

## BORDER FLOWS: A Century of the Canadian-American Water Relationship

Edited by Lynne Heasley and Daniel Macfarlane

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# Dam the Consequences: Hydropolitics, Nationalism, and the Niagara–St. Lawrence Projects

DANIEL MACFARLANE

## Introduction

For first-time visitors to Niagara Falls, it can be difficult to find the actual waterfall, at least when approaching from the eponymous Ontario city. After running the gauntlet of Clifton Hill attractions, casinos, and souvenir stands, one of the few roads descending the Niagara gorge (or the incline railway tucked behind a hotel) still needs to be located. As the falls come into view, tourists assume they have exchanged the artificial and constructed for the natural and untouched; if only they knew that the great cataract has been built and shaped to no less a degree than the surrounding tourist traps. Then again, given the banality of the carnivalesque at this North American landmark—what with its tightrope walkers, erupting mini-golf volcanoes, barrels going over the falls, and so on—perhaps this should come as no surprise.

Indeed, the waterfalls at Niagara are themselves a type of infrastructure that was remade over the course of the twentieth century. The same is true of the St. Lawrence River farther downstream. In fact, much of the upper St. Lawrence is not even a river anymore, but a lake. The Niagara and

St. Lawrence Rivers are both key transportation links in the Great Lakes–St. Lawrence system, as well as the most prominent rivers that form—rather than cross—the border between Canada and the United States, and between Ontario and New York. Both river systems are iconic cultural waterscapes. The St. Lawrence River—which starts at Lake Ontario and carries the waters of all the Great Lakes before emptying into the Atlantic Ocean—was the historical water highway for the area that would become the Canadian state. Niagara Falls, which is made up of the larger Horseshoe Falls and the smaller American Falls, has in the past been held up as the North American epitome of the natural sublime. And, of course, both waterways were modern centres of industrial and hydroelectric development.

Niagara and the St. Lawrence are connected physically and conceptually. Measures to physically alter Niagara Falls were part of the diplomatic negotiations, stretched over the first half of the twentieth century, to build a St. Lawrence deep waterway. The 1950 Niagara Diversion Treaty authorized bilateral engineering works—the International Niagara Control Works—that enabled huge amounts of water to be diverted and used downstream at hydroelectric power stations, while also manipulating the river and waterfalls in order to maintain their scenic appeal. The St. Lawrence Seaway and Power Project, made legally possible by a 1954 diplomatic agreement, involved a deep-draft canal system stretching from Montreal to Lake Erie in conjunction with a massive hydroelectric project.

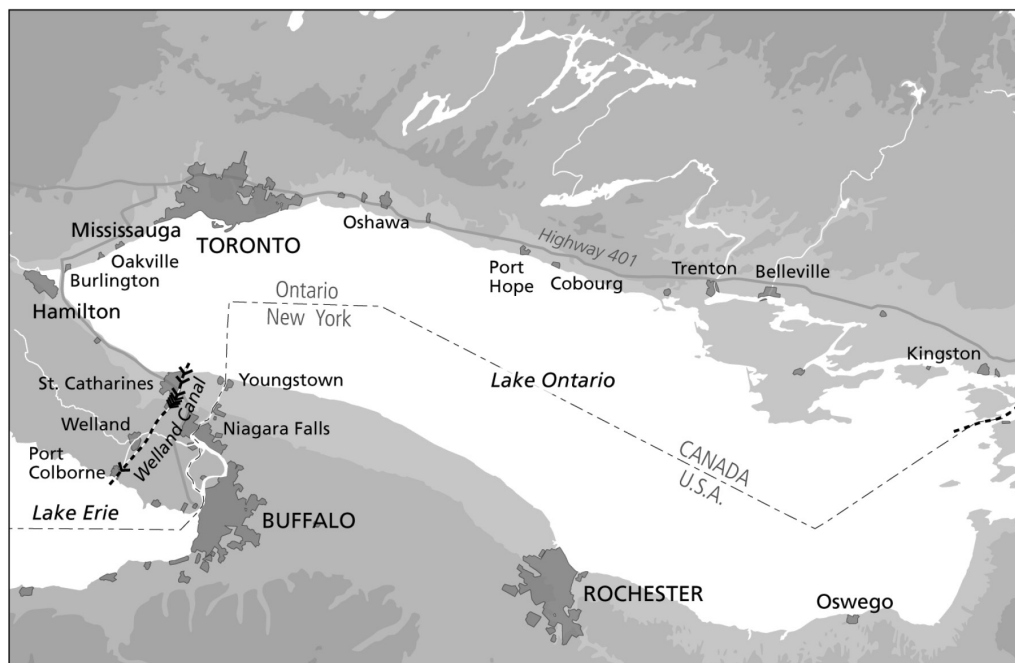
The power aspects of both of these megaprojects were built mostly by the same governments and planners in the 1950s (i.e., the Power Authority of the State of New York and the Hydro-Electric Power Commission of Ontario) utilizing many of the same engineers and workers. Moreover, both water systems were intimately tied to wider ideas about national development and the sublime, both natural and technological. Directly contrasting these two projects allows for unique insights about the North American manipulation of border waters in the early Cold War era. Niagara and the St. Lawrence developments up to the 1950s suggest shared approaches to water, nature, and technology; at the same time, these megaprojects simultaneously reveal important differences in Canadian and American conceptions of these borders waters and the links between national/regional identity and natural resources.<sup>1</sup>

## Negotiations

Canadian-American negotiations for the eventual St. Lawrence undertaking began in the late nineteenth century and continued episodically until the project was built in the 1950s. A number of natural obstacles required many pre-twentieth-century “improvements” to the navigability of waters on, and connected to, the Great Lakes–St. Lawrence waterway, such as the Welland Canal, to avoid Niagara Falls, and the Soulanges/Beauharnois, Williamsburg, and Lachine Canals, to bypass rapids on the St. Lawrence River. Since the St. Lawrence forms the border between New York and Ontario, before running fully in Canadian territory through Quebec, as of 1909 (the year of the Boundary Waters Treaty, which created the International Joint Commission) bilateral cooperation was legally necessary if the St. Lawrence was to be turned into a deep-draft waterway. In the early twentieth century, Canada and the United States bandied back and forth proposals to further canalize the St. Lawrence. By the 1920s serious engineering studies were underway, and the idea of wedding a deep waterway to a hydro project had been cemented.

