Canadian water law has evolved over an extended period of time as a complex mixture of federal and provincial legislation and case law with provincial arrangements influenced by both riparian and prior appropriation doctrine as well as by the civil law tradition of Quebec. The article reviews highlights from the long-term evolution of Canadian water law, policy and institutions following a chronological path from Confederation in 1867 to the present. Three key shifts that have more recently begun to appear in background assumptions of Canadian water law are then identified. In particular, it is noted (1) that general confidence in the abundance of water is giving way to concerns over security and occasional scarcity, (2) that the primacy of human water uses is gradually being moderated by acknowledgement of the importance of environmental flows, and (3) that international considerations may be relevant to a greater degree than previously contemplated. The concluding section of the paper presents emerging policy directions in relation to the legacy of historic water law and policy decisions and the shifting assumptions previously reviewed with emphasis on sustainability, conservation initiatives and watershed frameworks.

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INTRODUCTION

1. PART I FIFTEEN DECADES OF CANADIAN WATER LAW
   1.1. 1860s: Navigation and Fisheries in the Confederation Era
   1.2. 1870s: Powering Sawmills and Delivering Municipal Water Supply
   1.3. 1880s: Rivers and Streams reconfigure Confederation
   1.4. 1890s: Fisheries, Irrigation and Water Power
   1.5. 1900s: International Waters and Municipal Wastes
   1.6. 1910s: The Conservation of Water Resources and a Right to Pure Water
   1.7. 1920s: Water Power and Pollution
   1.8. 1930s: Managing Water Scarcity and Diversions
   1.9. 1940s: Industrial Water Pollution and Suburban Growth
   1.10. 1950s: Administrative Water Governance Mid-Century
   1.11. 1960s: Water Resources and the Export Debate
   1.13. 1980s: Making Water Policy
   1.14. 1990s: Water Traders
   1.15. 2000s: Drinking Water Safety
   1.16. Building on the Foundations

2. PART II BACKGROUND ASSUMPTIONS IN TRANSITION
   2.1. The Availability of Water
   2.2. Environmental Values of Water
   2.3. Acknowledging the International Context

3. PART III SECURING SAFE AND SUSTAINABLE ABUNDANCE
   3.1. Sustainability
   3.2. Water Valuation and Conservation Measures
   3.3. Watershed Management and Participation

CONCLUSION
INTRODUCTION

Amidst widespread contemporary agreement on the importance of water policy in Canada,¹ and a proliferation of reform proposals,² inadequate attention is devoted to the continuing influence of long-established legal and institutional arrangements that frame decision-making. This framework, the accumulated product of historic evolution and innovation, is firmly grounded in law, practice, assumptions and attitudes that continue to affect the implementation of new policy proposals. Or, as recently expressed elsewhere, “institutional arrangements for water develop and change over time, but earlier decisions and rules set limits on what can happen.”³ This paper elaborates and confirms that observation by recalling some of those earlier decisions and rules as the established context for contemporary water policy initiatives. Thus, prominent twenty-first century initiatives oriented towards environmental sustainability,


² Reform proposals that have been brought forward in several jurisdictions or produced under the auspices of the Conference Board of Canada, the Walter and Duncan Gordon Foundation, the NRTEE, and the Polis Project on Ecological Governance, among others are noted and discussed later in this essay; see infra notes 181, 210, 239, 253, 278.

conservation, and watershed management are profoundly influenced by a legal and institutional framework—and its supporting assumptions—established over many decades.

In keeping with the argument that historic arrangements remain influential, Part I surveys Canadian water law, policy and institutions following a chronological path from Confederation in 1867 to the present. This decade by decade approach reflects water law and policy as the cumulative result of past decisions whose significance and impact will not readily be overcome or eliminated by the next round of innovations. Selected examples underscore the ongoing significance of longstanding arrangements.

Part II identifies three key transitions in background assumptions. In particular, it is noted (1) that general confidence in abundance and water quality now occasionally gives way to concerns over scarcity, public health, and even security; (2) that the predominant focus on human water uses is being moderated by acknowledgement of the importance of environmental considerations; and (3) that international considerations may be more relevant than previously contemplated.

Part III describes three emerging policy directions—sustainability, water valuation and conservation, and watershed management—with reference to the legacy of historic water law and policy decisions and the shifting assumptions previously reviewed.

1. PART I FIFTEEN DECADES OF CANADIAN WATER LAW

Legal frameworks governing water allocation and quality predate Canadian Confederation: riparian principles associated with the ownership of shoreline property were applicable through the common law in Ontario and the Atlantic provinces, civil law principles with antecedents in Roman law operated in Quebec, and elements of a licensing scheme along the lines of the American prior appropriation—or first in time, first in right model—had already been introduced in British Columbia. This part of the paper notes highlights in the evolution of these systems, including the implementation of federal and provincial legislative frameworks.

1.1. 1860s: Navigation and Fisheries in the Confederation Era

The nineteenth century rafts and timber slides of the Ottawa River valley and other forest regions of central and eastern Canada are frequently understood to symbolize the vital significance of inland navigation to the economy. Fisheries, already extensively regulated within individual colonies prior to the British North America Act, became the subject of important

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federal legislation very shortly after Confederation. The *Fisheries Act* of 1868 addressed both industry regulation and resource protection, with the latter promoted through, for example, prohibitions on “prejudicial or deleterious substances” that could result in injuries to fishing grounds or pollution.8

Navigation and fisheries found their places among enumerated federal powers in constitutional arrangements and have been a persistent source of conflict in the legal order.9 To be reminded of the enduring legal, cultural, and economic significance of traditional water uses, it is only necessary to mention recent changes to navigable waters legislation or controversial amendments to the *Fisheries Act*.10

1.2. 1870s: Powering Sawmills and Delivering Municipal Water Supply

Nineteenth century waterways provided crucial mechanical power for industrial activity concentrated along their shores. Water power sites, (though not yet utilized for hydro-electric power production) generated legal controversy, with access to water flow regulated on the basis of riparian rights, an array of contractual arrangements, and legislative intervention.11

Certain forms of water pollution also attracted official attention. Sawdust and associated debris from lumber mills were particularly problematic in light of three adverse impacts: this material impeded navigation, interfered with fish and fish habitat, and its decomposition presented risks to public health and safety.12 So, even before environmental considerations such as biological oxygen demand levels, for example, were well understood, legislative efforts were made to maintain water quality. In 1873, Parliament prohibited the discharge of lumber mill waste, including sawdust, into navigable waterways. To the extent that exemptions were preserved to allow waste discharges for the benefit of industry, applicants were required to demonstrate that “the public interest would not be unjustly affected.”13

Simultaneously, the 1870s witnessed the transformation of provincial legislative frameworks for municipal water supply and finance, as local governments acquired private water companies. Toronto, for example, assumed control of a water system previously developed by a pioneering private investor with public commissioners assuming responsibility for supplying

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8 *An Act for the Regulation of Fishing and Protection of Fisheries*, SC 1868, c 60, s 14.
10 See e.g. provisions respecting “serious harm to fish” as introduced by the *Jobs, Growth and Long-term Prosperity Act*, SC 2012 c 19, s 135. *Fisheries Act*, RSC 1985, c F-14; *Navigation Protection Act*, RSC 1985, c N-22.
11 See *Miner v Gilmour*, [1858] 14 ER 861, 7 WR 328 (JCPC).
“an abundant supply of pure and wholesome water.” Communities elsewhere undertook the civic challenge of delivering water through a network of pipes that replaced urban wells and various forms of privately sponsored water systems with public infrastructure.

The expanded role of municipalities in water supply engaged competing conceptions of water as an economic or public good, with divergent perceptions a source of contention even today. And although private wells disappeared from the urban landscape, groundwater and applicable legal principles remain central to the overall policy agenda as awareness has increased of the inter-relationship of surface and groundwater systems.

1.3. 1880s: RIVERS AND STREAMS RECONFIGURE CONFEDERATION

During the late nineteenth century, Confederation arrangements were reconfigured by controversies over, for example, such things as liquor licenses and insurance regulation. Perhaps not as iconic, the legal controversies over water and its role in shaping and eroding the constitutional structure should not be overlooked.

Prime Minister John A. Macdonald had a both political and legal conflict with Ontario Premier Oliver Mowat over provincial legislation concerning access to valuable river facilities that had been strategically installed to assist the timber drive. From the perspective of water management, even though the legal dispute between rival lumbermen Caldwell and McLaren reflected a significant conflict between private rights and public interests in waterways, the limited scope of those public interests is striking. In part because the lumber industry contributed substantially to government revenues, officials customarily equated the well-being of the industry with the public interest.

Given the economic contributions of the lumber trade, little consideration was given to the environmental implications of forest industry practices, including impacts on waterways. Yet forest operations had serious environmental effects, including altered runoff patterns and in-stream flows. So-called river “improvements” that altered channels to accommodate timber

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15 See Michèle Dagenais, Montréal et l’eau : une histoire environnementale (Montréal: Boréal, 2011) at 68–78.

16 See e.g. “No such thing as free water”, The Globe and Mail (21 July 2009).


drives accelerated the scouring of riverbeds and shorelines. When bark, sunken logs, and discarded slabs decomposed, like other organic wastes from industrial sources these materials placed heavy demands on the oxygen supplies of inland waterways.\textsuperscript{20}

In the same era, judicial decisions concerning fishing rights along non-navigable waterways (especially in maritime Canada) undermined federal licensing arrangements despite apparently explicit foundations in the constitution.\textsuperscript{21} Eastern provinces found themselves called upon to establish or to re-introduce administrative regimes alongside the federal fisheries program.\textsuperscript{22} The federal government, however, consolidated its authority over navigation and shipping both in the courts and by means of the \textit{Navigable Waters Protection Act [NWPA]}, a statute whose constitutional ambit has been repeatedly tested and explored.\textsuperscript{23} Conflicts arose frequently between provincial hydro-electric power development and the federal navigation power while more recently the scope of federal environmental assessment authority triggered by decisions about navigation has been contested.

1.4. 1890s: Fisheries, Irrigation and Water Power

Persistent uncertainty concerning regulatory control of fisheries during the 1890s was addressed through an elaborate reference to the judiciary for an opinion.\textsuperscript{24} The outcome, confoundingly imprecise in operational terms, was widely understood to have further extended provincial authority. Thus, the \textit{Globe} pronounced: “The Dominion gets decidedly the worst of it.” Ottawa could “protect, preserve and propagate fish,” while the Provinces enjoyed “the sole right to catch the fish so preserved and protected.” The durability of this configuration was doubtful, “for the Dominion government can hardly be expected to expend considerable sums in maintaining hatcheries to put fish into the great lakes that become the property of the Province of Ontario whenever they enter the water.”\textsuperscript{25}

When the case moved to the Judicial Committee on appeal, that body simultaneously affirmed provincial proprietary rights in the fisheries while upholding federal legislative jurisdiction.\textsuperscript{26} The federal and provincial governments, exceptionally, agreed to the administrative reorganization necessitated by this outcome. Federal regulatory authority over


\textsuperscript{21} Following a series of prosecutorial decisions in lower courts, the constitutional question was resolved in \textit{R v Robertson}, [1882] 6 SCR 52, 1882 CanLII 25 (SCC).

\textsuperscript{22} See “The Question of Riparian Rights”, \textit{The Globe} (2 May 1882).


\textsuperscript{24} See \textit{Re Provincial Fisheries}, [1896] 26 SCR 444, 1896 CanLII 76 (SCC).

\textsuperscript{25} “The Fisheries Judgment”, \textit{The Globe} (15 October 1896); see Moses, supra note 9 for recent developments.

