Eau Canada

Eau Canada: The Future of Canada's Water

Edited by Karen Bakker

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UBC Press
The University of British Columbia
2029 West Mall
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604-822-5959 / Fax, 604-822-6083
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Foreword

David Schindler

Canadians feel very strongly about water governance. A 2004 Ipsos-Reid poll conducted on behalf of the Council of Canadians found that 97 percent of Canadians agreed with the statement: "Canada should adopt a comprehensive national water policy that recognizes clean drinking water as a basic human right." A high proportion of Canadians blame politicians for the water crises at Walkerton, Ontario, and North Battleford, Saskatchewan. Therefore, this book should be of widespread interest to Canadians since, in language that is intelligible to the public, it summarizes many of the problems of water governance in Canada.

The libraries of academic institutions contain many papers on important facets of water governance in Canada. They are diffused through a broad literature and written in the professional jargon of scientists, constitutional lawyers, policy analysts, and other professionals. As a result, the public, and even most politicians, is unaware of the increasing problems that our country faces in securing its water supplies for the future. Bakker and her colleagues do a remarkable job of sifting through this diffuse mountain of academic and legal work, summarizing what is relevant to contemporary water governance. One hopes that politicians will read the book, people will demand action, and the frustrating decades of inaction by politicians on national Canadian water policy will end in the very near future.

The Rawson Academy of Aquatic Sciences once attempted a similar synthesis; unfortunately, however, government bulletins are poorly advertised (see M.C. Healey and R.R. Wallace 1987, *Canadian Aquatic Resources Bulletin 215*, Canadian Bulletin of Fisheries and Aquatic Sciences, Ottawa). The academy's book received only limited use by academics and attracted little attention from politicians or the public. It was written in the heady days following the Pearse Federal Inquiry on Water, and most academics hoped the inquiry would result in a strong federal water policy that would form the basis for

international and interprovincial water management, to be enforced by Environment Canada's Inland Waters Directorate. This did not happen. Many of the reasons why are outlined in *Eau Canada*. Today, we still have no strong Canadian federal water policy, and the Inland Waters Directorate has been disbanded. The Rawson Academy of Aquatic Sciences, comprised of a collection of prominent academics interested in translating water research into strong policy, no longer exists, and federal water policies have become increasingly weak. The federal government is largely ignored by the provinces when they make their decisions about water. As a result, throughout the country, we have a mish-mash of water policies that are inconsistent with respect to the precautionary protection of the environment and to protecting the rights of Canadians. Shades of the Balkans!

The threats to Canadian water have changed since the Rawson Academy's summary was written eighteen years ago. At that time, much was made of the threat of large-scale diversions of northern rivers to support water-hungry American developments of the Midwest and Southwest. Fortunately, those threats have faded somewhat, thanks to the increased efficiency of desalinization, some modest conservation initiatives, and a better understanding of the huge costs and enormous social and environmental impacts of such large-scale diversions. Nevertheless, a few misinformed individuals continue to press for such massive engineering feats. Cost seems not to be a factor in other expensive undertakings (such as wars), and there is some danger that, at a time of water scarcity, little consideration might be given to the costs or ecological consequences of massive diversions. At a time when good will between the United States and Canada is at a minimum, some threat to our water clearly remains.

Modern threats to water are smaller but more abundant than were older threats. Examples include legislation to sneak small but numerous aliquots of groundwater from the Great Lakes Basin to US counties that straddle the watershed boundaries, or the consistent exceedance of the amount diverted from the Great Lakes to the Mississippi via the Chicago River – a diversion that was unilaterally approved by the United States before the Boundary Waters Treaty of 1909. There have also been worrisome and unprecedented violations of the Boundary Waters Treaty over the past few years, and Canadians should be aware of these. The diversion of water from North Dakota's Devils Lake into Lake Winnipeg, one of our most productive freshwater fisheries, is one such violation. There is also talk in the US midwest of taking water from

Lake of the Woods to replenish or replace the dwindling, unsustainably used aquifers of the western United States. In all cases, there is no reference to the International Joint Commission (IJC), which has adjudicated cross-border water decisions between the two countries for almost 100 years. Canada is also guilty of IJC violations. Pollutants from smelters in Trail, BC, to US waters, along with the threat of pollution from new Canadian mines in the headwaters of the Flathead River, have Montanans riled. It is time that mechanisms for our transboundary governance of water are reviewed and updated.