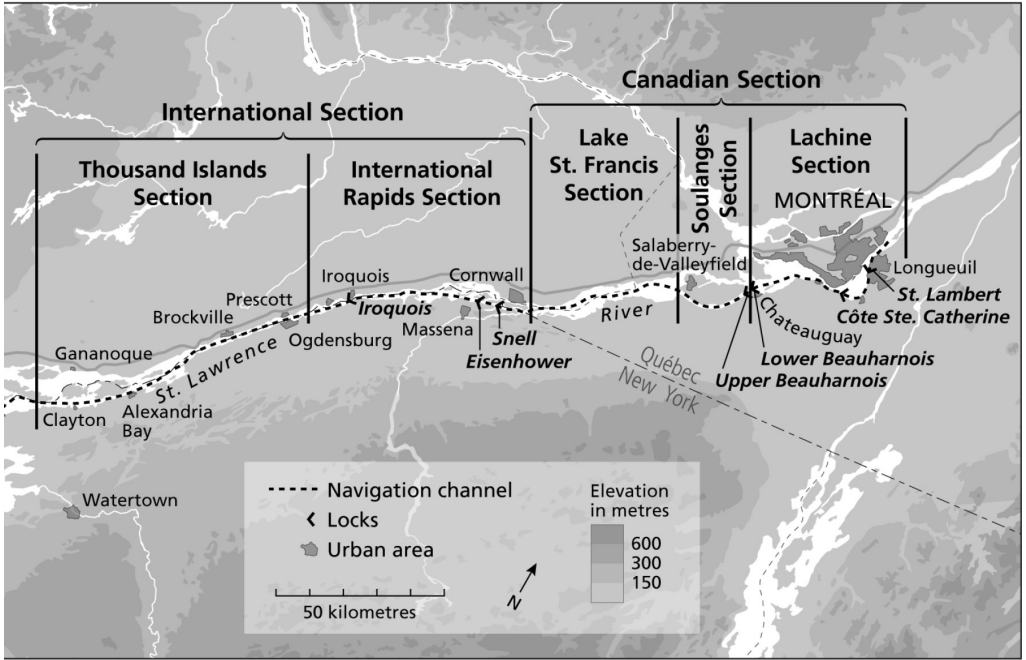
Transnational talks about improving the St. Lawrence tended to also include plans for comprehensive development of the connecting channels of the Great Lakes, such as the Niagara River. Large-scale hydroelectric production and distribution was born at Niagara Falls in the late 1800s. The many power stations and factories operating by the time of the Boundary Waters Treaty diverted water away from the Horseshoe and American Falls. The tailraces belched water down the sides of the gorge, and to those who equated industrial power with beauty, these channelled plumes were more attractive than the actual waterfall. At first, however, most of the power produced on the Canadian side was exported across the border, because the companies tended to be American-owned, despite their Canadian-sounding names.

Before the end of the nineteenth century, worries had already been raised about the aesthetic impact of the industry that crowded the shoreline to take advantage of the water power; of equal concern were the decreased water flows resulting from the diversions funnelled to the factories and power station. The reduced water volume detracted from the visual appeal, as did the natural process of erosion that had for eons steadily caused the falls to recede upstream. Both the American Burton Act (1906) and the



4.1 St. Lawrence Seaway. Map by Eric Leinberger. Reproduced with permission of University of British Columbia Press.

bilateral Boundary Waters Treaty put restrictions on the amount of water that could be diverted away from the falls. The latter limits were lifted during World War I, but then reinstituted afterward—though not always adhered to. In response to public worries about the scenic grandeur and diversions, Canada and the United States formed the International Niagara Board of Control in 1923, followed by a Special International Niagara Board in 1925. Based on the recommendations of the latter, the two countries signed the Niagara Convention and Protocol in 1929.<sup>2</sup> It called for remedial works that would disperse water to ensure an unbroken crest line in all seasons while reducing erosion rates, and it permitted each country experimental diversions of 10,000 cubic feet per second (cfs) from the Niagara River above the falls for seven years during the period from October 1 to March 31. However, the 1929 convention was not able to make it through the U.S. Senate, for it granted too much to private power interests;



indeed, the scenic aspect of the agreement had been included largely to curry public favour for increasing diversions.

Was it the height, width, volume, colour, or lines that made Niagara Falls such a spectacle? In 1931 the Special Niagara Board released a report titled “Preservation and Improvement of the Scenic Beauty of the Niagara Falls and Rapids.” The report’s sections on colour were fascinating, and a special “telecolourimeter” was developed to test for the desired “greenish-blue” hue, which was considered superior to the whitish colour resulting from a thin flow over the precipice. The excessive mist and spray at the Horseshoe Falls was considered a turnoff because it obscured the view and, unsurprisingly, made people wet. The denuded bare rock at the flanks of the falls was labelled as one of the greatest detriments to the visual appeal, while erosion threatened to ruin the “symmetry” of the falls.





4.2 Mosaic of Proposed Niagara Remedial Works, c. 1935. Courtesy of Library and Archives Canada.

The report concluded that a sufficiently distributed volume of flow, or at least the “impression of volume,” which would create an unbroken crest line, was most important. The board therefore recommended that the riverbed above the falls be manipulated in order to apportion the volume of water necessary to achieve the desired effect. Remedial works, in the form of submerged weirs and excavations, would achieve that while allowing for increased power diversions. This report, along with the 1929 convention, would serve as the conceptual basis for subsequent attempts in the following decades to deal with the tension between beauty and power at Niagara; the waterfalls were to be treated essentially as a tap, turned on and off according to aesthetic whims and power needs.

At the same time, St. Lawrence Seaway discussions were heating up, culminating in the Great Lakes Waterway Treaty. This treaty, signed in July 1932, authorized a deep waterway from the head of the Great Lakes to Montreal as well as hydro development in the St. Lawrence River. The treaty also dealt with a range of boundary water issues in the Great Lakes–St. Lawrence basin, including Niagara Falls and other Great Lakes diversions whose water could be utilized at Niagara, such as those at Chicago and Long Lac–Ogoki.<sup>3</sup> These were tit-for-tat; basically, Long Lac–Ogoki diversions into Lake Superior would make up for the water lost by the Chicago diversion. The 1932 treaty, however, failed to pass the U.S. Congress due to the range of interests opposed to the project. After all, why would railway magnates, and the votes they held in their pocket, want government-subsidized competition?

The Niagara landscape was nonetheless altered in other ways. For example, in 1921 the Hydro-Electric Power Commission of Ontario (HEPCO) brought online the first turbine of a new power plant, Sir Adam Beck No. 1 (the world's largest hydroelectric plant when it was completed in the 1930s). The plant diverted water via a canal starting above the falls that required the flow of the Welland River to be reversed. In addition to building a parkway and making other aesthetic improvements, Canada also reconfigured Table Rock in the 1930s by blasting off a large overhanging section. At about the same time, in the United States the Roosevelt administration decided to withdraw the still-unratified 1929 Niagara convention from Senate consideration and fold the Niagara issue into a new comprehensive agreement to deal with all Great Lakes–St. Lawrence basin navigation, power, and diversion issues.<sup>4</sup> But Ontario Premier Mitch Hepburn was obstreperously opposed, wanting Niagara development separate from the rest.

The onset of World War II changed the picture dramatically. Because of the need for power created by the conflict, Hepburn reversed his opposition to St. Lawrence development.<sup>5</sup> Roosevelt was now the more reluctant partner, because he would have to face the electorate in 1940. To help compensate for this delay, Roosevelt consented to Ontario undertaking the Long Lac–Ogoki diversions into the Great Lakes watershed and utilizing up to 5,000 cfs of the resulting extra water for hydro production downstream at Niagara Falls stations.