\textsuperscript{26} See \textit{Ontario (AG), Quebec (AG) and Nova Scotia (AG) v Dominion of Canada (AG)}, [1898] UKPC 31 (BAILII).
the manner of fishing (including times and seasons), remained intact while the provinces assumed control of leasing.27

In the 1890s, with tariffs, railway building, and immigration as pillars of the National Policy, competition for access to prairie water supplies and the importation of new legal principles curtailing riparian rights, culminated in the *North West Irrigation Act*, an unacknowledged cornerstone of western settlement and expansion.28 By asserting Crown ownership of water, this legislation established the foundations for water licensing, and, accordingly, placed western Canadian water law on a different footing than in the original federating provinces where a common law riparian regime and its civil law counterpart held sway.29

In eastern Canada, efforts to employ emerging technology to secure hydro-electric power from Niagara Falls and other locations accelerated through the 1890s. Through recognition of state ownership and supervision of water power developments, Niagara foreshadowed a flurry of new water power leases. Privately produced power, often under the direction of American interests, initially remained the norm until Ontario’s Hydro Electric Power Corporation took shape in the early 1900s.30

Hydro power developments profoundly altered the ecological processes of major waterways through damming, flooding, scouring and diversion, often triggering new conflicts with other river users such as the lumber industry and railway interests.31 Notably, improved technological capacity to transmit hydro-electric power allowed twentieth-century Canadians to live at growing distances from river-based power sites, even as they became more dependent upon those water powers for comfort and convenience. Succeeding generations have extended the hydro-electricity production system and, amidst mounting concern over greenhouse gas emissions, now seek greater efficiencies from many early hydro installations or greenfield sites.32

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27 See “Canada’s Fisheries”, *The Globe* (23 June 1898).


31 See e.g. letter from Angus MacMurchy, Canadian Pacific Railway Company, to W.E. Raney, Attorney General (29 September 1920) in Public Attorney’s Office, Attorney General’s Papers, RG 4-32, 1921, File 1712.

1.5. 1900s: International Waters and Municipal Wastes

At the turn of the 20th century, several transboundary water issues figured prominently alongside federal-provincial controversies on the public agenda. When the city of Chicago reversed the flow of the Chicago River away from Lake Michigan in 1900, it initiated the diversion of waters out of the Great Lakes basin and precipitated a stream of inter-jurisdictional controversies. The Chicago diversion, in conjunction with irritants elsewhere in the Great Lakes system and disputes over use of other shared waters, stimulated interest in broader solutions. For example, when international negotiations culminated in the *Boundary Waters Treaty* of 1909 and creation of the International Joint Commission (IJC), the Milk and St. Mary River system that worked its way back and forth across the 49th parallel between Montana and Alberta, was “to be treated as one stream for the purposes of irrigation and power.”

Meanwhile, municipal sewage systems and sewerage installations proliferated. Designed to remove organic human wastes, these subterranean conduits also facilitated the waterborne removal of industrial effluent and chemicals from manufacturing establishments with largely unintended consequences in the form of contamination and potential for epidemic disease. These impacts prompted severe, yet rarely enforced, legislative intervention, such as an 1897 prohibition against the discharge of “manure or other refuse, or vegetable or animal matter, or other” into Ontario waters.

While prominent waterworks engineers asserted that the diluting effect of the Great Lakes was such that “there is no chance of infection being carried from one of the great cities to another,” American President Theodore Roosevelt echoed progressive era contemporaries by insisting that “civilized people should be able to dispose of sewage in a better way than by putting it into drinking water.” Shortly thereafter, an IJC investigation refuted engineering complacency while new developments in drinking water protection permitted many communities to circumvent Roosevelt’s challenge. Specifically, it was realized that public

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health could now be protected by means of water treatment through chlorination, a subject of experimentation from the 1890s and then successfully introduced to North America in 1908 at Jersey City. Two years later, Toronto began chlorination of the municipal supply. The mechanical or chemical protection of drinking water thereafter accommodated contamination of surface waters into which sewage would continue to flow for many decades with treatment efforts regularly falling short. National sewage treatment standards remained under development in Canada even after the turn of the twenty-first century, with astronomical infrastructure costs associated with renewing existing systems across Canada.

1.6. 1910s: The Conservation of Water Resources and a Right to Pure Water

Under the leadership of Clifford Sifton, the Commission of Conservation addressed water issues of the Great War era alongside forests, mines, and agricultural resources. Inquiries were launched to assess Canada’s hydro-electric power production potential and to ascertain how many communities had installed municipal water supply and sewerage systems. The limitations of local action and the inter-jurisdictional dimensions of water quality and supply were closely examined: according to one participating engineer, “Ontario may have the most stringent laws relative to water pollution, and after putting its house in order would be yet dependent upon the action taken by … Quebec relative to the pollution of the Ottawa River whose banks are interprovincial.”

Conservationists of the era invoked a business-like principle also characteristic of American progressivism: “We are prosperous now, but we must not forget that it is just as important that our descendants should be prosperous in their turn.” Accordingly, the analysis continued, “each generation is entitled to the interest on the natural capital, but the principal should be handed on unimpaired.” Although this insight is hardly a direct precursor of sustainable development per se, elements of conceptual overlap such as intergenerational equity are evident. Other twenty-first century challenges such as a human right to water were also under consideration.

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41 See Benidickson, Culture of Flushing, supra note 12 at 229.


46 See Denis, supra note 36.


In the midst of perilous typhoid outbreaks, Senator Napoleon Belcourt championed legislation that aimed to safeguard vulnerable populations from sewage contamination. In so doing—ultimately without success—Belcourt (well in advance of the 1948 Universal Declaration on Human Rights and derivative pronouncements), asserted a powerful claim that remains to be realized: “the individual and the public as well, have an inalienable and indefeasible right to pure water.”49 Determined efforts to ensure access to clean water continue today including in the United Nation’s Sustainable Development Goals,50 and in proposals for a human right to water.51

Though not elevated to the level of a right, international consideration of water quality and public health occupied the IJC in its first boundary waters pollution reference, launched in 1912. The IJC reported that “[t]he communities along their banks which have sewerage systems all discharge raw sewage into the streams.”52 By implication, then, neither country regarded the international context as a source of limitation on (waste) water management.

Other notable developments in this period included the formal introduction of irrigation districts in southern Alberta,53 and Nova Scotia’s Water Act of 1919 designed to bring private riparian rights in the province under public authority.54

**1.7. 1920s: WATER POWER AND POLLUTION**

Private companies and public agencies such as Ontario’s HEPC vigorously pursued major water power projects across Canada during the 1920s.55 However, the potential impacts of new power generation facilities on navigation accentuated federal-provincial wrangling with proposed developments involving the St. Lawrence, the Ottawa River and the Lake of the Woods-Winnipeg River system among the early controversies.56 Federal officials sought to establish that legislative impacts on hydro-power were merely incidental in constitutional terms to federal authority over navigation while their provincial counterparts endeavored to secure recognition as owners of the water resource in order to insulate themselves against suggested federal interference.57

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56 See Armstrong, supra note 23 at 160–165.

57 Ibid at 167.
In a judicial reference to Canada’s Supreme Court, the ruling was non-committal and offered very little illumination in the form of a legal “it depends”: “The extent to which the provincial legislatures may be restricted in, or excluded from, the control of provincial property by the enactment of Dominion laws operative under section 91 cannot be defined in the abstract.”

At the municipal level, the use of chlorination to treat water supply expanded during the 1920s. With this proverbial “magic bullet” more generally available, public health officials disengaged from a half-century struggle on the environmental front to protect sources of water supply; it seemed much less necessary to worry about wastewater discharges to natural waterways when chemicals added at a treatment facility promised more affordable security. Public health concerns were therefore decoupled from the issue of ambient water quality, a policy assumption that remained largely unquestioned until the Walkerton drinking water tragedy of May 2000 resulted in seven deaths and widespread illness, thus highlighting the virtues of a multi-barrier approach involving source-to-tap protection of drinking water as discussed below.

The judiciary, for its part, offered mixed signals regarding the role of law in protecting water sources. Justice Rinfret wrote in *Groat v City of Edmonton* that “pollution is always unlawful and, in itself, constitutes a nuisance.” Simultaneously, however, the court acknowledged the undeniable necessity of sewers and drains, even confirming that their environmental impacts might actually enjoy legal authorization where “the statute expressly so states.” Sewers have continued to figure prominently in the Supreme Court’s subsequent efforts to elaborate a general doctrine of statutory authorization.

1.8. 1930s: Managing Water Scarcity and Diversions

Drought produced desperate economic conditions for many engaged in western Canadian agriculture, prompting heightened official attention to water shortages. One prominent legislative response, the *Prairie Farm Rehabilitation Act*, specifically sought “the best methods … to secure the rehabilitation of the drought and soil drifting areas in … Manitoba, Saskatchewan and Alberta, and to develop … within those areas systems of farm practice, tree culture, water supply, land utilization and land settlement that will afford greater economic security.” This intermingling of water and security agendas with land-use and settlement represents a comparatively early version of integrated resource planning.

The prairie response to drought also encompassed new programs to enhance water storage or to regularize flows. Moreover, when the Natural Resources Transfer arrangements

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62 *Ibid* at 532–533; see also *Fieldhouse v Toronto* (1918), 44 DLR 392, 43 OLR 491.
63 See *Tock v St. John’s (City of) Metropolitan Area Board*, [1989] 2 SCR 1181, 64 DLR (4th) 620.
64 *Prairie Farm Rehabilitation Act*, SC 1935, c 23, s 4.
of 1930 assigned more direct responsibilities to western provinces for lands and resources, local legislators became directly involved in water management and allocation. Building on some of the foundations of the earlier North West Irrigation Act, Alberta and Saskatchewan assumed legislative responsibility for establishing a water law framework adapted to provincial circumstances.

For its part, the federal Bureau of Mines embarked on a survey of “industrial waters” in 1934. The description reflected understanding that “some waters are much better adapted for certain industries than others.” Previous disregard of industrial water quality concerns was widely attributed to the understanding that “water is an abundant and cheap commodity and its impurities, in most cases, are not easily detected except by chemical analysis.” The study sought to identify a wide range of impurities capable of interfering with the quality of manufactured products in major economic sectors such as paper, sugar, textiles and leather goods. Purification and treatment techniques extending from chlorination through aeration and water softening were increasingly sophisticated and widespread. Many had positive intentions about expanding wastewater treatment through the adoption of generally available techniques such as activated sludge. But in the face of financial constraints during the Great Depression, these were often abandoned or deferred.

Ontario’s energy requirements in the 1930s drew attention to opportunities for power generation along northern rivers, several of which also appeared to be prime candidates for diversion. Viewed through the provincial lens, power generation and river diversion were internal matters. Yet because of their implications for flows and levels within the Great Lakes, certain possible diversions were inevitably intertwined with the management of boundary waters and existing international power-sharing arrangements.