Eau Canada should make Canadians aware of the hypocritical nature of Canadian policies with respect to water governance. Diversions that would have created an international political row had they taken place on cross-border waters (Devils Lake being an excellent example) have taken place quietly and without fanfare within Canada. Cases include the combining of many rivers entering James Bay and the diversion of the Churchill River into the Nelson River in Manitoba. Much of the resulting hydroelectric power is sold to the United States. These have been destructive to ecosystems and Aboriginal cultures but are tolerated by Canadians because they occur within our boundaries. More of such projects are planned. We already impound and divert more water than any other country, and there are plans afoot to double the amount.

Canadians should also keep a sharp eye on what is happening to the Athabasca River in northern Alberta as a result of oil sands development to fuel our increasing fleet of gas-guzzlers. As in Quebec and Manitoba, key ecological resources and Aboriginal cultures are clearly threatened, and there is no sign that our federal government will intervene on behalf of Canadians to protect water resources and cultures that are an integral part of our country. As with hydropower, multinational companies, who plan to export most of the oil and gas for profit, are perpetrating much of this massive ecological destruction. Further downstream, it now seems virtually certain that a pipeline will be built in the Mackenzie Valley to transport northern hydrocarbons to southern markets, despite irreparable ecological damage to ecosystems and social systems in northern communities.

Eau Canada also spells out, in clear and concise language, the real facts concerning water abundance in Canada. The glib assurances of water abundance that we frequently hear from the media, politicians, and even environmental groups are lies, unsupported by meteorological or hydrological data. Typically, a square metre of average Canadian terrain receives no more water

from precipitation each year than does the same amount of terrain in many other countries. The apparent abundance of water on the Canadian landscape is partly a function of the large number of depressions that hold water (i.e., lakes) left by retreating glaciers and partly the result of the fact that we are a cold country, so that losses to evaporation and transpiration are low. In other words, while Canada has a large freshwater "bank account," the interest rate is very low. As in finance, it is the interest that we have to use if we want to sustain our water capital. Southern Canada, where 85 percent of Canadians live, is much drier than the US average. Even the enormous Great Lakes have only 1 percent of their massive volume renewed by precipitation and runoff each year. Those who would send our water south, or even transport it by tanker to countries that have lost their water to unsustainable practices, either ignore or do not understand these facts.

As I write this, the Canadian election campaign of 2005-2006 has just finished. It has been bizarre to see debate by those who are supposed to be our leaders limited to issues that are secondary to Canada and Canadians in the overall scheme of things. The Conservative Party has been elected on its promise to ensure that federal politics are cleaned up. The party has declared that the environment is not a major factor in its agenda and has promised to replace Canada's commitment to the Kyoto Accord with a more industry-friendly pace of reductions in carbon emissions. It does not seem to grasp the fact that political scandals are much less important to the future of Canada and Canadians than are freshwater supplies, the ecosystems that sustain them, or many other environmental issues that are critically connected to our accelerating pace of "development." Warning signs of our unsustainable water policies are everywhere: Walkerton, North Battleford, and Kashechewan are examples. So are the prolonged Prairie droughts between 1998 and 2004, and the dwindling quantities of water reaching the Prairies from glaciers and snowpacks assailed by a warming climate. We should be asking political leaders: "What will your policies be on water issues, climate change, and sustainable societies?" Instead, we tolerate weeks of insubstantial nonsense as the basis for making our choices at the polls. It is to be dearly hoped that *Eau Canada* will be the start of a new dialogue between academics, the public, and politicians – a dialogue directed at ensuring that strong and sustainable policies underpin our future treatment of water and other natural resources.

Preface

Eau Canada analyzes aspects of contemporary water management and governance practices in Canada, including decision-making procedures; business models; legal and jurisdictional frameworks; political cultures; water rights regimes; and questions of participation, transparency, and accountability in water management. Many other equally important areas of water management and academic inquiry – such as aquatic science and engineering – are excluded or dealt with only in passing.