Canada and the United States decided to give a St. Lawrence agreement another try, covering the same ground as in the previous 1932 St. Lawrence treaty and 1929 Niagara treaty. On March 19, 1941, Canada and the United States entered into the Great Lakes–St. Lawrence Basin Agreement, an executive agreement rather than a treaty. This agreement created the Great Lakes–St. Lawrence Basin Commission to oversee construction of a twenty-seven-foot waterway in conjunction with a hydro dam in the International Rapids section of the St. Lawrence River. In addition to stipulating limits for the Chicago diversion and parameters for other diversions into the Great Lakes–St. Lawrence watershed, Article IX of the 1941 agreement provided for the construction of remedial works in the Niagara River, as well as means of testing their utility and authorization for immediate diversions of 5,000 cfs per side. But the Canadian-American St. Lawrence agreement also failed to receive the assent of Congress—a constant refrain in the St. Lawrence story—largely because of the entrance of the United States into World War II.

Nonetheless, the two countries agreed that the limits on the amount of water diverted at Niagara Falls could be temporarily increased for war-time needs: 5,000 cfs for the United States (to be followed by another 7,500 cfs) and 3,000 cfs for Canada. By June 1941, diversion of the extra water had begun, and subsequently, further withdrawals were allowed during the war, rising to a total diversion of 54,000 cfs for Canada and 32,500 cfs for the United States. In early January 1942, the two countries agreed to split the cost of constructing remedial works above the falls, with HEPCO as the responsible Canadian entity and the U.S. Army Corps of Engineers handling the American share. These works took the form of a stone-filled weir—a submerged dam—in the Chippawa–Grass Island Pool above the falls, which raised the water level about a foot in order to facilitate greater diversions while preventing an apparent loss of scenic beauty.<sup>6</sup>

## Postwar Agreements

The wartime Niagara diversions continued indefinitely after the end of the war. In 1948, Canada and the United States exchanged notes endorsing a 4,000 cfs diversion at the falls, and another 2,500 cfs diversion from Queenston to DeCew Falls during the non-navigation winter season. The two

countries continued to deal with Niagara diversion issues separate from the repeatedly stalled St. Lawrence issue, and a Niagara Diversion Treaty was signed in February 1950. This Canadian-American accord called for more comprehensive remedial works, to be approved by the International Joint Commission (IJC), and virtually equalized water diversions while restricting the flow of water over Niagara Falls to no less than 100,000 cfs during daylight hours (during what it deemed the tourist season: 8:00 a.m. to 10:00 p.m. from April to mid-September, and from 8:00 a.m. to 8:00 p.m. in the fall) and no less than 50,000 cfs during the remainder of the year. This worked out to Canada and the United States collectively taking, outside of tourist hours, three-quarters of the total 200,000 cfs flow of the Niagara River that would otherwise plummet over the falls, and approximately half of the total flow during tourist hours.<sup>7</sup>

In the immediate postwar years a variety of economic and defence factors brought further pressure to bear on a St. Lawrence Seaway and Power Project: the need for hydroelectricity for industrial and defence production, the ability of a deep waterway to transport the recently discovered iron ore deposits from the Ungava district in Labrador and northern Quebec, the possibility of protected inland shipbuilding on the Great Lakes, and the economic and trade stimulation that a seaway would bring. Additionally, the United States proposed that a seaway could pay for itself through tolls, which Canada eventually agreed to in 1947.

But the 1941 St. Lawrence agreement remained stalled in the U.S. Congress. In 1949, with Ontario experiencing major power shortages, the Liberal government of Louis St. Laurent realized that an “all-Canadian” waterway might be feasible and would not need the permission of the United States because it would not substantially change boundary water levels. But an all-Canadian seaway was viable only in conjunction with an Ontario–New York power dam. In 1948, both New York and Ontario had asked their respective federal governments for permission to forward to the IJC a “power priority plan” whereby the province and state would build a hydro dam separate from a deep waterway system. This scheme had initially been opposed by both President Harry Truman and Prime Minister St. Laurent. But, since this Ontario–New York plan would accommodate the all-Canadian waterway approach, the Canadians reversed their position.

Ottawa began taking steps to condition public opinion on both sides of the border for the possibility of an all-Canadian seaway coupled with an

Ontario–New York power project. A waterway entirely in Canadian territory quickly resonated with Canadians and the idea continued to build momentum throughout the 1950s; in fact, the government's campaign soon boomeranged, for the St. Laurent government then felt strong pressure to pursue a wholly Canadian waterway in order to satisfy popular opinion. An all-Canadian seaway, however, clearly threatened important American national security and economic interests. How could the leading country in the world let Canada control who came into the American backyard? Truman was opposed to the St. Lawrence project unless it proceeded as a joint Canada-U.S. endeavour. The president also favoured federal, rather than state (i.e., New York State), development of the hydro power.

The New York share of the hydro works, to be built by the Power Authority of the State of New York, needed a license from the U.S. Federal Power Commission (FPC). But the commission refused to grant a license. Although the FPC was supposedly free of partisan political influence, its commissioners were presidential appointees. It was clear that the White House was impacting the FPC's decision, and would continue to do so. To be fair, American interference was also partially the result of Washington's misreading of Canada's intentions to proceed alone with the waterway—a situation to which Ottawa had contributed by sending mixed messages about its commitment to proceed unilaterally. Since the hydroelectric works were needed to make a Canadian waterway a reality, Ottawa was essentially caught in a catch-22. The Canadian government tentatively left the door open to American participation in the hopes that doing so would allow the hydro aspect to commence. Dwight Eisenhower, who became president in January 1953, was noncommittal about the seaway until several months into his term. The Eisenhower cabinet finally came out in favour of American participation in May 1953, primarily for defence reasons. The FPC—surprise, surprise—quickly approved a license for New York. However, sectional and regional interests then conspired to exploit the appeals process so as to further hinder a start on the St. Lawrence project until 1954, when Congress finally approved American participation via the Wiley-Dondero Act.