The broader prospects for economic development along the St. Lawrence presented the overall setting for international negotiations, federal-provincial friction and inter-provincial acrimony. As negotiations between Canada and the United States over development of the St. Lawrence foundered in the depression era, Ontario independently pursued diversions of the Kenogami (1939) and Ogoki (1943) rivers in a quest for electricity, access to timber

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66 *Water Rights Act, SS 1931, c 17; Water Resources Act, SA 1931, c 71.*
69 *Ibid* at 11–21.
72 See Correspondence and Documents Relating to St. Lawrence Deep Waterway Treaty 1932, Niagara Convention 1929, and Ogoki River and Kenogami River (Long Lake) Projects and Export of Electrical Power (Ottawa: JO Patenaude ISO, Printer to the King’s Most Excellent Majesty, 1938) at Part II [*Correspondence St. Lawrence*].
resources, and resulting provincial revenues.\textsuperscript{73} On the basis of an exchange of notes in October and November of 1940 and as re-affirmed in the 1950 \textit{Niagara River Water Diversion Treaty}, waters diverted into the Great Lakes through the Long Lac-Ogoki works were not subject to equal sharing for power production between the United States and Canada.\textsuperscript{74} Substantially larger diversions were subsequently implemented elsewhere.\textsuperscript{75}

The potential for controversy over international hydro-electricity exports had been recognized early in the century but became more clearly apparent during the Great Depression.\textsuperscript{76} Thus, in 1937, when Montreal Light, Heat and Power offered surplus electricity to the Aluminum Company of America, Quebec readily approved the sale subject to conditions regarding allocation of the proceeds and employment opportunities in construction. But when federal approval of the export proposal was not immediately forthcoming, company officials sought authority for “disposing, temporarily, of some surplus power and bringing into the Dominion of Canada a substantial amount of money which would otherwise be lost.”\textsuperscript{77} Safeguards in the form of one-year license terms failed to alleviate the national concerns arising from the thought that any attempt to reclaim power exports for domestic needs would produce “international complications.”\textsuperscript{78} Subsequent proposals to export power from Ontario encountered similar objections which, decades later, were echoed in the water export debates of the 1960s.\textsuperscript{79}

The twentieth century hydro-electricity boom entailed adverse consequences for waterways, and in many instances for indigenous communities. Aboriginal settlements were displaced; harvesting grounds and hunting territories were inundated and destroyed, with much of this activity concentrated in the 1930s when Ontario’s HEPC took advantage of improved transmission technology to expand aggressively into the northeastern region of the province.\textsuperscript{80}

\begin{itemize}
\item \textsuperscript{73} JC Day & Frank Quinn, \textit{Water Diversion and Export: Learning from the Canadian Experience} (Waterloo: University of Waterloo, 1992) at 75–83.
\item \textsuperscript{74} Treaty Between Canada and the United States of America Concerning the Diversion of the Niagara River, 10 October 1950, CTS 1950 No 3 art 3.
\item \textsuperscript{75} Frédéric Lasserre, “Drawers of Water: Water Diversions in Canada and Beyond” in Karen Bakker, ed, \textit{Eau Canada} (Vancouver: UBC Press, 2007) 143 at 143, 151; see also Day & Quinn, supra note 73.
\item \textsuperscript{76} See Correspondence St. Lawrence, supra note 72, Part III; see generally AE Grauer, “The Export of Electricity from Canada” in RM Clark, ed, \textit{Canadian Issues: Essays in Honour of Henry F. Angus} (Toronto: University of Toronto Press, 1961).
\item \textsuperscript{77} Letter from JS Norris, President of Montreal Light, Heat & Power Consolidated, to WL MacKenzie King, Prime Minister of Canada (10 August 1937) in Correspondence St. Lawrence, supra note 72 at 63–64.
\item \textsuperscript{78} Memorandum from TH Hogg, Chairman, Hydro-Electric Power Commission of Ontario, to MF Hepburn, Premier of Ontario (20 November 1937) in Correspondence St. Lawrence, supra note 72 at 67–71.
\item \textsuperscript{79} See infra note 112.
\item \textsuperscript{80} See Jean L Manore, \textit{Cross-Currents: Hydroelectricity and the Engineering of Northern Ontario} (Waterloo, Ont: Wilfrid Laurier University Press, 1999) at 95–110; for comparable developments later in western Canada, see James B Waldram, \textit{As Long as the Rivers Run: Hydroelectric Development and Native Communities in Western Canada} (Winnipeg: University of Manitoba Press, 1988).
\end{itemize}
1.9. 1940s: Industrial Water Pollution and Suburban Growth

Public officials anticipated a massive post-war reconstruction effort—including water-related infrastructure—following the disruptive impact of World War II on resource allocation and investment. On a grand scale, this entailed potential enhancement of the St. Lawrence for navigation and power,81 with local activities across the country to facilitate urban expansion.82 After pioneering experiments, notably along the Grand River, a broader initiative was directed towards watershed-based conservation authorities with a range of responsibilities.83 Additionally, post-war automobile traffic enhanced awareness of the recreational potential of Canada’s lakes, rivers and streams.84

Yet that recreational potential was threatened by industrial activity, including—ominously—the burgeoning pulp and paper sector.85 Fishing interests and camp owners along the Spanish River above its entry to Lake Huron protested the impact of a paper mill that re-opened in 1946 upstream from their operations. The manufacturing process rendered Spanish River waters unfit for swimming; fish were killed or driven elsewhere; and wild-rice beds were destroyed.86 Despite strong judicial sympathy for the riparian victims of industrial effluent, the government of Ontario ultimately intervened to facilitate the continued operation of the mill.87 Decades later, the overall sector remained a regulatory challenge for federal and provincial authorities.

Federal-provincial financing enabled suburban expansion during the 1950s. Generations of rhetoric affirming the responsibility of local governments for water and sewerage services were overlooked in the face of formidable capital costs, and inter-governmental financial transfer programs were then implicated in the massive expansion of water and sewage infrastructure across Canada.88 Post-war appliances—dishwashers and clothes washing machines, for

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82 For a discussion of investment in housing and social capital, including water supply, to facilitate urbanization, see Canada, *Royal Commission on Canada’s Economic Prospects: Final Report* (Ottawa: Queen’s Printer, 1957), ch 15.
example—utilized that infrastructure and furthered the transfer to the environment of domestic residuals, including phosphate-based detergents. These costs had not been anticipated.89

Consumption of phosphorus-based detergents grew rapidly following their introduction in the late 1940s. Passing through most treatment facilities and flowing without impediment through the sewerage conduits of any community still lacking a treatment plant, phosphorus wastes stimulated excessive algal growth. They thus undermined the quality of the aquatic environment, particularly in vulnerable waters such as shallow Lake Erie where daily loads—principally from municipal discharges—reached 137,000 pounds per day.90

The condition of Lake Erie and other boundary waters prompted Canada and the United States to seek IJC advice in 1946 and again in 1948, leading to a comprehensive report on boundary waters pollution in 1950. The document, including recommended “Objectives for Boundary Waters Quality Control,” contributed only modestly, however, to immediate reforms.91 A valiant effort by Toronto MP Rodney Adamson to protect navigable waters in the aftermath of devastating oil pollution of Lake Ontario during the summer of 1949 was no more successful than Napoleon Belcourt’s earlier foray into water quality. Fellow parliamentarians criticized this otherwise commendable idea for its poor execution, although a few were sufficiently candid to acknowledge the concern that lakeshore communities would no longer be able to dump sewage if the legislation were to be enacted.92 To this day, the problem of excess nutrients persists.93

1.10. 1950s: Administrative Water Governance Mid-Century

Provincial agencies with responsibility for pollution control were generally in place across the country by the 1950s, with a number of their forebears pre-dating this era. Such bodies were customarily constituted in conjunction with health departments, although organizations specifically dedicated to water quality or management were beginning to appear. Notable examples included British Columbia’s Pollution Control Board and the Ontario Water Resources Commission.94 Recognizing that “pollution of the water of rivers and lakes is a serious danger to public health,” Quebec’s Legislative Assembly established a committee to investigate the problem in 1955.95

92 See “Anti-Pollution Bill Defeated in Commons”, The Globe and Mail (7 October 1949).
94 See JR Menzies, “Water Pollution in Canada by Drainage Basins” in Resources for Tomorrow: Conference Background Papers, vol 1 (Ottawa: Queen’s Printer, 1961) 358; Pollution of Waters (Prevention) Act, RSS 1965, c 352; Public Health Act, RSA 1955, c 255; Pollution Control Act, SBC 1956, c 36; Pollution of Waters Prevention Act, RSM 1954, c 201.
Saskatchewan Premier and public health care pioneer T.C. Douglas urged Prime Minister St. Laurent to take preventive action against water pollution in the aftermath of a prolonged pollution incident affecting his province.96 “Had the Criminal Code made adequate provisions for the prevention of the pollution of streams by the careless disposal of waste chemicals it is entirely unlikely that the present pollution of the North Saskatchewan River would have occurred.”97 Alternatively, Douglas observed, had there been “an agency … with authority to prevent any industrial plant from putting any effluent into a river, it is again unlikely that this pollution would have … continued over such a period of time.”98 Despite these entreaties, a federal preference for infrastructure spending,99 and an enduring federal disinclination to address the matter comprehensively, have left the provinces largely responsible for safeguarding water quality.100

Government officials must be accorded considerable credit for pursuing mid-century water protection initiatives, though it is also important to note that forerunners of Canada’s environmental public interest groups were already active in the 1950s. The Conservation Council of Ontario, for example, intervened in the 1955 election to exhort candidates to address water pollution as “a concern of extreme urgency.”101 However, the cautionary interventions of pioneering public interest organizations were of limited effect alongside accelerating expenditure on major water-related infrastructure whether under private auspices such as Alcan’s diversion of the Netchako River in British Columbia, or in connection with public works such as the St. Lawrence Seaway,102 or water and sewerage development to meet the needs of an expanding population.103 A new source of massive water demand—nuclear power—was also now under development. It promptly resulted in disaster, namely, the December 1952 accident at Chalk River, Ontario. There, contaminated water was pumped from the damaged experimental nuclear reactor for disposal in nearby trenches.104

96  Letter from TC Douglas, Saskatchewan Premier, to LS St Laurent, Prime Minister of Canada (27 April 1954), Ad Hoc Interdepartmental Committee on Water Pollution in the Prairie Provinces, Library and Archives Canada (RG12, vol 2986, file 8352-9, Part 1).
97  Ibid.
98  Ibid.
100  See Kathryn Harrison, Passing the Buck: Federalism and Canadian Environmental Policy (Vancouver: UBC Press, 1996) at 4.
101  Letter from FH Kortright, President of the Conservation Council of Ontario, to “Mr. Candidate” (27 May 1955) in Ontario Archives, Pollution Control Board Minutes, 1951–55, RG84-12-0-146 RC Box E 196.
1.11. 1960s: Water Resources and the Export Debate

Environmental awareness and citizen efforts to stimulate laggard governments into action are frequently associated with the 1962 publication of Rachel Carson’s *Silent Spring*, whose Canadian content included an account of DDT poisoning of Mirimachi River salmon in the previous decade.105 Popular interest associated with the book may well have heartened government officials who were already labouring on the environmental file. In this regard, remarks of the Hon. Walter Dinsdale, Minister of Northern Affairs and National Resources in the Conservative government of John Diefenbaker, are noteworthy.

In 1961 Dinsdale greeted delegates to the Federal-Provincial Resources for Tomorrow Conference with the observation that they had convened “to seriously discuss the wise management of renewable resources; not with a view to immediate personal gain, but rather in the interest of generations yet unborn.”106 Dinsdale subjected resources management, water including, to scrutiny from the perspective that would later be named inter-generational equity.107 He also welcomed the public discussion stimulated by the conference as “an encouraging development in the Canadian body politic” on the grounds that “conservation is a moral issue.”108 More or less simultaneously, however, when the Columbia River Treaty was signed and ratified to control flood damage and produce hydropower in the United States on the basis of storage reservoirs in Canada,109 the agreement failed to respect fishing and other environmental considerations, including aboriginal concerns, with the result that these matters return intermittently to the negotiating agenda.110

Proposals to divert water flows on a continental scale were actively promoted during the 1960s in such forms as NAWAPA (North American Water and Power Alliance) and the GRAND Canal (Great Recycling and Northern Development) scheme.111 Utah Senator

Frank Moss celebrated the NAWAPA proposal as “a continent-wide plan for the collection, redistribution, and efficient utilization of waters now running off to the seas totally unused or only partially used.” For its part, the GRAND Canal plan called for the conversion of James Bay into a freshwater lake to supply water that would be pumped and channeled southward to reach Lake Huron via the French River. In addition to regulating Great Lakes water levels, this scheme was promoted as allowing for increased water withdrawals by Canada and the United States. Water transfer to the United States would be facilitated by the existing Chicago Diversion or other possible canal arrangements.

