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CANADA'S WATER IN A CONTINENTAL CONTEXT

Frank Quinn

Introduction

It is no real mystery why Canada's population and economy are an order of magnitude smaller than what exists south of its border. So much of our northern environment is beyond the range of comfort, too cold and too barren to support more intensive development. But we do have some compensating values, of which the most prized by Canadians may be our rich heritage of lakes, rivers and wetlands. An economist, thinking in terms of trade, would call it our comparative advantage. But is Canada's freshwater essentially a trade commodity, about to become the latest in a series of natural resource exports which began three centuries ago with fish and fur, and continues today through forests, fuel and minerals? That is an issue which has provoked so much anxiety among Canadians, even as Canada and the United States cooperate routinely in managing their shared boundary waters.

This presentation considers water export proposals between, and the pattern of existing interbasin diversions within, Canada and the United States in the latter half of the 20th century. Neither appears to have much potential for growth, because of a fundamental shift in developed economies from water supply to demand management. But trend is one thing, destiny another. Canadians, and their American neighbors in the Great Lakes basin, continue to pursue legislative protection for their water heritage over the long term.

Resources Availability

Canada is considered, even by its own citizens, to be wealthy in water resources. Media accounts often mistakenly credit this country with a quarter to a half or more of the world's freshwater supply (Maich 2005), reflecting the popular image of Canada as a land of northern ice and snow and of innumerable sparkling lakes stretching to the horizon. The perception of water abundance, or surplus, comes from two sources. First is a failure to distinguish the portion of water which is annually renewable from the total volume in lakes, rivers, glaciers and ground water. The Great Lakes are a prime example, 99 % of their volume being a legacy of the melting of the Pleistocene ice sheets thousands of years ago, and thus not renewable in human time scales. Second is a tendency of our egocentric society to reduce water needs to per capita availability, as though no other forms of life or ecological relations mattered. In per capita terms, Canada has less than 1 % of the world's population and 8 % of the world's renewable water resources. But we also have 7 % of the world's landmass, and in this perspective, a fair

share, not a surplus, of fresh water. In fact, the Canadian and American shares of global renewable fresh water are not much different, at roughly 8 % and 7 %, respectively (Gleick 2006, Table 1, data sec.). That is not out of line, considering that Canada's geographical extent is slightly larger than that of the United States.

The odds are long that it will ever be practicable, in either economic or environmental terms, to redistribute water or people on a continental scale. Canada and the United States will continue to experience natural imbalances in their water supplies from time to time and from place to place. The relative wealth of water in our northern regions, especially Alaska and Canada's three territories, will remain largely untapped, while we face the less glamorous task of reforming the wasteful practices which have made our two countries the most profligate water users in the world. In this respect, we may have more in common than we might want to think.

Water Diversion and Export

Despite four decades of sporadic controversy on this issue without result, a former Alberta premier recently expressed his view that a major push from the United States for Canadian water would emerge within 3 to 5 years (Lougheed 2005). That seems unlikely, for two reasons: (1) Canadians continue overwhelmingly to oppose the very idea of selling our freshwater resources; and (2) Americans seem to have less interest in the issue than ever.

It is true that a few private-sector promoters in each country have done their best, beginning in the 1960s, to make their continental pipedreams come to life, but we shouldn't take them too seriously. Parsons' NAWAPA, Kierans' GRAND Canal and others of this genre are not supported by field investigations, engineering specifications or economic analysis, they are not supported politically by any government in either country, they are basically nothing more than lines on a map (Day and Quinn 1992, ch.2).