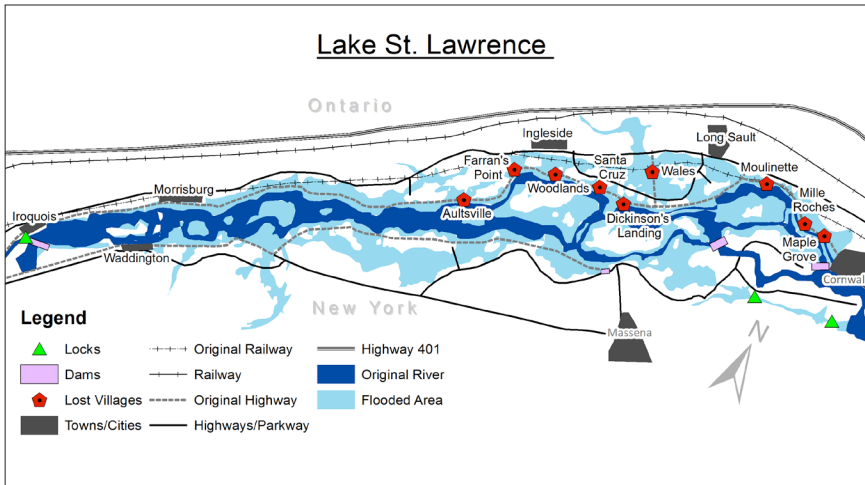
In the end, Canada's prime minister consented to American involvement, chiefly because of the likely negative ramifications for the Canadian-American relationship if Canada resisted. Through a 1954 bilateral St. Lawrence agreement, Canada reluctantly acquiesced in the construction

of a joint project—but not before it extracted certain concessions from the United States during the ensuing negotiations, such as the placement of the Iroquois lock and Ottawa’s right to later build an all-Canadian seaway if it so desired.

## Construction

The construction of the St. Lawrence Seaway and Power Project wrought huge changes in the St. Lawrence basin.<sup>8</sup> But that probably goes without saying, since an enormous river was being channelized and transformed into a reservoir-cum-lake. In excess of 210 million cubic yards of earth and rock—more than twice what was involved in building the Suez Canal—were moved through extensive digging, cutting, blasting, and drilling, using a plethora of specialized equipment and enormous machines. Approximately 110 kilometres of channels and locks were built and others re-routed, and even more kilometres of cofferdams and dikes were required. The entire project was completed on schedule, which, given its magnitude, was an amazing feat. Dubbed the “greatest construction show on earth,”<sup>9</sup> the St. Lawrence project required three new dams: the Moses-Saunders powerhouse, the Long Sault spillway dam, and the Iroquois control dam. The third regulated water levels on Lake Ontario and the portion of the St. Lawrence River to the west of Iroquois, while the Long Sault dam helped control water levels at the eastern end of the newly created Lake St. Lawrence. The Moses-Saunders powerhouse, a gravity power dam with thirty-two generator units that generated a combined 1.8 megawatts, was a bilateral project, with the Canadian and American halves bisected by the international border. The seaway cost \$470.3 million (Canada paid \$336.5 million; the United States, \$133.8 million). Including the cost of the power phase, the bill for the entire project was over \$1 billion.

In order to construct the new power dam, the International Rapids section of the river had been dried out through extensive cofferdamming. On July 1, 1958, some twenty thousand people gathered for “Inundation Day” to witness the creation of Lake St. Lawrence. Some twenty thousand acres of land on the Canadian side, along with another eighteen thousand acres on the American shore, were inundated. Because of differing population densities, relatively few Americans were directly affected compared



4.3 Lake St. Lawrence and Lost Villages. Map by author.

to the Canadian side. In addition to land in Ontario—where the seaway displaced 6,500 people in nine communities (often referred to as the Lost Villages) as well as farms and cottages—the seaway also submerged property in two Mohawk communities and southwestern Quebec.<sup>10</sup> Over one hundred kilometres of the main east–west highway and railway in Ontario had to be relocated, as did other infrastructure such as bridges and power lines, especially in the Montreal area. So as not to create navigation and other difficulties at the bottom of the new lake, *everything* had to be moved, razed, or flattened, including trees and cemeteries.<sup>11</sup> One would not want to run a boat onto a submerged chimney or tree—or gravestone. Since most of this rehabilitation work was in Ontario, HEPSCO was responsible for compensating those who were relocated, which required an enormous logistical and public relations effort. A number of people chose to transport their houses via special vehicles to the new communities created to house the displaced residents, Ingleside and Long Sault, or the towns that were pushed north to accommodate the new shoreline, Iroquois and Morrisburg. While many relocatees bought into the idea that they were sacrificing for progress and benefitting in terms of material living conditions, for others the relocation took an enormous psychological and



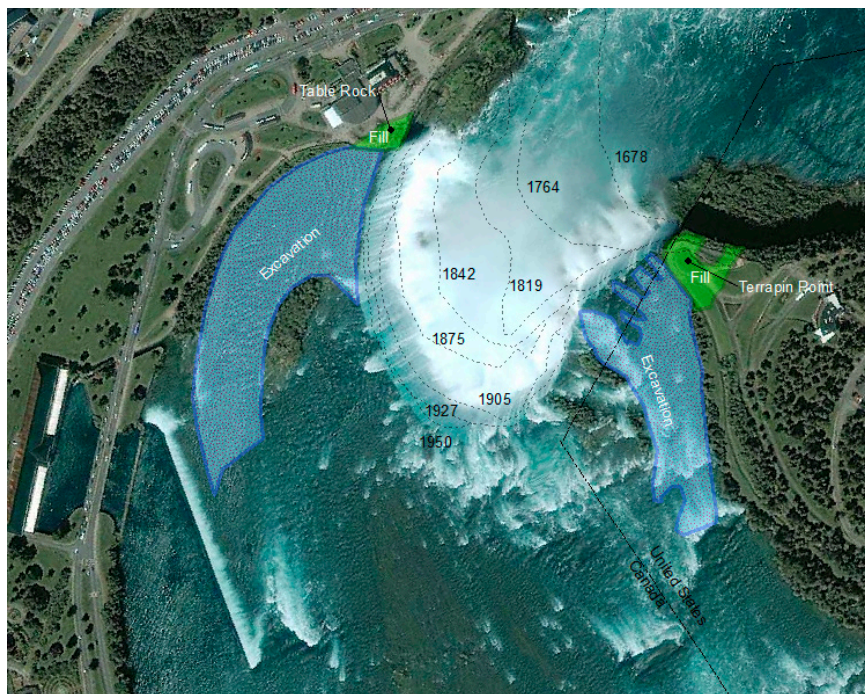
4.4 Ingleside after inundation. Reproduced with permission of Lost Villages Historical Society, Long Sault, Ontario.

emotional toll.<sup>12</sup> Compensation for a sentimental attachment to a location, or the omnipresent sound of the rapids, was a tricky business.

After U.S. Senate approval, the Niagara treaty came into force in October 1950. It was then referred to the IJC, which subsequently created the International Niagara Falls Engineering Board. Studies by this board showed that, without remedial works, the diversions authorized in the 1950 treaty would have a very negative impact on the scenic beauty of the area: the Chippawa–Grass Island Pool level would drop by as much as four feet, exposing areas of the riverbed, turning the American Falls into an unsightly spectacle, and greatly marring the appearance of the flanks of the Horseshoe Falls.<sup>13</sup> In 1953 reports by the IJC and International Niagara Falls Engineering Board, the objectives remained basically the same as they had been in the 1920s: to ensure the appearance of an







4.6 Horseshoe Falls showing rate of recession, crest fills, and flank excavation. Map by author.

unbroken and satisfactory crest line while allowing for the diversion of water for power production.<sup>14</sup>

The cost of the total Niagara remedial works was estimated at about \$17.5 million, but it ending up totalling around \$12.5 million when finished in 1957.<sup>15</sup> A 1,550-foot control structure extended in a straight line from the Canadian shore, parallel to and about 225 feet downstream from the weir built in the 1940s, eventually featuring eighteen sluices equipped with control gates. The purpose of this structure was to control water levels and spread out the water, for appearance and because flows concentrated in certain places caused more erosion damage. Excavation took place along the flanks of the Horseshoe Falls (64,000 cubic yards of rock on the Canadian flank; 24,000 cubic yards on the American flank) in order to create a better distribution of flow and an unbroken crest line at all times.