There was some political sympathy at the time for these remarkable engineering proposals which are intermittently revived as “zombie water projects.” Indeed, the then-Minister of Northern Affairs and National Resources argued in 1964 that “we in Canada, as I say, are especially fortunate in our water resources; our job now is to redirect these resources before they reach the ocean.” While the Leader of the Opposition agreed that, “these rivers that flow into the Hudson Bay ... will have to be reversed and their waters brought into those portions of our country which need them.”

Critical response to diversion proposals was soon evident. General A.G.L. McNaughton denounced NAWAPA as “a monstrous concept, a diabolic thesis.” McNaughton presented an important corollary to the model of resource use that portrayed an abundant water supply as the eternal blessing of providence: “It is our responsibility to use these resources with discretion, and to treasure the more basic of them for the generations of Canadian citizens who will come after us is a paramount responsibility.”

The critical voice of a youthful John N. Turner emerged in the same era. Turner, then Parliamentary Secretary to the Minister of Northern Affairs and National Resources, addressed a Washington audience on his assigned topic, “North American water resources development.” Cautioning that the concept of North American water was deceptive, he observed that it “sounds suspiciously like the suggestion that the waters of North America should be considered as a ‘continental water supply.’” Canadians, he insisted, say “there is

114 Ibid.
116 House of Commons Debates, 26th Parl, 2nd Sess, Vol 3 (5 May 1964) at 2932 (Hon Arthur Laing).
117 Ibid at 2937.
118 AGL McNaughton, “A Monstrous Concept, a Diabolic Thesis” in Dolman, supra note 112 at 16.
119 Ibid at 16.
121 Ibid at 1.
Canadian water, and there is American water ... but we do not like the new vocabulary which calls our water 'continental water'."

Turner then directly confronted the conventional rationale for water diversion associated with shortages in the American West and Southwest.

Given extraordinary quantities of water utilized for irrigation in the American Southwest, Turner questioned the demand side by asking whether there was “a shortage of water - or an excess of consumptive use.” Leaving the demand-side question for his American audience to resolve, he speculated that “much irrigation water is ineffectively used,” and urged careful consideration of the advantages of greater efficiency in irrigation use “in releasing water for household, commercial, or industrial purposes.” It took some time, however, for the importance of managing water demand through efficiencies to gain more widespread recognition.

A few years after the NAWAPA controversy, Canada’s Science Council did little to discourage the possibility of alleviating limitations in American water supply by means of transfers when it stated that Canada “may contain one third” of the world supply of fresh surface water. The council highlighted the “lavish” per capita supply, and pointed to conditions of “superabundance in many parts” of the country. On the other hand, the Science Council more appropriately underlined the need for research—“detailed estimates on future supply and demand”—as one foundation for decision-making about the export of fresh water from Canada.

Against the dramatic backdrop of the Canada-US water export debate, internal Canadian negotiations secured agreement on inter-provincial entitlements across the prairie provinces. The 1969 Master Agreement on Apportionment governing the allocation of flows between Alberta and Saskatchewan and between Saskatchewan and Manitoba elaborated and confirmed arrangements: two decades earlier the Prairie Provinces Water Board had been established with federal participation as a successor to an organization consisting exclusively of provincial government representatives with a mandate largely restricted to record-keeping. Later described as “the most significant interjurisdictional water management arrangement in Canada,” the 1969 Master Agreement and the Prairie Provinces Water Board, like many of the initiatives reviewed here, plays a continuing role.

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122 Ibid.
123 Ibid at 3.
124 See Part III below.
126 Ibid at 6.

As the 1960s ended, the Canada Water Act (CWA) was under development.\textsuperscript{129} This controversial legislation asserted significant federal authority over water quality and management, but never met the aspirations of its proponents. Its influence, for example, on the continuing challenge of broadening the perspective of decision-makers to the basin or watershed level remained limited. CWA funding arguably facilitated a transition toward new objectives, including sustaining the functions of freshwater environments.\textsuperscript{130} Nevertheless, federal financing flowed disproportionately to conventional water power and infrastructure projects, encouraging the unsympathetic observation that “an inclement institutional environment” tended to curtail promising and innovative measures.\textsuperscript{131}

The CWA also addressed “any aspect of water resource management that relates to restoring, maintaining or improving the quality of water” in parts of the country where water quality management had become (in constitutional terms) “a matter of urgent national concern.”\textsuperscript{132} The federal government, in conjunction with a province or provinces—or on a unilateral basis in the case of interjurisdictional waters where reasonable efforts had failed to secure agreement—might create agencies with specific responsibility to plan for the restoration, preservation, and enhancement of environmental water quality.\textsuperscript{133} Recommendations would address water quality standards, waste treatment and discharges, sampling, aspects of a comprehensive plan, even including the novel possibility of effluent fees.\textsuperscript{134}

To their advocates, discharge fees represented economic incentives for polluters to identify beneficial alternatives to existing production arrangements. Yet detractors viewed “pay-as-you-go pollution” as an endorsement of environmental contamination.\textsuperscript{135} In the end, the theoretical promise of the CWA’s effluent fee proposal remained dormant.

Coincident with the CWA, changes to historic federal fisheries legislation enhanced its utility as a mechanism for environmental protection. Eschewing the theoretical allure of certain CWA provisions, fisheries officials adopted a less overarching approach to water quality, one also designed—so they must have hoped—to avoid or reduce inter-governmental complications.\textsuperscript{136} Jack Davis, the pragmatic federal minister of fisheries who oversaw the 1970 amendments, viewed fish as a “first line of defence” against water pollution. “Anything that harms fish,” he asserted, “may be harmful to man himself,” thus, “a healthy environment and a healthy fishery” represented our “best insurance policy” against water pollution.\textsuperscript{137}

\textsuperscript{129} Canada Water Act, SC 1970, c 52.
\textsuperscript{130} See Booth & Quinn, supra note 99.
\textsuperscript{132} Canada Water Act, supra note 129, s 13(1).
\textsuperscript{133} Ibid, ss 9, 11.
\textsuperscript{134} Ibid, ss 9, 13(1), 15.
\textsuperscript{136} An Act to amend the Fisheries Act, SC 1970 c 63, s 3.
\textsuperscript{137} House of Commons Debates, 28th Parl, 2nd Sess, vol 6 (20 April 1970) at 6050 (Jack Davis).
Davis campaigned to stop industrial pollution “at the factory fence.” In contrast to the CWA, which espoused assimilation and flexibility, Davis envisaged uniform national standards that would override differences in the assimilative capacity of natural waterways. This approach was specifically intended to avert the risk that some jurisdictions would sacrifice environmental protection for short-term economic advantage. But subsequent federal governments declined to assert or explore the limits of their environmental powers; nor have courts generally sympathized with expansive constitutional interpretation of federal fisheries authority.

Neither the CWA nor fisheries legislation provided safeguards against the devastating impact of mercury. As the New York Times lamented in 1970, the possibility of harmful effects had been largely disregarded on the assumption “that mercury was insoluble and would lie forever quietly and inertly at the bottom of any body of water it reached.”

The tragedies at Islington (White Dog) and Grassy Narrows in Northwestern Ontario that resulted from mercury use in pulp and paper manufacturing undermined the well-being of aboriginal communities and destroyed valuable fisheries. A decade and a half was required to devise acceptable compensation for those along the English-Wabigoon River system who had been injured by mercury poisoning through the contamination of a food source, the loss of livelihood, or the destruction of established communities. But the lengthy process of identifying water-related environmental services and evaluating their contribution was at last underway.

Even explicit legislative initiatives failed to safeguard the general population from mercury. When mercury contamination forced the suspension of commercial fishing in parts of Manitoba, the province sought an injunction to prohibit further discharges from pulp mills in neighbouring provinces while attempting to recover financial losses.

Manitoba’s claim was grounded on the Fishermen’s Assistance and Polluter’s Liability Act, provincial legislation that imposed liability on any person who discharged a contaminant “into waters in the province or into any waters whereby it is carried into waters in the province.” Moreover, the Manitoba Act provided that the discharge was authorized through regulatory approval by declaring that such authorization would only be valid if the regulator also had jurisdiction “at the place where the contaminant caused damage to the fishery.”

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138 Ibid.
139 Ibid at 6052–6053.
140 See Harrison, supra note 100 at 4.
145 Fishermen’s Assistance and Polluter’s Liability Act, CCSM 1988, c F100, s 4(1).
146 Ibid, s 4(2).
In striking down the Manitoba statute, three Supreme Court of Canada judges insisted that Manitoba’s legislative authority was territorially-limited. Manitoba’s statute, accordingly, could not operate so as to undermine the effect of legislation passed in neighbouring jurisdictions, even in an obvious attempt to safeguard the interests of its own residents, and even in the context of a “truly interprovincial” pollution problem.\(^{147}\) A judicial preference for clean jurisdictional boundary lines over politically-inconvenient watersheds was firmly in evidence.

With characteristic clarity, Chief Justice Laskin dissented. He asserted that, “a province having rights to property therein is entitled to protect those rights against injury … by bringing or authorizing actions for damages, either at common law or under statutory provision.”\(^{148}\) In Laskin’s view, Manitoba law applied to the polluting companies in neighbouring provinces because their operations “caused damage to a fishery in Manitoba by discharging a contaminant into waters flowing into Manitoba.”\(^{149}\) Although local licenses authorized the discharges, these permits could not “entitle each of them with impunity to send their pollutants into the waters of another province,” in effect creating “an extra-territorial privilege.”\(^{150}\)

The impact of phosphates on Great Lakes water quality was among the factors underlying the IJC Water Quality Reference leading to the Great Lakes Water Quality Agreement of 1972 between Canada and the United States.\(^{151}\) The concept of eutrophication—a process whereby nutrient enrichment stimulates excessive growth of aquatic plant life—entered the public domain as algal blooms in Lake Erie, in particular, came under renewed scrutiny. Here, 137,000 lbs. of phosphorus were added daily, some 72 percent of which came from municipal wastes, two thirds of that amount attributable to detergents.\(^{152}\)

In protests against James Bay hydro-electric power development, Quebec’s Cree communities emphasized aboriginal interests in resource use and environment as the basis for injunctive relief. A decision by Justice Albert Malouf in 1973 to award an injunction against a massive river diversion and power development proposal in northern Quebec (although later reversed) severely constrained the immediate ambitions of Hydro-Quebec and Premier Robert Bourassa.\(^{153}\) Following that landmark judgment, hydro-electric power development became

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147 See Interprovincial Cooperatives et al v R, [1976] 1 SCR 477 at 514, 525, 53 DLR (3d) 321 [Interprovincial Cooperatives]. Justice Ritchie, on the basis of conflict of laws principles, reached a conclusion that supported the defendant industries.

148 Ibid at 495.

149 Ibid at 498.

150 Ibid at 499; see also Michael Terry Hertz, “Interprovincial, the Constitution, and the Conflict of Laws” (1976) 26:1 UTLJ 84.


