past Successes and Uncertain Future* (Hanover, NH: Institute for International Environmental Governance, Dartmouth College, 1996).