To compensate for erosion, crest fills (100 feet on the Canadian shore and 300 feet on the American side) were undertaken, parts of which would be fenced and landscaped in order to provide prime public vantage points.<sup>16</sup>

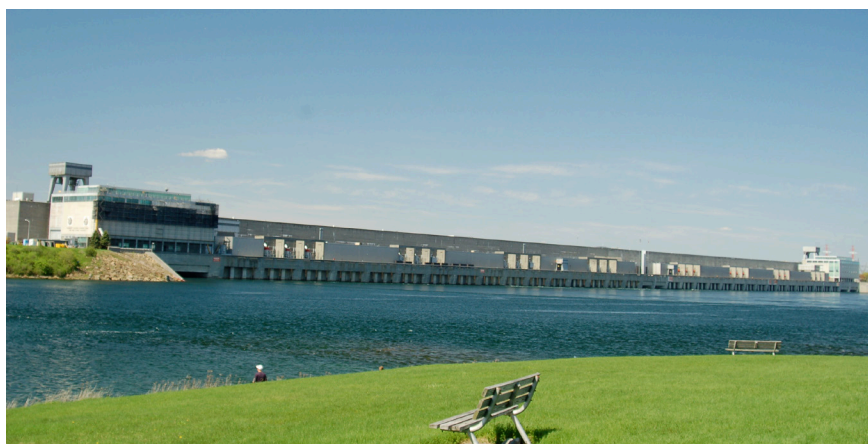
## Water, Technology, and Nationalism

The history of developments on both the St. Lawrence and Niagara is indicative of a North American confidence in the ability of technology to control, tame, and exploit the natural environment, an impulse that took on even more urgency as the Cold War dawned after 1945. Because of the strategic security roles of the St. Lawrence and Niagara projects—both created necessary electricity, and the seaway added additional continental security value—they represented state-building enterprises that served as physical defences against the growing threat presented by the Soviet Union. Fascination with the “technological sublime” was intimately intertwined with Cold War symbolism in Canadian and American attempts to assert the nature of capitalist democracies as more progressive, modern, and powerful than that of communist nations.<sup>17</sup>

Both states—along with their respective bureaucracies and experts—displayed key characteristics of high modernism. High modernism is essentially the hubristic twentieth-century idea that governments and their experts and bureaucracies had the infallible knowledge, technology, and power necessary to control society and the environment and could do so with such expertise that they need not fear any repercussions.<sup>18</sup> As a state-building exercise controlled by centralized bureaucracies with the aim of reordering both the natural environment and society for the sake of progress, the St. Lawrence and Niagara schemes certainly fit key elements of high modernism. But the high modernist concept, generally applied to nonauthoritarian states, needs to be contextualized and modified when applied to historical Canadian and American subjects. A number of scholars have already done so in the Canadian context.<sup>19</sup> I suggest that we see in post-World War II North America what can be called *negotiated* high modernism: in order to dominate and control both nature and society, Canadian and American governments had to repeatedly adapt, negotiate, and legitimize themselves and their grand schemes to those they governed.<sup>20</sup>



4.7 Moses and Beck power stations. Photo by author.



4.8 Robert Moses generating station. Photo by author.



Niagara is a unique high modernist case because, rather than seeking to visually dominate the natural setting, as did the St. Lawrence project, the control works at and above the actual cataract were largely hidden (to be sure, the downstream power projects were designed to invoke awe from the general observer). Instead of making the technology obvious, they were designed to be unseen. This can be partially explained pragmatically—Niagara Falls had to continue to look like itself, or at least some idealized version of itself—and the states' interest in Niagara's beauty can be boiled down to tourism dollars. But it also speaks to a different variant of high modernism in which the desire to dominate was so pervasive that technology was not so much imposed on nature; rather, nature itself was controlled to become the technology and thus the beautiful and sublime. The overarching goal was to create an uninterrupted "curtain of water" over the precipice that displayed a pleasing consistency and colour. The remedial works were intended to reduce "spray problems," as excessive mist was scaring visitors away from the tunnels behind Table Rock. All of this speaks to the commodification of the Niagara experience, a process intertwined with the other tourist trappings prevalent at Niagara Falls: nature should be sanitized, made predictable and orderly, and packaged for easy consumption.

It was a manufactured landscape, a hybrid of the real and artificial. Ginger Strand calls Niagara an "in-between" landscape, which is compatible with other concepts that academics have provided for discussing hybrid environments that blended the organic and industrial.<sup>21</sup> The great cataract was reduced to cubic feet per second and linear feet of crest line, a schematic or blueprint where the beauty for the engineers lay in their precision and control over the waterfall. It was to be regulated and fine-tuned to produce maximum beauty and maximum power. The water still flowed over a rock cliff, and thus was natural, but it did not go over the precipice in a natural way. It had been radically altered and modified to suit humanity's tastes. The majority of the Niagara River's water was not even going over the lip of the falls, but passing around to form a different type of waterfall in the penstocks of the Niagara power plants farther down the gorge. There was a transnational willingness to sacrifice the epitome of the sublime for the sake of power and industry.

The creation of both the St. Lawrence and Niagara projects speaks to transborder ideas about technology and environment, but also to the ways



4.9 Partially submerged remains of a Lost Village in the St. Lawrence. Photo by author.

that national identities were bound up in such ideas. The St. Lawrence River was historically seen as a national, rather than a shared, river. This view of the St. Lawrence as a primarily “Canadian” river manifested itself in the attempts for an all-Canadian seaway. The St. Lawrence River holds an exalted and iconic place in the Canadian national imagination, as the river served as the crucible of Canadian settlement and development. The meaning of the river was extended to the seaway. Canadian historiography is replete with notions of the river narrative and aquatic symbolism—Canadians “consider water part of their natural identity,” because “rivers are Canadian cultural icons; they have consistently communicated the idea of Canada, its meta-narrative of nation-building and collective identity.”<sup>22</sup> This is exemplified by the Laurentian thesis, forwarded most prominently by Donald Creighton. In Creighton’s words, “the dream of the commercial empire of the St. Lawrence runs like an obsession through the whole of Canadian history. ... The river was not only a great actuality; it was the



central truth of a religion.”<sup>23</sup> Put simply, the Laurentian thesis holds that the St. Lawrence River was the dominant element in shaping the territorial, political, economic, and cultural evolution of Canada.