152 Reitze, supra note 89 at 4–26.

increasingly subject to questions on social, environmental, and aboriginal rights grounds, even if the momentum behind very significant projects persisted elsewhere.\(^{154}\)

1.13. 1980s: Making Water Policy

Prescient, despite its imperceptible impact, a Globe and Mail editorial anticipated “jolting news” on the water front: “by being almost criminally negligent about looking after our fresh water, we are headed for long-range, deep trouble.”\(^{155}\) Domestically, this insight coincided with an important initiative by the Senate of Canada on soil and water conservation,\(^{156}\) and the commencement of a wide-ranging Federal Water Inquiry into the use and protection of water resources.\(^{157}\) At the international level, similar considerations were implicated as the World Commission on Environment and Development (WCED) analyzed the challenge of integrating environmental protection alongside economic development and thereby promoted awareness of sustainability.\(^{158}\)

For its part, the federal inquiry, completed in 1985, foreshadowed a statement on Federal Water Policy.\(^{159}\) Twenty-five specific policy recommendations were formulated in conjunction with five strategic directions: water pricing, science leadership, integrated planning, public awareness, and legislation. In proposing to “renew, consolidate or otherwise strengthen the application of existing federal legislation,” the legislative strategy affirmed “a clear need to modernize the legislative base to make it more anticipatory and comprehensive and, to protect the health and safety of Canadians and the many values of water and related resources.”\(^{160}\) Among the primary legislative challenges were inter-jurisdictional issues relating to water level and flow regulation, life-cycle management of toxic substances, water quality standards and guidelines to protect human and ecosystem health, and appropriate enforcement and compliance measures.\(^{161}\)

The introduction of sustainable development to Canada’s national agenda following publication of the WCED’s Brundtland Report was immediately signaled in legislation,\(^{162}\) and in water policy, most explicitly perhaps in the Science Council of Canada report Water 2020: Sustainable Use for Water in the 21st Century, a document that signaled the end of the era of “superabundance.”\(^{163}\)


\(^{156}\) Senate of Canada, Standing Committee on Agriculture, Fisheries and Forestry, Soil at Risk: Canada’s Eroding Future (1984) (Chair: Senator H.O. Sparrow).

\(^{157}\) See Pearse, supra note 128.


\(^{160}\) Ibid at 8.

\(^{161}\) Ibid.

\(^{162}\) For a comprehensive statutory inventory on sustainability in Canada, see Natasha Affolder, “The Legal Concept of Sustainability” (Symposium Presentation, University of Calgary, March 2012), Appendix 1, online: <www.cirl.ca/files/cirl/natasha_affolder-en.pdf>.

\(^{163}\) See Science Council of Canada, “Water 2020: Sustainable Use for Water in the 21st Century” (Ottawa: Science Council of Canada, 1988); see also Bruce Mitchell & Dan Shrubsole, Canadian Water
After the Brundtland Report and the 1992 Rio conference on environment and development, several Canadian legislatures aligned themselves—at least rhetorically—with the sustainable development principle. Neither the full implications, nor the applicability of sustainability to water management would have been well understood. In the years to come, however, sustainability—however difficult to define—assumed a more definite place in the framework for water governance.\(^\text{164}\) Integrated water resources management (IWRM) emerged alongside sustainability. While drawing upon some earlier conceptualization, IWRM derived a significant impetus from the “Dublin Statement on Water and Sustainable Development,”\(^\text{165}\) with a widely-recognized formulation: “a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.”\(^\text{166}\)

As Alberta’s longstanding plans for irrigation development along the Oldman River approached fruition, historic dimensions of water law figured prominently in constitutional analysis of the scope and applicability of federal arrangements for environmental assessment.\(^\text{167}\) Supreme Court Justice La Forest reviewed the evolution of the historic *Navigable Waters Protection Act*.\(^\text{168}\) He linked its origins to early controversies over the constitutionality of provincially-authorized interference with the public right of navigation, but pointedly noted the environmental character of disputes over sawmill and lumber wastes: “some provisions of the *Navigable Waters Protection Act* are aimed directly at biophysical environmental concerns that affect navigation.”\(^\text{169}\) La Forest’s argument was that the *NWPA*, as a consequence of the common law context in which it was enacted, “has a more expansive environmental dimension.”\(^\text{170}\)

At least one issue, acid rain—with its devastating impact on forest lands and water quality—was sufficiently alarming, documented and wide-ranging in its implications to compel remedial action. Through a series of international and federal-provincial agreements, successful measures were implemented to reduce damaging emissions of sulphur dioxide and nitrogen oxides dramatically in order to promote recovery.\(^\text{171}\)

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164 See Part II below.
169 *Ibid* at 66.
170 *Ibid* at 67.
1.14. 1990s: Water Traders

Free trade negotiations, initially conducted on a bilateral basis between Canada and the US, and then involving Mexico at the North American level, led to renewed Canadian anxiety over bulk water exports. Concern was heightened later in the decade by a series of controversial incidents: Ontario actually issued a permit authorizing the removal of Lake Superior water for export, while Quebec and Newfoundland ruminated more or less enthusiastically about offshore sales prospects. British Columbia’s hesitant and uncertain approach to exports also provoked a potentially costly trade dispute with Sun Belt Water of Santa Barbara, California.

In a singularly dismissive intervention, the *Globe and Mail* scoffed at public apprehension, declaring “the fuss” over water exports to be “truly strange.” Editorialists glibly observed that “Canada has lots and lots of water.” If other places wanted to buy some, “[w]hy shouldn’t they?” For water which “falls from the sky” constitutes “the ultimate renewable resource.” To alleviate domestic fears, the editorial emphasized that “exporting some of the water from our brimming lakes and rushing rivers will not cause anyone in Canada to go thirsty. If, for some unimaginable reason, it does, there is a simple solution: Turn off the tap.”

Turning off the tap had appeared more problematic to earlier generations when hydro-electricity exports were under consideration, while, unimaginably, water shortages in Ontario—though unrelated to exports—triggered the formulation of a provincial low-water response plan later the same year.

In examining these matters, the International Joint Commission called attention to the importance of ecosystem integrity in the Great Lakes basin and underscored the linkages between surface and groundwater management on the policy agenda. Appreciation of groundwater supplies remains uncertain, although initiatives to understand and assess Canadian

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groundwater resources have recently been renewed. Recent studies highlight persistent limitations in groundwater regimes relating, for example, to the lack of integration between quality and quantity considerations or continuing disregard for ecosystem and in-stream flow protection.

1.15. 2000s: Drinking Water Safety

Public health and safety—aspects of drinking water supply that were long regarded as essentially resolved—re-emerged dishearteningly in the twenty-first century, with harmful incidents at Walkerton, North Battleford and Kashechewan spawning public inquiries into water treatment failures. For their part, although Canada remains without national drinking water standards, provincial legislators responded with new regulations, technological changes, and investments intended to enhance drinking water safety. Drinking water quality guidelines, for example, were re-formulated as enforceable regulations in several jurisdictions. In addition, reporting and accountability regimes were enhanced, while legislators’ interest grew in water source protection initiatives with implications for land-use and planning. Indeed, a comprehensive review of drinking water and environmental challenges preceded Walkerton in the form of Quebec’s Rapport Beauchamp and its endorsement of the watershed framework and the ecosystem approach.


183 Drinking Water Protection Act, SBC 2001, c 9, Part 4–5; Clean Water Act, SO 2006, c 22; Règlement sur la qualité de l’eau potable, RLRQ, c Q-2, r 18.1.1.

Well before the widely-publicized 2005 drinking water failure at Kashechewan, a remote First Nation community on the Albany River in northern Ontario, concerns about the vulnerability of the aboriginal water supply systems were being expressed. Justice O’Connor, in the Walkerton report, commented specifically on First Nations water systems, insisting in a manner that questioned long-established jurisdictional frameworks that “[t]here can be no justification for acquiescing in the application of a lesser public health standard on certain residents of Ontario than that enjoyed by others in the province.” From a national perspective, the Commissioner of the Environment and Sustainable Development reported that “residents of First Nations communities do not benefit from a level of [drinking water] protection comparable to that of people who live off reserves.”

This disparity was at least partly attributable to the absence of formal legal and regulatory requirements. Although departmental policies and administrative guidelines did address the provision of safe drinking water in First Nations communities, this approach “does not cover all the elements that would be found in a regulatory regime for drinking water, and it is not implemented consistently.” An expert panel on aboriginal drinking water systems reported on operational shortcomings and financial constraints in a manner that sought to be respectful towards aspirations for self-government.

In a progress report, the Minister of Indian Affairs and Northern Development reviewed developments pursuant to a 2006 Plan of Action for Drinking Water in First Nations Communities, itself the successor to the First Nations Water Management Strategy of 2003. The number of high risk First Nations water systems had been brought down from 193 to 85; in addition, the list of 21 priority communities (those at high risk and subject to a drinking water advisory), had been reduced to six. Notwithstanding financial allocations including 185


Health Canada’s Drinking Water Safety Program for Native People was underway at least as early as 1991, see The Ontario Pilot Project: A First Nations Water Treatment Plant Operators Training Program, by Siobhan Arnott & Jim Ranson (AFN Environment Unit, June 1996) at 3.


Safe Drinking Water for First Nations, supra note 180.

Indian and Northern Affairs Canada, “Plan of Action for Drinking Water in First Nations Communities: Progress Report” (INAC, 2008) at ii, 6, online: <www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ/
$330 million in the 2008 federal budget and $165 million in the stimulus spending plan of January 2009, aboriginal drinking water and sanitation systems continue to present significant challenges related to financing, inter-governmental co-ordination, governance, and to the comparatively isolated location of a number of the communities in question.

In addition to drinking water concerns on First Nations reserves, more than 1750 boil water advisories were reported in other communities across Canada. The broader drinking water safety issue revived discussion about appropriate roles for the public and private sectors in municipal water supply. In this context, some commentators wondered whether consumer enthusiasm for bottled water would compromise the quality of the public supply; vigorous criticism of bottled water in Canadian churches and on university campuses also reflected linkages to concerns about water access on a global basis, and to persistent pressure for some form of recognition of a human right to water.

Export proposals have been particularly prominent in Quebec, with one line of argument being that “it is our duty, as exceptionally well endowed holders of freshwater resources, to study realistically and openly the various options regarding their development.” A broader
Canadian approach to exports and the ecological integrity of water basins was formulated by independent experts and eventually appeared in revised bulk water export legislation.198

1.16. BUILDING ON THE FOUNDATIONS

Major water allocation decisions, together with public health and environmental initiatives, have historically been made on the basis of commitments reflected in legislation, public and private investments, and community expectations. Existing arrangements are both deeply entrenched and broadly grounded, for certain familiar and widespread assumptions about water have been fundamental to social and economic activity ranging through energy production, transportation facilities, municipal supply, recreation, and agriculture. Thus, we may continue to expect important elements of the established legal and institutional framework, as described in Part I, to guide or channel water-related decision-making for some time to come. This is so because “institutional arrangements for water develop and change over time, but earlier decisions and rules set limits on what can happen.”199

Significant elements of the historic arrangements for water allocation and quality protection remain or are again on the agenda. Recent issues include legislative reform to fisheries and navigable water legislation, the public/private debate, sewer and drinking water systems standards and renewal, and conservation challenges. In addition, major agreements such as the Columbia River Treaty are due for reconsideration. The evolution of water policy heavily conditions the water policy future whether the issue is the infrastructure of water extraction and distribution, allocation and priorities, or environmental degradation and remediation.

Before outlining general directions in contemporary water legislation and policy initiatives in Part III, it will be helpful to assess some of the background assumptions whose evolution provides context for current developments and reform.