What is perhaps more interesting is the pattern of interbasin water diversions that already exists within the two countries (Fig.1). It hasn't changed significantly in the last two decades, suggesting that the era of big dam and diversion construction in North America is effectively over, with the major exception of Quebec. Of special note are the different uses which diversions serve in the two countries: mostly electricity generation in Canada, a non-consumptive use, mostly irrigation and municipal uses in the United States (Quinn 2004). Note also that interbasin diversions take place within provincial, state and national boundaries, not across them. Canadian interbasin diversions, already at least four times greater in volume than those in the United States, are not the first stages of a pipeline leading south of the border. The largest of them concentrate flows for hydroelectric power production, and thus transmit electricity, not water, to market. It is estimated that 97 % of the gross water storage capacity of large dams and about the same percentage of the flow diverted between watersheds is for hydroelectric power production (Table 1). Three projects, the diversions into La Grande River in the James Bay region of Quebec, the Churchill River diversion to the Nelson River in northern Manitoba, and the

Table 1. CANADIAN DAMS AND DIVERSIONS, 2002

Province/ Territory	Large Dams*			Interbasin Diversions**		
	Number of Dams	Gross Storage Capacity, $10^9 m^3$	% of Capacity for Hydropower Generation	Number of Diversions	Mean Annual Flow, m^3s	% of Flow for Hydropower Generation
British Columbia	99	150	99	11	340	99
Alberta	59	7	54	9	71	18
Saskatchewan	44	29	75	5	33	85
Manitoba	41	80	99	7	784	99
Ontario	122	57	88	9	555	94
Quebec	333	470	98	9	1,851	100
New Brunswick	16	2	96	1	2	--
Nova Scotia	37	2	93	6	23	100
P.E.I.	--	--	--	--	--	--
Newfoundland	90	92	100	5	716	100
Yukon	4	<1	100	--	--	--
NWT	4	<1	100	--	--	--
Nunavut	--	--	--	--	--	--
CANADA	850	890	97	62	4,375	98

* Defined by the Canadian Dam Association as those at least 15 metres in height, or 10 metres and meeting other specified conditions. Includes all large dams with the exception of tailings dams.

** Diversions meet two criteria: mean annual diversion rate is not less than 0.5 cubic metres per second; and diverted flow does not return to stream of origin or to parent system within 25 km of point of withdrawal.

Sources: Canadian Dam Association 2003. *Dams in Canada*. Edmonton.
Quinn, Frank. 2004. Interbasin Water Diversions in Canada, A Report to the International Commission on Irrigation and Drainage (ICID). Ottawa.

diversions above Churchill Falls in Labrador (Newfoundland), account for two-thirds of all water diverted in Canada.

A brief reference may suffice for other means of exporting freshwater. Despite repeated efforts by entrepreneurs and brief flirtation with their proposals on the part of coastal provinces, the first ship to transport Canadian water in bulk outside the country has yet to leave port. Alaska, the only jurisdiction on the continent which remains open to bids for shipping freshwater resources in bulk, has yet to make a major sale, either to other parts of the United States or to foreign markets. And the trade in bottled water between Canada and the United States, while sometimes raising justifiable questions in terms of community impacts, is of no more significance internationally than the export of beer or soft drinks (International Joint Commission 2000, sec.3).

Meanwhile, south of our border, there appears to be less interest in importing water than at any time in the past three decades. During that period, Southwestern states have been rebuffed in turn by their better-watered neighbors in the Pacific Northwest, the lower Mississippi, the Missouri and the Great Lakes basin states. Los Angeles uses no more water today than it did in 1985 with a smaller population. Water supplies within the Southwest are not running out, they are being used more efficiently. The many alternatives to water importations, switching the emphasis from water supply to water demand management, are proving to date generally less costly in both economic and environmental terms. Conservation pricing, conjunctive use of ground and surface water, desalination, wastewater treatment and recycling, drip irrigation, voluntary marketing, low-flow appliances, leak reductions: the possibilities keep expanding. With a little pressure from its neighboring states, California finally reached agreement with the US Secretary of the Interior to reduce gradually its overuse of the Colorado River and to support reallocation of huge volumes of the remaining apportionment from the Imperial and Coachella irrigation districts to higher-valued urban uses (Murphy 2003).

According to the US Geological Survey (2004), water use for the country as a whole peaked in 1980 and has not reached that level again since. Canadians used to say that the US should stop wasting the water it has, now the shoe is on the other foot. The nature of this conference in Santa Fe is a good indication of the wider range of options being explored to stretch regional water supplies in the United States, and Canada needs to learn more about them and to improve its own conservation and efficiency practices.