A number of other prominent post-World War II historians, such as W.L. Morton and J.M.S. Careless, also pointed to the pivotal role of the St. Lawrence in Canada’s historical development, and many popular histories from the era adopted similar themes and approaches.<sup>24</sup> Historian Janice Cavell argues that “no other interpretation of history has ever been so widely and whole-heartedly accepted [in Canada] as Laurentianism once was” at the height of its popularity, from the 1930s to the 1960s.<sup>25</sup> It is no coincidence that this was also the time period during which the seaway was completed. The Laurentian thesis helped sustain the conception of the St. Lawrence watershed as the defining and fundamental aspect of Canadian history and identity and, in turn, infused the notion of an all-Canadian seaway with the same nationalist importance and symbolism.

The St. Lawrence could serve as both a bridge and a barrier between, alternatively, English and French Canada, and Canada and the United States.<sup>26</sup> The sense of identity with, and ownership of, the St. Lawrence resulted in a fear of American encroachment on the river, particularly in connection with the reaction of Canadian nationalists against their nation’s subservient role as a mere raw-material exporter to the United States. St. Lawrence nationalism had seized Canadians. The St. Lawrence project also fit neatly into the St. Laurent government’s nation-building agenda. An all-Canadian project, along with other contemporary transportation projects such as the Trans-Canada Highway, had nation-building parallels with the transcontinental railways.<sup>27</sup> The seaway effectively served as a conduit for many different expressions of Canadian nationalism, which can be subsumed under the term “hydraulic nationalism.”<sup>28</sup> Incidentally, the seaway never came close to paying for itself, and when we consider factors such as allowing invasive species into the Great Lakes, the seaway should perhaps be characterized as a mistake. Granted, such assessments are complicated, for the resulting hydroelectricity met expectations and the project would have proven very useful had the feared World War III actually occurred.

The desire to dominate the natural world has been well established in American historiography,<sup>29</sup> and various views of the link or dialectic between nationalism, identity, environment, and technology exist in modern

Canadian history.<sup>30</sup> Both Canadian and American identities have strong ties to their respective landscapes and have environmentally determinist forms of explanatory development paradigms: e.g., the frontier thesis in the United States; the metropolitan-hinterland, staples, and aforementioned Laurentian theses in Canada. Yet it has been suggested that Canadians tend to see nature in more antagonistic terms. Some commentators argue that this antagonism stems from the conception of Canada as a small population struggling against a vast, foreboding, cold, and hostile landscape,<sup>31</sup> while other identifiable factors can also serve as partial explanations for differing Canadian and American views of nature.<sup>32</sup>

The argument that “technological nationalism has characterized the Canadian state’s rhetoric concerning identity” is extremely persuasive—from the early Canadian staples trade to railroad building to the St. Lawrence Seaway and Power Project.<sup>33</sup> Hydroelectricity in particular was seen as a means of delivering Canada from its “‘hewer of wood’ servitude to American industry and its bondage to American coal.”<sup>34</sup> Technology was historically seen by Canadian nationalists as the means by which the United States could dominate and control Canada. However, technology was a “double-edged sword”; by the mid-twentieth century, Canadian access to modern technology—which could be used to conquer the hostile environment—held out the potential for the nation to evolve independently of the United States, rather than further integrating the two countries.<sup>35</sup>

Hydraulic and technological nationalism were apparent in both the St. Lawrence and Niagara projects. Patrick McGreevy argues that Niagara resonated with Canadian nationalists for various reasons (many of which could equally apply to the St. Lawrence), including Niagara’s proximity to the Canadian heartland, its connection to the St. Lawrence–Great Lakes system, its sites of Canadian resistance to American encroachment in the War of 1812, and uniquely Canadian views of the environment. Put another way, Niagara Falls was Canada’s front door and America’s back door; again, this metaphor could apply to the St. Lawrence.<sup>36</sup> However, Niagara Falls was more strongly linked to the United States during the nineteenth century, from the Grand Tour to Frederic Church’s iconic painting. In the Canadian consciousness, Niagara Falls was traditionally conceived of as a border water, and though the “better” part of it was in Canada (i.e., Horseshoe Falls), the Niagara River and falls were not seen as “Canadian” to the same extent as the St. Lawrence.

Public pressure seemed stronger on the American side for work to retain the visual quality of the cataract. This can be attributed to Niagara's past association with the American natural sublime, though the American side had been degraded by industry and electrochemical production over the years to a greater extent than had the Canadian share. Granted, support for remedial works was in many ways and for many interests a convenient cover for supporting increased diversion for industrial development—the U.S. federal government and the State of New York were, like the Canadian and Ontario governments, attracted most by the power they could get from Niagara, though this tended to have nationalist motivations for Canada and imperialist motivations for the United States.

Niagara Falls was a Canadian nationalist expression for many of the reasons McGreevy suggests, and his back door/front door metaphor is quite apt for describing the Great Lakes–St. Lawrence border; however, it was the technological control of Niagara Falls for hydroelectric development that resonated most strongly with Canadian nationalists, at least during the early Cold War period. Just as was the case with the St. Lawrence, the hydro power of the Niagara River was a stronger nationalist expression than was its natural beauty, for it represented the full usage of the nation's natural birthright. Though the Niagara works were a joint undertaking with the United States, this partnership was as much a result of practical necessity as of a desire to cooperate. For some Canadians, such technological development and resource exploitation would allow for greater integration with the United States; for others, it was the means by which to distance Canada from reliance on the United States.

## Conclusion

The Niagara and St. Lawrence rivers were replumbed to provide hydroelectricity, navigation, and scenic appeal. Both the federal and the state-provincial governments shared fundamental assumptions about the role of the state in developing and exploiting water resources for the national benefit. Waters running wasted to the sea were to be channelled and made productive, and the state possessed the means to manipulate the environment in many ways. Such ideas also permeated the general public in both countries, as few questioned the logic of the projects, even among those relocated by the St. Lawrence project.

Both of these projects required cooperation between the Canadian and American federal governments, the Ontario and New York governments, and the IJC. The Niagara and St. Lawrence projects are generally portrayed as a testament to bilateral cooperation, which is true, though we should not let the enormous level of integration that resulted from the planning and execution of these massive megaprojects obscure the fact that, during the first half of the twentieth century, their negotiations were defined more by conflict. Moreover, we should not automatically assume that national collaboration is a good thing; from a border river's point of view, whether or not cooperation is positive depends on the end goals. When it comes to pollution and water quality, joint national action—such as the Great Lakes Water Quality Agreements of the 1970s—appears to have been mostly beneficial. But if the purpose is industrial development and the manipulation of water quantity, which was the case with the St. Lawrence and Niagara Rivers, then governmental cooperation appears to be ecologically detrimental, since cross-border coordination leads to the construction of works with major environmental consequences. The St. Lawrence and Niagara Rivers eluded large-scale development and environmental degradation until the second half of the twentieth century precisely because they were border waters; if these rivers had been wholly within one country, they almost certainly would have been dammed and developed decades earlier. Perhaps it is fair to say that, in the Canadian-American context, border waters are more likely to escape—or at least forestall for a longer period—the most catastrophic consequences of industrial exploitation. Put another way, a lack of political cooperation across the border can lead to inadvertent environmental protection on the border.