2. PART II BACKGROUND ASSUMPTIONS IN TRANSITION

Ideas, principles, values, and attitudes concerning water are—metaphorically—like reservoirs, channels, and pipes that constitute embedded infrastructure and are not readily dislodged or replaced. Arrangements are subject to change, of course, but that change is likely to be incremental in nature rather than sudden, comprehensive and dramatic. Short of catastrophic upheaval in response to some profound and unanticipated disruption, any lasting change in a deeply-rooted and broadly-based intellectual framework will require some re-engineering of underlying assumptions.


Three key assumptions largely underpinned the water use and management decisions described above. Firstly, with limited regional exceptions water was presumed to be in ample supply—according to the Science Council even “superabundant.” Accordingly, as explicitly articulated from time to time water was taken for granted as an essentially free resource to be allocated, utilized, or even degraded at no cost or charge. Management arrangements were designed with a virtually exclusive focus on accommodating human preferences somewhat over-inclusively described as needs. These were also effectively unlimited. Secondly, environmental considerations were subordinated, if not entirely disregarded, in the issuance of approvals for dams, diversions, and discharges. Thirdly, arrangements for governing water were generally developed within established local and domestic frames of reference. Water policy, with certain important exceptions involving IJC deliberations, was largely unencumbered by practical considerations or intellectual influences emanating from beyond national borders.

Within a relatively brief time period, these three underlying assumptions around the availability of clean water, the unquestioned precedence of human uses over environmental considerations, and the largely local and domestic priorities of Canada’s water agenda are being tested, with consequences still to be determined.

2.1. The Availability of Water

Casual interventions such as the popular characterization of water as “the ultimate renewable resource” are not unique. Over the past quarter century, widely circulated estimates have suggested that Canada has somewhere between 20 percent and two thirds of the world’s fresh water supply. Yet vigorous challenges are now directed against what is termed the “myth of abundance.” One limnologist, for example, attributes a pattern of overestimation to reliance on data regarding the volume of fresh water contained in Canadian lakes, an amount that is approximately 20 percent of the water in all of the world’s lakes. We are cautioned, however, against confusion between that water and the renewable supply.

The renewable supply is what falls from the sky and runs off in rivers, often passing through lakes as it moves to the sea. Some goes underground, replenishing aquifers that can be tapped by wells. These flows are renewed every year and count as the water supply.

As reported by Statistics Canada, 38 percent of the country’s renewable supply falls in the south where 98 percent of the population resides. Taking into account that 60 percent of the renewable supply flows northward and is therefore unavailable to the bulk of the population, and noting the supply of renewable water resources available to other countries, John Sprague suggests that “the number that should spring to the minds of Canadians when they contemplate the country’s water resources” is 2.6 percent of world supply, that is, the supply of water available is not as generous as previously imagined.

201 John B Sprague, “Great Wet North? Canada’s Myth of Water Abundance” in Bakker, supra note 75 at 23.
203 Sprague, supra note 201 at 25.
Notwithstanding aggregate flows at a national level, Canadians have experienced local or regional water shortages. More are anticipated, notably in parts of Western Canada where climate change impacts are expected to lessen the availability of melt-water.204 Fluctuating or declining water levels in the Great Lakes system are also a source of concern with inquiry focussed on “how to manage fluctuating lake levels in the face of uncertainty over future water supplies to the basin while seeking to balance the needs of those interests served by the system.”205 For southern Canada, Statistics Canada has estimated an overall loss of 8.5 percent of the water yield or run-off in the 34 year period from 1971 to 2004.206 Today, therefore, it is more common to acknowledge uncertain availability, particularly on a regional level. Such uncertainty, as suggested by the National Round Table on the Environment and the Economy, signals the virtues of an anticipatory response: “New stresses and demands are likely to pose a significant challenge to the sustainability of Canada’s water resources if action is not taken now.”207 The prospect of shortages is thus in contemplation.

2.2. Environmental Values of Water

A second aspect of re-conceptualizing water resources rests on the proposition that these might legitimately be needed for purposes extending beyond immediate human consumptive or productive use, an understanding that was significantly advanced through the Millennium Ecosystem Assessment program.208 Largely (if not entirely) purged from contemporary debate are covetous laments about the “waste” of water that flows uselessly into the oceans. Instead, we observe a far greater willingness to acknowledge the vital contribution of environmental flows—however poorly these may be understood.209 Importantly, this awareness is associated with an understanding that human demands for water may have to be moderated to respect the underlying requirements of sustainable natural systems. Thus, initiatives to safeguard in-stream flows are becoming more common and the vulnerability of groundwater supplies to over-extraction is more widely recognized.


206 Statistics Canada, supra note 202 at 5.


At a national level, the contribution of water to the natural environment has also been linked to a re-framing of historic perceptions of abundance that simultaneously responds to international perceptions of Canadian water as discussed in the following section of this paper. A senior water policy specialist, for example, addresses the proposition that the availability of water in Canada is somehow unfair or inequitable: “7 percent of the world’s renewable water supply meets the ecological needs of about the same proportion of the world’s landmass, so from an ecological perspective, we have no water to spare.” Canada, in other words, receives and uses its fair share. From a sectoral perspective, however, pressure towards water conservation may be increasing, for example, in agriculture.

2.3. Acknowledging the International Context

Thirdly, by way of background assumptions, it is significant that international observers express increasing interest in the Canadian water situation and assess the country’s water issues from a different perspective. Viewed from a distance, Canada “houses less than 2 percent of the world’s population but contains 23 per cent of its fresh water, compared to Asia, which is home to 60 per cent of the world’s population and has access to less than 37 per cent of global freshwater supplies.” Implicitly, this statistical comparison suggests potential unfairness in the global distribution of freshwater. Still more provocatively, a former head of the North American Commission on Environmental Cooperation reportedly remarked: “You know you have 27 percent of the world’s water supply. What makes you think that the world will allow you to keep it all?” Such observations underpin speculation that “Canadian water will become a source of global envy.” As the new century began, deliberations associated with the Stockholm Water Symposium (2001) were expected to involve discussion of arrangements for sharing Canada’s water and the food produced with it on a global basis. Growing global demand for food is a significant driver of water-intensive agricultural production in Canada.

More generally, manifestations of water awareness at a global level include World Water Day and the water and sanitation objectives of the UN Millennium Development Goals and their post-2015 successors, the Sustainable Development Goals. It is notable that United Nations institutions have identified elements of a “global water agenda” and suggestions


concerning “global water governance” are now in circulation. It has also been suggested that freshwater resources might usefully be considered “a common concern of humankind.”

On the basis of its international and humanitarian significance, segments of Canadian society embraced possible recognition of a human right to water. It has even been argued that the endorsement of such a right might serve, instrumentally, to inspire domestic water management reform: “Adopting water as a basic human right … would offer a unifying theme, which will drive and compel us to organize our thinking and resources in a collaborative manner.” This collaboration would apparently extend to data systems, policy formation, the re-structuring of relevant organizations, and to new forms of governance. Moreover, it is argued that Canadian commitment to a human right to water could even be expected to promote discussion of “the financing of water supply and treatment systems, demand-side management, and watershed planning and management.” Whatever one might make of the leverage potential attributed to the human rights paradigm, it provides some indication concerning increasing international influences on Canadian deliberations regarding water.

Commentators and policy makers are also now actively exploring global opportunities to promote water research, technological innovation, and investment related to the possibility that Canada might be conceived of as “a water solutions country.”

To summarize, the overall shift in background assumptions encompasses three elements: (1) acknowledgement that Canada’s available water supplies are not so unlimited as might once have been imagined, (2) understanding that the importance of water to environmental sustainability can no longer be disregarded, and (3) recognition that there may be international interest in the effectiveness of Canadian water stewardship, especially in efforts to promote conservation and drinking water quality. Although it would be premature to suggest that the attitudinal transformation has been complete or comprehensive, the influence of these shifts is becoming apparent in water law and policy. Part III examines a number of key developments

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219 See Maude Barlow & Tony Clarke, Blue Gold: The Battle Against Corporate Theft of the World’s Water (London: Earthscan, 2003), ch 10; United Church of Canada, supra note 196; Human Right to Water, supra note 53.


221 Ibid. Comparable suggestions that constitutional recognition of environmental rights in Canada might ensure access to safe drinking water for all Canadians are discussed in David R Boyd, The Right to a Healthy Environment: Revitalizing Canada’s Constitution (Vancouver: UBC Press, 2012) at 146–147.


223 See David Crane, Canada as the Water Solutions Country: Defining the Opportunities (Waterloo, Ont: Canadian Water Network, 2013); see also Water Opportunities Act, SO 2010, c 19, Schedule 1.
that are unfolding at the intersection of historic water management arrangements and the evolution in underlying assumptions.

3. PART III SECURING SAFE AND SUSTAINABLE ABUNDANCE

Recently, prominent water policy specialists have elaborated a concern for water security in a significant report. This has taken on broader significance in the twenty-first century than it did in the Depression era. Researchers have described a “multi-dimensional” concept of water security, which recognizes that “good quality water is needed for social, economic and cultural uses while, at the same time, adequate water is required to sustain and enhance important ecosystem functions.” The report identified seven aspects of the water security agenda: ecosystem protection, economic productivity, equity, the integration of water quantity and water quality considerations, conservation, climate variability and change impacts, and the co-ordination of trans-boundary allocation decisions.

This thoughtful analysis ultimately encourages a course of action that might be summarized in the following way: With conscientious regard for the indispensable ecological foundations of the productive livelihoods they seek to encourage in an equitable manner, Canadians must simultaneously be attentive to the availability and quality of water (including drinking water), and bear in mind that water supply is not unlimited, but is subject to climatic impacts and in certain circumstances must be managed in collaboration with neighbouring jurisdictions. This new direction captures significant adjustments in historic assumptions and raises the question of accompanying shifts in policy and law.

Future risk of shortages and threats to water quality are currently addressed through the inter-connected cluster of laws, policies, institutions and practices whose long-term evolution has been reviewed above. These arrangements are subject to continuing adjustment and adaptation, but recognition of the underlying continuity is a reminder that emerging challenges will require carefully considered responses. There are indications, though, that initiatives associated with changing assumptions and the acknowledgement of uncertain risks are having an impact. Current initiatives are oriented generally around three broad themes: sustainability (suggesting new standards for decision-making), conservation (suggesting greater awareness of the value of water), and watersheds (representing a promising institutional re-configuration).

3.1. Sustainability

Within Canadian legislation, sustainable development commonly appears as a loosely-defined benchmark. The federal Auditor General Act presents it as “a continually evolving concept based on the integration of social, economic and environmental concerns” that might entail health and ecosystem protection, promoting equity including the needs of future generations, pollution prevention, or an integrated approach to planning and natural resource


225 Ibid at iii.

226 Ibid.
decision-making, among other approaches. More specific attempts have also been made to refine sustainability as it applies to water.

The Canadian Water Sustainability Index (CWSI) was envisaged as a composite profile of water issues that would facilitate long-term comparison between communities. Five key components, each further divided into more measurable indicators, constitute the assessment framework. The five key components address freshwater resources directly: ecosystem health, infrastructure, human health and well-being, and community capacity. More detailed information is assembled for each. In the case of Ecosystem Health, for example, the CWSI reports on Ecosystem Stress, Ambient Water Quality and Native Fish Populations. The CWSI may contribute to policy-making in several respects: fundamentally, it promotes awareness of the overall state of fresh water; secondly, it facilitates standardized comparison between different communities, and thereby helps to identify priorities between and within those communities. More generally, the index encourages progress towards integrated water resources management. Less elaborately, Statistics Canada indicates that “for water use to be sustainable, water withdrawals must not exceed renewal over a given time period, and there must be sufficient water of appropriate quality to satisfy ecological requirements.”