Legislating Protection

If present trends and economic conditions seem to discourage further large-scale, long-distance water redistribution, that is not to suggest that this issue will disappear, that it will not return in changing circumstances to cloud our future, Although both the Canadian and US governments have recently asserted that GATT, WTO and NAFTA have no basis for interfering with the sovereign right of governments to prevent sale of their resources (International Joint Commission 2000, Appendix 8 and 9), Canadians

remain concerned, in particular, about their rights and obligations in the face of international trade agreements. Canada has finally taken steps to improve its defense against bulk water export.

As a result of the controversy caused in 1998 by a Canadian firm proposing to export water in bulk from Lake Superior by ship, the Government of Canada decided it must do something to resolve this longstanding issue on a broader scale and for the longer term. In the following year, it announced a strategy, based on environmental rather than trade grounds (Government of Canada 1999). In essence, major watersheds would become the geographical basis for preventing bulk water "removals." Mindful of provincial primacy in management of natural resources, the federal government proposed that all provincial and territorial governments prohibit, by legislation or regulations, bulk water removals from watersheds within their jurisdictions. Protecting water, its ecological integrity and its use in the source region, within natural rather than political boundaries, was initiated as a defense against bulk removals, whether for use elsewhere in Canada or in other countries, thus avoiding the discrimination that could bring international trade challenges. Laws, regulations or policy are now in place across the country for this purpose, including amendments to the federal International Boundary Waters Treaty Act (2002) to prohibit removal of water in bulk from the Canadian portion of Canada-US boundary waters. Provision is made for overriding the prohibition on bulk water removal in a situation of short-term humanitarian need. Existing interbasin diversions in Canada are "grandfathered" and not subject to reversal. The vulnerability apparent in this approach is that any of the provinces, as resource owners, could opt out at any time to further its own trade interests.

It may seem hypocritical for Canada's senior governments to adopt a strategy of restricting freshwater resources to use within major watersheds, given the record number of interbasin diversions in operation around the country. On the contrary, public unrest has increased with more cases documented of the negative impacts of megaprojects on environmental processes and on those communities, especially in the north, that have been displaced or otherwise disadvantaged. It is what we have learned from this wealth of experience that leads us toward a more cautious and conserving approach today.

Even though Canada has taken action to protect water within its own territory, that doesn't necessarily mean that the United States will not at some point in the future decide to relieve serious water shortages (climate warming?) by taking a larger share of waters along the international boundary, particularly from the Great Lakes, the largest pool of surface water on the continent. In that respect, the Chicago diversion remains a long-term threat. The international boundary does not pass through Lake Michigan; it is therefore the one Great Lake which is tributary to a boundary water, not a boundary water itself, under the Boundary Waters Treaty (1909). Canada has not been without influence, nor have other Great Lakes states, in opposing any increase in diversion volumes already permitted under a US Supreme Court order from Lake Michigan to the Mississippi River. That hasn't stopped the US Government, however, from testing larger diversions in 1956 and from considering tripling volumes in 1988 both during drought periods. With some expansion of the channel near Joliet, Illinois to prevent local flooding, it could be

accomplished easily within US jurisdiction (Fig.2). Fortunately, this issue was addressed in the Annex 2001 non-binding agreement negotiated by the 2 provinces and 8 states of the Great Lakes basin which opted for limiting the diversion to the 91 cubic metres per second defined in the Supreme Court order (Council of Great Lakes Governors 2006). We now await a ratification process which the US Government and those states must pursue in the coming months to form a federal-interstate compact. If limits to the Chicago diversion remain intact, US courts would have to take into account all Annex 2001 provisions, including cumulative impacts, conservation and return flows. If they do not survive the ratification process, however, Canada's only recourse in the event of larger diversions by the United States would be, under Article II of the Boundary Waters Treaty, to claim compensation after the fact in a US court. Given the uncertainty of this untried defense mechanism, the Chicago diversion could still become Canada's Achilles heel.

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