Nonetheless, the completion of these power/navigation developments further merged Canada and the United States as economic, defence, and cultural allies. The building of both projects was intimately intertwined with Cold War symbolism in Canadian and American attempts to assert the superiority of the Western way of life. However, the historical development of these two megaprojects also reveals differing, even competing, national conceptions of border waters. In both cases, water was perceived as inherent to Canadian identity, and evolving technologies as the means by which Canada could fully embrace its hydrological birthright.

## Notes

- 1 Thanks to the various participants in the 2012 Border Flows workshop for their feedback.  
  
The information and arguments presented here are drawn from larger studies by the author on both the St. Lawrence and Niagara projects. See Daniel Macfarlane, *Negotiating a River: Canada, the U.S., and the Creation of the St. Lawrence Seaway* (Vancouver: UBC Press, 2014); "Creating a Cataract: The Transnational Manipulation of Niagara Falls to the 1950s," in *Urban Explorations: Environmental Histories of the Toronto Region*, ed. Colin Coates, Stephen Bocking, Ken Cruikshank, and Anders Sandberg (Hamilton, ON: L.R. Wilson Institute for Canadian Studies / McMaster University, 2013); and "A Completely Man-Made and Artificial Cataract: The Transnational Manipulation of Niagara Falls," *Environmental History* 18, no. 4 (2013): 759–84. The author is in the process of writing a book on the history of the Canadian-American engineering and hydroelectricity landscape of Niagara Falls.
- 2 Col. W.H. Potter (Office Chief of Engineers, U.S. Army), statement, June 27, 1950, file: St. Lawrence Seaway, Box 69, staff file: Records of John S. Bradgon, St. Lawrence Seaway – 1954, Dwight D. Eisenhower Presidential Library and Archives, Abilene, KS (hereafter, Eisenhower Archives); Special International Niagara Board, Preservation and Improvement of the Scenic Beauty of the Niagara Falls and Rapids, S. Doc. No. 128-71/2 (Washington, DC: Government Printing Office, 1931).
- 3 The Chicago diversion, which from the early twentieth century took water from Lake Michigan through the Chicago Sanitary and Ship Canal into the Mississippi River basin and eventually to the Gulf of Mexico, was a continual irritant in Canadian-American relations.
- 4 Franklin D. Roosevelt, memorandum to Secretary of State, December 23, 1935, 711.42157 SA 29/1375–½, Box 4048, RG59, Government of the United States, National Archives and Records Administration (NARA) II, College Park, MD.
- 5 On Canada's growing development of hydro power during World War II, see Matthew Evenden, *Allied Power: Mobilizing Hydro-Electricity during Canada's Second World War* (Toronto: University of Toronto Press, 2015).
- 6 Col. W.H. Potter statement, June 27, 1950, Eisenhower Archives.
- 7 The allowable diversion volume was split evenly between the two countries. As the United States was not able to utilize its full complement of the water, because it did not have enough hydroelectric generating facilities in place, Canada was allowed to use this extra water—until the United States was able to, which would prove to be later in the 1950s with the construction of the Moses plant. Proposed FPC Plan for Niagara Power Redevelopment, 1953, Eisenhower Archives.
- 8 For extended studies of the construction phase, see Macfarlane, *Negotiating a River*, as well as Robert W. Passfield, "The Construction of the St. Lawrence Seaway,"

- Canal History and Technology Proceedings* 22 (2003): 1–55; Claire Parham, *The St. Lawrence Seaway and Power Project: An Oral History of the Greatest Construction Show on Earth* (Syracuse, NY: Syracuse University Press, 2009); William H. Becker, *From the Atlantic to the Great Lakes: A History of the U.S. Army Corps of Engineers and the St. Lawrence Seaway* (Washington, DC: U.S. Army Corps of Engineers, 1984); and William R. Willoughby, *The St. Lawrence Waterway: A Study in Politics and Diplomacy* (Madison: University of Wisconsin Press, 1961). Passfield and Becker provide the best overview of the technical aspects, while Parham focuses on the social and cultural aspects.
- 9 The phrase, used in Parham's subtitle, is attributed to M.W. Oettershagen, deputy administrator of the Seaway Development Corporation in 1959. Parham, *St. Lawrence Seaway*, xxiii.
  - 10 On the American side, approximately eighteen thousand acres were flooded, requiring the clearance of around 1,100 people, 225 farms, five hundred cottages, and 12.5 miles of highway. No entire communities were relocated, in part because of dikes that protected Massena, though the waterfront area of Waddington was affected and the town of Louisville lost about a third of its taxable land, including Louisville Landing, a historic port on the St. Lawrence.
  - 11 While this razing was undoubtedly a pragmatic consideration, Tina Loo argues that a key aspect of modernity was a rejection of the past, symbolized by the removal of buildings and infrastructure in areas to be flooded as part of hydroelectric projects. The relocation of buildings and resettlement and consolidation of communities was also part of the Arrow Lakes project. Loo, "People in the Way: Modernity, Environment, and Society on the Arrow Lakes," *BC Studies*, no. 142–143 (Summer/Autumn 2004): 177–80.
  - 12 Reginald Hardy, "Many Fine Homes Soon to Disappear—St. Lawrence Families' Plight," *Ottawa Evening Citizen*, August 11, 1954, copy, SPP Series, HEPCO Archives, Toronto.
  - 13 IJC, Canadian Section, *Preservation and Enhancement of Niagara Falls: Report to the International Joint Commission by the International Falls Engineering Board* (Washington/Ottawa: IJC, 1953).
  - 14 IJC, Canadian Section, *Report to the Governments of the United States of America and Canada on Remedial Works Necessary to Preserve and Enhance the Scenic Beauty of the Niagara Falls and River* (Washington/Ottawa: IJC, 1953).
  - 15 Nuala Drescher, *Engineers for the Public Good: A History of the Buffalo District U.S. Army Corps of Engineers* (Washington, DC: U.S. Army Corps of Engineers, 1982), 258.
  - 16 "Niagara Falls Preservation Program Starts," press release, January 15, 1954, file 1268-D-40, vol. 6348, pt. 25.2, St. Lawrence General Correspondence (November 25, 1953–January 29, 1954), LAC.
  - 17 David E. Nye, *American Technological Sublime* (Cambridge, MA: MIT Press, 1994).
  - 18 James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*