In 2003, water was identified as a federal sustainable development priority and became the focus of inter-ministerial deliberations endorsing as a vision, “clean, safe, and secure water to meet their needs in ways that also maintain the integrity of ecosystems.” Endorsement of sustainability as a goal or objective raises complex issues concerning how this end will be achieved and performance measured. As monitoring and assessment tools are introduced, however, new challenges have arisen in connection with the standardization and comparison of indicators. Appropriate human uses and their relationship to background or instream water

227 Auditor General Act, RSC 1985, c A-17, s 21.1.
229 Ibid at 51.
231 Statistics Canada, supra note 202 at 12.
234 Karen Bakker & Christina Cook, “Water Governance in Canada: Innovation and Fragmentation” (2011) 27:2 Intl J Water Resources Development 275 at 279 (approximately 275 indicators related to fresh water have been developed and introduced with attendant challenges in terms of comparison and standardization); on the role of monitoring and assessment tools in Canadian water management, see Emma S Norman, Karen Bakker & Gemma Dunn, “Recent Developments in Canadian Water Policy: An Emerging Water Security Paradigm” (2011) 36:1 Can Water Resources J 53.
requirements (increasingly in the context of additional uncertainty associated with climate change impacts on water availability), require careful consideration, as several recent national studies demonstrate.\textsuperscript{235}

Whether goals are formulated around ecological health and integrity, or protection of the aquatic environment, or in relation to the security of drinking water supplies, scientific information and insight is required to support the decision-making process, and in response to uncertainty, the precautionary principle is occasionally engaged.\textsuperscript{236} Legislative and policy initiatives along these lines are underway in several jurisdictions, including British Columbia, Alberta and Quebec.\textsuperscript{237}

British Columbia’s \textit{Water Sustainability Act} incorporates both “environmental flow needs” defined as “the volume and timing of water flow required for the proper functioning of the aquatic ecosystem of the stream” and the concept of “critical environmental flow” (CEF).\textsuperscript{238} The latter is explained as “the volume of water flow below which significant or irreversible harm to the aquatic ecosystem of the stream is likely to occur.”\textsuperscript{239} In addition to prospective requirements that environmental flow needs be considered in licensing decisions,\textsuperscript{240} CEFs could operate as a regulatory trigger to authorize CEF protection orders in periods of significant water shortage.\textsuperscript{241} More comprehensively, the new BC legislation provides for water sustainability plans to be developed in order to address conflicts between users and environmental flows, or in response to risks to water quality or ecosystem health, or to promote restoration.\textsuperscript{242}

For its part, Alberta has pursued sustainability on the basis of a policy or strategy first articulated in 2003 as \textit{Water for Life} and intermittently renewed thereafter.\textsuperscript{243} The initiative adopted performance measures to monitor effectiveness. In connection with drinking water

\begin{footnotesize}
\textsuperscript{235} See e.g. Council of Canadian Academies, \textit{Sustainable Management of Groundwater}, supra note 179 underscoring the importance of groundwater for human health, the economy and aquatic ecosystems; Natural Resources Canada, \textit{From Impacts to Adaptation: Canada in a Changing Climate 2007} (Ottawa: NRC, 2008) [Natural Resources Canada, \textit{Impact to Adaptation}]; Canada, National Round Table on the Environment and the Economy (NRTEE), \textit{Degrees of Change: Climate Warming and the Stakes for Canada} (Ottawa: NRTEE, 2010).

\textsuperscript{236} See Senate, Standing Senate Committee on Energy, the Environment and Natural Resources, \textit{Water in the West: Under Pressure} (November 2005) (Chair: Hon Tommy Banks) at 17, recommending institutional and methodological improvements to strengthen the data base and decision-making concerning western Canadian water resources; see also Nigel Bankes, “Policy Proposals for Reviewing Alberta’s Water (Re) Allocation System” (2010) 20:2 J Envtl L & Prac 81; for an illustration of the precautionary principle in the context of water allocation, see \textit{Dillon v Ontario (Ministry of the Environment, Director)}, (2000) 36 CELR (NS) 141 (Ontario Environmental Review Tribunal) at 15; \textit{The Water Resources Conservation Act}, CCSM c W72, Preamble, para 3.

\textsuperscript{237} In addition to examples discussed below, see \textit{Water Opportunities Act}, supra note 223 (Part III: “Municipal Water Sustainability Plans and Performance Indicators and Targets”).

\textsuperscript{238} \textit{Water Sustainability Act}, SBC 2014, c 15, s 1.

\textsuperscript{239} \textit{Ibid.}

\textsuperscript{240} \textit{Ibid.}, s 15.

\textsuperscript{241} \textit{Ibid.}, ss 86–87.

\textsuperscript{242} \textit{Ibid.}, ss 64–85.

\end{footnotesize}
safety, the indicator addresses the performance in delivering safe drinking water and calls for continuous improvement of facilities and their operations. With reference to water quality, the strategy employs an index based on total loading on a river reach or basin basis for point source discharges. In order to assess water use efficiency and productivity, monitoring compares water consumption with productivity, population levels and economic growth. The overall effectiveness of Alberta’s Water for Life strategy remains to be established and concerns have been expressed that steps to date fail to emphasize the need for greater efficiency in irrigation, that controls are lacking on water use in the oil and gas sector, and that local, provincial and federal water agencies are inadequately co-ordinated.

Quebec, after an extended period of inquiry and deliberation, resolved to pursue the application of sustainable development principles to water management on legislative foundations. Recent water law reform not only incorporates sustainable development principles such as inter-generational equity, but specifically invokes the province’s Sustainable Development Act and the potential of water management initiatives to further sustainable development. Quebec’s legislation recognizes hydrologic units as frameworks for integrated approaches to water management which, among other objectives, should reconcile ecosystem needs with economic activities by, for example, limiting the duration of water withdrawal authorizations or establishing procedures to require restoration measures or to secure financial compensation.

3.2. Water Valuation and Conservation Measures

Water conservation initiatives reflect a growing appreciation of the value and contribution of water in the urban, industrial and resource sectors. Conservation programs seek to moderate usage through efficiencies, pricing mechanisms and other demand management measures. Voluntary, regulatory, and economic instruments are evident across Canada and have been under more systematic study by the Canadian Council of Ministers of the Environment and the Federal-Provincial Council of the Federation. By way of example, British Columbia


246 See An Act to affirm the collective nature of water resources and provide for increased water resource protection, CQLR c C-6.2 [Act to affirm the collective nature of water].


248 The polluter pay principle and an obligation to repair damage are set out in ibid ss 4, 6.

249 See Oliver M. Brandes et al, At a Watershed: Ecological Governance and Sustainable Water Management in Canada (Victoria: Polis Project on Ecological Governance, 2005) at ii endorsing the concept of ecological governance with emphasis on demand-side opportunities to achieve sustainability. For an earlier inventory of relevant initiatives, see D.H. Waller et al, Canadian Municipal Water Conservation Initiatives (Toronto: ICURR Publications, 1997).


251 Water efficiency labelling as well as conservation and efficiency plans are among the measures encouraged by the Council of the Federation in its 2010 Water Charter and now supported by a Water Stewardship
has begun to address water usage in washroom fixtures and has also begun to implement mandatory water efficiency advances through reforms to the Building Code, in conjunction with the modernization of provincial water legislation. Municipalities elsewhere promote reduced consumption through subsidy or rebate arrangements on bathroom fixtures. Calgary, approaching conservation on a comprehensive basis, embarked upon a 30-year program to reduce overall consumption by 30 percent. In the commercial and industrial building sector, green certification programmes recognize water conservation in the assignment of credits towards certification. The agricultural sector also offers opportunities for conservation. For example, a recent study on water and agriculture draws attention to conservation for sectoral sustainability with a particular focus on conservation agriculture and approaches to water management oriented around ecosystem services. Comprehensive conservation requirements are now also incorporated within water permit regimes, notably within the Great Lakes Basin.

Water pricing and economic incentives are becoming more widely used to encourage conservation. The introduction of charges for water services was highlighted as a key strategic direction in the formulation of the Canadian federal water policy a quarter century ago.

252 The mandatory installation of low flow (6 litres or less) toilets in all new construction and renovations in British Columbia is set out in the British Columbia Building Code, BC Reg 295/98, s 7.4.9.3.


254 See Water Sustainability Act, supra note 238; Government of British Columbia, “Water”, online: <www2.gov.bc.ca/gov/content/environment/air-land-water/water>.


259 Council of Canadian Academies, Water and Agriculture, supra note 211, ch 5.

260 Water Taking and Transfer Regulation, O Reg 387/04, s 6.

However, adoption of polluter pay and market-based instruments is by no means complete: between 1991 and 2011, the percentage of Canadian households equipped with water meters rose only from 52 percent to 58 percent.\textsuperscript{262}

A leading analyst of water pricing sharply criticized Canadian water pricing practices for failing to generate the revenues needed to support water agencies, for failing to inform consumers about the full costs of water-use decisions, for failing to protect relevant ecosystems, and for a lack of basic fairness.\textsuperscript{263} The OECD advanced an equally critical assessment: “In a country where the public often regards water as a limitless resource and a gift of nature, the notion that water is also an economic good with social and ecological functions is not yet readily accepted.”\textsuperscript{264} This effectively affirms that in the water sector, established practices grounded on long-held assumptions are not readily displaced.

As outlined above, the Walkerton Inquiry is best known for its advocacy of source-to-tap water quality protection measures. Nevertheless, in conjunction with his overall investigation of water security arrangements, Justice O’Connor noted the importance of ongoing infrastructure finance, renewal, and upgrading—\textsuperscript{265}all elements of the constant vigilance over drinking water he sought to encourage.\textsuperscript{266} Ontario responded with legislation outlining arrangements for financing that were intended to meet the full cost of water and sewerage services, with the full cost of providing water services defined to include: “source protection costs, operating costs, financing costs, renewal and replacement costs and improvement costs associated with extracting, treating or distributing water to the public.”\textsuperscript{267} The proposed legislation, subsequently repealed in favour of alternative measures, called for the preparation of reports that would provide an inventory and management plan for the necessary water services infrastructure accompanied by an assessment of the full cost of those water services and the revenue obtainable for that purpose.\textsuperscript{268} Given empirical indications that something between 16 percent and 55 percent of water supply and sewage costs are excluded or under-estimated, the challenge of closing the full-cost gap in Ontario is substantial.\textsuperscript{269} An administrative cost recovery charge of $3.71 per

\begin{footnotesize}
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\item See Renzetti \textit{supra} note 262 at 277; for an updated elaboration, see CD Howe Institute, “Wave of the Future: The Case for Smarter Water Policy”, by Steven Renzetti, Commentary No 281 (2009). There is little indication in recent public opinion research that water pricing and conservation incentives are widely understood or appreciated; see Canadian Partnership Initiative, RBC & Unilever Canada, “Canadian Water Attitudes Survey” (2011) at 1–2, online: <www.rbc.com/community-sustainability/_assets-custom/pdf/Water-Attitudes-Study-nr-Mar_2011.pdf>.
\item OECD, \textit{supra} note 262 at 70.
\item \textit{Ibid} at 8.
\item \textit{Sustainable Water and Sewage Systems Act}, SO 2002, c 29, s 3(7).
\item \textit{Ibid}, ss 3, 4.
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million liters per year, introduced in 2009 to designated sectors including water bottling and beverages, fruit and vegetable canning, and concrete manufacturing, is not considered to represent a significant incentive towards conservation.

Quebec has most explicitly embraced user pay principles in the water context with a formal provision establishing that: “The costs related to water resource use, including protection, restoration, improvement and management costs, are to be borne by users under the conditions defined by law and on the basis of environmental, social and economic consequences and the polluter pays principle.” British Columbia’s Water Sustainability Act now extends application fees and annual rental charges to non-domestic users of groundwater resources.