- (New Haven: Yale University Press, 1998), 4.
- 19 Tina Loo with Meg Stanley, "An Environmental History of Progress: Damming the Peace and Columbia Rivers," *Canadian Historical Review* 92, no. 3 (2011): 399–427; Tina Loo, "High Modernism, Conflict, and the Nature of Change in Canada: A Look at *Seeing like a State*," *Canadian Historical Review* 97, no. 1 (2016): 34–54; James Murton, "Creating Order: The Liberals, the Landowners, and the Draining of Sumas Lake, British Columbia," *Environmental History* 13, no. 1 (2008): 96, 104; Matthew Farish and P. Whitney Lackenbauer, "High Modernism in the Arctic: Planning Frobisher Bay and Inuvik," *Journal of Historical Geography* 35, no. 3 (2009): 519.
  - 20 For a further elaboration of "negotiated high modernism," see Macfarlane, *Negotiating a River*, 228–29; and Daniel Macfarlane, "Negotiated High Modernism: Canada and the St. Lawrence Seaway and Power Project," in *Science, Technology, and the Modern in Canada: An Anthology in Honour of Richard Jarrell*, ed. Edward Jones-Imhotep and Tina Adcock (Vancouver: UBC Press, forthcoming).
  - 21 Ginger Strand, *Inventing Niagara: Beauty, Power, and Lies* (Toronto: Simon & Schuster, 2008), 197; Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill & Wang, 1995). See also Paul R. Josephson, *Industrialized Nature: Brute Force Technology and the Transformation of the Natural World* (Washington, DC: Island / Shearwater, 2002); David E. Nye, *American Technological Sublime* (Cambridge, MA: MIT Press, 1994); Erik Swyngedouw, "Modernity and Hybridity: Nature, *Regeneracionismo*, and the Production of the Spanish Waterscape, 1890–1930," *Annals of the Association of American Geographers* 29, no. 3 (1999): 443–65.
  - 22 Carolyn Johns, introduction to *Canadian Water Politics: Conflicts and Institutions*, ed. Mark Sproule-Jones, Carolyn Johns, and B. Timothy Heinmiller (Montreal: McGill-Queen's University Press, 2008), 4; Jean Manore, "Rivers as Text: From Pre-Modern to Post-Modern Understandings of Development, Technology and the Environment in Canada and Abroad," in *A History of Water*, vol. 1, *Water Control and River Biographies*, ed. Terje Tvedt and Eva Jakobsson (London: I.B. Tauris, 2006), 229.
  - 23 Donald Creighton, *The Commercial Empire of the St. Lawrence, 1750–1850* (Toronto: Ryerson Press, 1937), 6–7.
  - 24 W.L. Morton, "Clio in Canada: The Interpretation of Canadian History," *University of Toronto Quarterly* 15, no. 3 (1946): 227–34; W.L. Morton, *The Kingdom of Canada: A General History from Earliest Times* (Toronto: McClelland & Stewart, 1963); J.M.S. Careless, *Canada: A Story of Challenge* (Toronto: Macmillan of Canada, 1963).
  - 25 Janice Cavell, "The Second Frontier: The North in English-Canadian Historical Writing," *Canadian Historical Review* 83, no. 3 (2002): 4.
  - 26 For examples of literature from Quebec that identify with the St. Lawrence, see Jean-Claude Lasserre, *Le Saint-Laurent, grande*

- porte de l'Amérique (LaSalle, QC: Hurtubise, 1980); Jean Gagne, *À la découverte du Saint-Laurent* (Montreal: Éditions de l'Homme, 2005); Gilles Matte and Gilles Pellerin, *Carnets du St-Laurent* (Montreal: Heures Blues, 1999); Marie-Claude Ouellet, *Le Saint-Laurent-Fleuve à découvrir* (Montreal: Éditions de l'Homme, 1999); and Alain Franck, *Naviguer sur le fleuve au temps passé 1860–1960* (Quebec: Publications du Québec, 2000).
- 27 See A.A. den Otter, *The Philosophy of Railways: The Transcontinental Railway Idea in British North America* (Toronto: University of Toronto Press, 1997).
  - 28 Andrew Biro uses the term “hydrological nationalism,” but since St. Lawrence nationalism is tied up in both the waters of the St. Lawrence and the manipulation of these waters, it is both hydrological and hydraulic—the former is generally accepted as referring to the water itself and the latter to the ways it is manipulated and modified. Andrew Biro, “Half-Empty or Half-Full? Water Politics and the Canadian National Imaginary,” in *Eau Canada: The Future of Canada's Water*, ed. Karen Bakker (Vancouver: UBC Press, 2007), 323.
  - 29 Prominent examples include Josephson, *Industrialized Nature*; Nye, *American Technological Sublime*; and Leo Marx, *The Machine in the Garden: Technology and the Pastoral Idea in America* (New York: Oxford University Press, 1964).
  - 30 These links are discussed by prominent intellectuals such as Harold Innis, George Grant, Marshall McLuhan, and Ramsay Cook. See Marco Adria, *Technology and Nationalism* (Montreal: McGill-Queen's University Press, 2010); R. Douglas Francis, *The Technological Imperative in Canada: An Intellectual History* (Vancouver: UBC Press, 2009); Cole Harris, “The Myth of the Land in Canadian Nationalism,” in *Nationalism in Canada*, ed. Peter Russell (Toronto: McGraw-Hill, 1966); and Damien-Claude Bélanger, *Prejudice and Pride: Canadian Intellectuals Confront the United States, 1891–1945* (Toronto: University of Toronto Press, 2011).
  - 31 In Donald Worster's chapter on Canadian-American differences, he cites Marilyn Dubasak, Margaret Atwood, and Northrop Frye in support of this hostility argument. Worster, “Wild, Tame, and Free: Comparing Canadian and U.S. Views of Nature,” in *Parallel Destinies: Canadian-American Relations West of the Rockies*, ed. John M. Findlay and Kenneth S. Coates (Montreal: McGill-Queen's University Press, 2002).
  - 32 These include cultural differences (e.g., fusion between freedom/liberty and wilderness in American thinking), the greater Canadian reliance on resource extraction industries, a relatively greater abundance of wilderness, and the lack of federal control over land in Canada. Worster, “Wild, Tame, and Free,” 257–60. See also George Altmeyer, “Three Ideas of Nature in Canada, 1893–1914,” in *Consuming Canada: Readings in Environmental History*, ed. Chad Gaffield and Pam Gaffield (Toronto: Copp Clark, 1995).
  - 33 Adria, *Technology and Nationalism*, 45.

- 34 H.V. Nelles, *The Politics of Development: Forests, Mines, and Hydro-Electric Power in Ontario, 1849–1941*, 2nd ed. (Montreal: McGill-Queen's University Press, 2005), 216.
- 35 Francis, *Technological Imperative*, 2. This view of the impact of technology on North American integration was forwarded by philosopher George Grant; see his *Lament for a Nation: The Defeat of Canadian Nationalism* (Toronto: McClelland & Stewart, 1965) and *Technology and Empire: Perspectives on North American* (Toronto: House of Anansi, 1969).
- 36 Patrick McGreevy, *The Wall of Mirrors: Nationalism and Perceptions of the Border at Niagara Falls* (Orono: Canadian-American Centre, University of Maine, 1991), 1–3.