The broader array of market-based instruments (MBIs), including trading of water rights, or water quality (pollution) credits, is expected to offer cost effectiveness and enhanced flexibility in terms of compliance while simultaneously promoting innovation. Again, however, implementation and understanding of their implications remains limited in Canada. Thus, a federal study of MBIs reported “surprisingly limited efforts” to assess these initiatives. The study concluded on an interim basis that data limitations preclude informed decision-making about MBIs: that the evaluation of policy effectiveness and communication of relevant learning is generally lacking, and that clear assessment measures are rarely established.

At the international level, certainly within the Great Lakes context, an Ontario permit to take water for export triggered extended negotiations and deliberations that culminated in basin-wide agreement involving Canadian and American jurisdictions. More elaborate

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270 Charges for Industrial and Commercial Water Users, O Reg 450/07, s 7(1).
272 Act to affirm the collective nature of water, supra note 246, s 4.
273 Water Sustainability Act, supra note 238, s 125.
275 Cantin, supra note 274 at 38.
procedures governing withdrawals, diversions and consumptive uses of Great Lakes waters are indicative of the growing significance of efficiency and conservation in water allocation and management.\textsuperscript{278} Within an overall framework founded on a general prohibition against new or increased Great Lakes diversions, provision is made for exceptions where applicants demonstrate that “[t]he need for all or part of the Exception cannot be reasonably avoided through the efficient use and conservation of existing water supplies.”\textsuperscript{279} In any case, the exception will not exceed “quantities that are considered reasonable for the purposes for which it is proposed.”\textsuperscript{280} Participating jurisdictions have implemented decision-making arrangements consistent with the framework agreement.\textsuperscript{281} At the federal level, proposals to prevent exports have been made on the basis of a prohibition against inter-basin transfers, a restriction intended to address environmental risks.\textsuperscript{282}

At a still higher level of environmental concern, climate change considerations accentuate water conservation requirements and management challenges. For example, rainfall may replace snowfall as a source of precipitation with implications for run-off patterns and storage arrangements. Other scenarios forecast increased variability or seasonal adjustments in precipitation, or water shortages.\textsuperscript{283} Yet if anticipated water shortages heighten operational challenges and increase pressure for conservation as an element of adaptation to climate change, there are countervailing impulses towards greater water use: the impact of greenhouse gas emissions on climate change may promote reliance on non-carbon based energy sources such as hydro or nuclear power, each dependent on massive water usage.\textsuperscript{284} On the other hand, climate change presents the potential for unusually high precipitation in certain regions.\textsuperscript{285} The varied possibilities obviously highlight very different sets of policy responses.

3.3. Watershed Management and Participation

Institutional changes in the form of enhanced recognition of watersheds as appropriate frameworks for decision-making are also increasingly evident. Once popular in association with

\textsuperscript{278} Great Lakes–St. Lawrence Agreement, supra note 277, art 203; see generally Peter Annin, The Great Lakes Water Wars (Washington: Island Press, 2006).

\textsuperscript{279} Great Lakes–St. Lawrence Agreement, supra note 277, art 201(4)(a).

\textsuperscript{280} Great Lakes Basin Sustainable Water Resources Agreement, 13 December 2005, Article 201, cl 4.


\textsuperscript{282} See An Act to amend the International Boundary Waters Treaty Act and the International River Improvements Act, SC 2013, c 12.


\textsuperscript{285} See National Resources Canada, Impact to Adaptation, supra note 235.
the objective of maximizing water resource use, the watershed perspective has experienced a
revival alongside emerging concern with ecosystem health and sustainability, with implications
for both water supply and the protection of aquatic ecosystems. As explained by Dan Tarlock,
a leading American water law specialist, contemporary watershed management shifts attention
towards pollution prevention in an ecorealistic context, reflecting awareness that “we can only
sustain biodiversity by managing entire ecosystems.” From a legal perspective, an ecosystem
orientation represents a noteworthy shift in so far as “it collapses all conventional conceptual
and jurisdictional boundaries and potentially integrates public and private lands and water in
a single functional management unit.” In-stream flow protection and minimum ecosystem
requirements, alongside measures to safeguard drinking water sources, become crucial to
planning and decision-making. Accordingly, watersheds offer opportunities to address
longstanding governance challenges presented by jurisdictional fragmentation.

The process of policy integration around watershed frameworks is underway in the
Canada-US context through the IJC’s International Watershed Initiative, and in several
jurisdictions. In Alberta, alongside developments associated with Water for Life, watershed
planning and advisory councils are proposed or implemented for the Milk, Oldman, Bow,

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286 Norman, Bakker & Dunn, supra note 234 at 61 (roughly 80 percent of Canadian water and utility
managers and regulators view watersheds as the most suitable scale for watershed governance); for
discussion of ecosystem and watershed-related activity associated with the Canada Water Act as of the
40-year anniversary of that legislation, see Environment Canada, “Canada Water Act Annual Report
for April 2009 to March 2010” (Ottawa: Minister of the Environment, 2010), at 17–31; for a practical
conceptual introduction, see Peter Clancy, Freshwater Politics in Canada (Toronto: University of Toronto
Press, 2014) at 4–12.

287 A Dan Tarlock, “Putting Rivers Back in the Landscape: The Revival of Watershed Management in the

288 Ibid at 189; but see James M Omernik & Robert G Bailey, “Distinguishing Between Watersheds and

289 In Ontario, an intersecting series of water management provisions contributes to this result. Ontario
Water Resources Act, RSO 1990, c O.40, s 34. See also Clean Water Act, supra note 183, s 1, where the
“purpose … is to protect existing and future sources of drinking water”.

290 See Bakker & Cook, supra note 234; for further discussion of attractions (as well as limitations) of
planning, management and governance at the watershed level, see Alice Cohen & Seanna Davidson, “The
Watershed Approach: Challenges, Antecedents, and the Transition from Technical Tool to Governance
Unit” (2011) 4:1 Water Alternatives 1; Alice Cohen, “Rescaling Environmental Governance: watersheds
as boundary objects at the intersection of science, neoliberalism and participation” (2012) 44:9
Environment & Planning A 2207; Deborah Curran, “Water Law as a Watershed Endeavour: Federal

291 Murray Clamen, “The IJC and Transboundary Water Disputes: Past, Present and Future” in Norman,
Cohen & Bakker, supra note 35, at 70–71; see also Emma S Norman, Governing Transboundary Waters:
The United States and Indigenous Communities (London: Routledge, 2015) at 79–102.

292 Large scale ecosystem initiatives and inter-jurisdictional water management arrangements are highlighted
in the fortieth annual report of federal activity under the Canada Water Act; see Environment Canada,
Canada Water Act, Annual Report for April 2009 to March 2010 (EC, 2010), online: <publications.gc.ca/
Red Deer, Battle, North Saskatchewan, Cold Lake-Beaver River, and Lesser Slave Lake watersheds.293

Manitoba, in 2003, became the first province to designate a stand-alone department of Water Stewardship with sole responsibility for protecting and managing water. Here, too, the role of watersheds was more explicitly highlighted. The mandate of the Ministry of Water Stewardship (now again re-configured as a division within the Ministry of Sustainable Development) encompasses the protection of fisheries and aquatic ecosystems, drinking water safety, water and sewerage for rural communities, flood protection and the role of water in sustainability.294

The Manitoba Ministry assumed responsibility for the development and administration of legislation, including the Water Protection Act.295 This act recognizes the importance of comprehensive watershed planning and the contribution of science: where a watershed plan is required, it must “identify issues relating to the protection, conservation or restoration of water, aquatic ecosystems and drinking water sources in the watershed.”296 In addition, the plan is expected to address such issues as the protection of aquatic ecosystems and drinking water sources, water pollution, including wastewater, activities in water quality management zones, riparian areas, wetlands, flood areas, flood plains and reservoir areas, as well as water supply and distribution.297

Ontario’s Clean Water Act represents another watershed-based measure to safeguard sources of drinking water supply on a more comprehensive basis. The Clean Water Act is implemented through the actions of local committees to develop source protection plans based on identified threats to drinking water.298 Approximately 40 source protection areas and regions, broadly corresponding with the configuration of longstanding watershed-based Conservation Authorities, are established.299 Source protection committees representative of municipalities, of the agricultural, commercial and industrial sectors, and of general public interests, including environment and health, have been constituted.300 Source protection plans will take precedence over municipal land-use plans and zoning bylaws with the first approved plan covering the Lakehead area.

With particular reference to the water quality impacts of nutrients including nitrogen, phosphorus, and potassium, Ontario has also instituted measures to improve land-use practices

295 Water Protection Act, CCSM, c W-65.
296 Ibid, s 16(1)(a).
297 Ibid, s 16(1) (b). Manitoba has now taken steps to co-ordinate groundwater use and aquifer management with watershed planning; see The Groundwater and Water Well and Related Amendments Act, SM 2012, c 27, s 71.
298 See Clean Water Act, supra note 183.
299 See Source Protection Areas and Regions Regulation, O Reg 284/07.
300 See Source Protection Committees Regulation, O Reg 288/07.
affecting water quality in the agricultural sector. Other watershed oriented initiatives in Ontario include legislation “to protect and restore the ecological health of the Lake Simcoe watershed for the present generation and for future generations,” and a similar measure addressing the Great Lakes.

Roughly comparable initiatives may be found elsewhere, including Quebec, where measures to reform water governance on a watershed basis have been underway since the adoption in November 2002 of the Quebec Water Strategy, Water: Our Life, Our Future. An important legislative landmark proclaimed rights of decision-making in relation to water resources while endorsing an integrated approach to such decision-making which is to be carried out for “hydrologic units” including watersheds and sub-watersheds. Observers of the Quebec experience underscore the complexity of effective watershed governance as well as some ultimate limitations associated with inter-jurisdictional considerations and long-range air-borne pollution, for example. Important institutional adjustments around watersheds, as these examples from Alberta, Ontario, Quebec and Manitoba suggest, however, are underway.

CONCLUSION

Part I of this essay surveyed important federal and provincial developments in Canadian water law and policy from Confederation to the recent past. These activities, relating to both water supply and allocation as well as environmental and drinking water quality, were adopted

within the context of a few key supporting assumptions. These assumptions included an expectation of overall abundance and a widespread disregard for environmental considerations with navigational, hydro-electric power infrastructure and wastewater arrangements as prominent examples.

Many of the decisions taken or institutions previously established remain influential, including the constitutional division of powers, the *Fisheries Act*, the International Joint Commission and the Prairie Provinces Water Board among others discussed above. However as Part II of the paper suggests, gradual shifts in underlying assumptions have begun to condition new initiatives. Those shifting assumptions include acknowledgement that Canada’s available water supplies are not so unlimited as might once have been imagined, an understanding that the importance of water in ecological context can no longer be disregarded, and even recognition that other countries may have an interest in the effectiveness of Canadian water stewardship including efforts to promote conservation and drinking water quality.

Part III illustrates that the incorporation of water within the evolving Canadian formulation of sustainability is underway. There are indications, for example, of more significant efforts to consider the complexities of sustainable water policy such as the integration of surface and groundwater systems and perhaps increasingly to discipline human uses in relation to more realistic expectations encouraged by conservation measures. Economic incentives to promote conservation are moving beyond pilot-testing, although even basic pricing signals are by no means fully utilized. And watersheds offering new planning and management perspectives as well as additional opportunities for participation are more familiar to policy makers than ever before. To put the transition another way, sustainability as a performance standard is gaining recognition, while various conservation initiatives reflect a deeper appreciation of water’s value, particularly within the poorly developed, but promising institutional framework of watersheds. There, more integrated and participatory forms of governance are beginning to appear.