Any analysis is an exercise in the drawing of boundaries, and the boundaries for some subjects – particularly environment-related issues – are more porous and artificial than others. Most experts working on water issues – including the majority of contributors to this book – would likely agree that an integrated approach, although difficult, is absolutely necessary, given that water is a multi-purpose resource that is essential for life, transcending jurisdictional and geopolitical boundaries and linking complex social and technical systems.

The relatively narrow focus on water governance and management is justified insofar as many Canadian water experts feel that water governance in Canada is in a state of *crisis* (in the true sense of the word): a turning point in which weaknesses are exposed, challenges are confronted, and opportunities for innovation arise. "Crisis" is an over-used and tired term, but it is appropriate here for two reasons: (1) the potentially dramatic consequences of the systemic weaknesses in contemporary Canadian water governance, and (2) the opportunity that this offers for innovation and renewal in our relationship to water.

This, in turn, lent impetus to the decision to target this book at a general audience rather than at specialists. Reflecting the diversity of stakeholders in Canadian water debates, contributors to this book have been drawn from

universities, think tanks, NGOs, and government. They have written chapters aimed at a similarly diverse audience in the hope that *Eau Canada* will serve to spark debate about the nature, causes of, and solutions to persistent problems in our relationship with water.

Acknowledgments

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Most important, the twenty-seven contributors to this book took time away from busy schedules to craft chapters that seek to speak beyond the confines of disciplinary boundaries; their time, energy, and creativity is much appreciated.

All royalties from *Eau Canada* will be donated to the Canadian branch of the not-for-profit Waterkeeper Alliance, an organization dedicated to grassroots action to prevent water pollution and to enforce water legislation. (For more information on the Waterkeeper Alliance, see http://www.waterkeepers.ca, and Appendix 3 of this volume.)

Abbreviations

AIA	Alberta Institute of Agrologists
BWT	Boundary Waters Treaty
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Agency
CEPA	Canadian Environmental Protection Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CGLG	Council of Great Lakes States Governors
COAG	Council of Australian Governments
CUPE	Canadian Union of Public Employees
CWWA	Canadian Water and Wastewater Association
DDT	dichlorodiphenyltrichloroethane
EAB	Environmental Appeal Board
EAGLE	Effects on Aboriginals in the Great Lakes Environment
EDS	endocrine disrupting substances
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization (United Nations)
FQRSC	Fonds québécois de la recherche sur la société et la culture
GMO	genetically modified organisms
IJC	International Joint Commission
IWRM	Integrated Water Resources Management
KW	kilowatt
KWh	kilowatt hour
lcd	litres per capita per day
MCM	million cubic metres
NAFTA	North American Free Trade Agreement
NAWAPA	North American Water and Power Alliance
NCE	Networks of Centres of Excellence

NGO	Non-governmental organization
NRC	National Research Council
NRTEE	National Round Table on the Environment and Economy
NWRI	National Water Resources Institute
OECD	Organization for Economic Co-operation and Development
P3	public private partnership
P7 (P8)	group of world's poorest 7 (now 8) countries; counterpart to G7 (now 8)
PCB	polychlorinated biphenyls
POGG	peace, order and good government
POP	persistent organic pollutant
SCEE	Standing Committee on the Environment and Sustainable Development
SSRB	South Saskatchewan River Basin
UBCIC	Union of British Columbia Indian Chiefs
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCD	World Commission on Dams
WRDA	Water Resources Development Act
WRI	World Resources Institute

Eau Canada

1
Introduction

Karen Bakker

Canadians' relationship with water is rife with contradictions. We are fiercely protective of our water, yet hugely wasteful with it, using more water per capita than any nation in the world, except the United States (Boyd 2001). Images of pristine water are Canadian icons, yet we are one of the very few developed countries not to have legally enforceable water quality standards (see Appendix 1). Canadians are highly resistant to the notion of exporting water, yet Canada is one of the largest diverters of water in the world for hydropower (Day and Quinn 1992).

These contradictions in our approach to water stem from many sources: a mistaken belief in water's unlimited abundance; an assumption that water resources can be diverted to suit human purposes, with little regard for environmental consequences; our failure to comprehensively address threats to public and environmental health that arise from water contamination, poor environmental monitoring, and a lack of data and enforcement; and an inability to transcend provincial-federal turf wars over resource management. In a recent report on water management by the Senate Standing Committee on Energy, Environment and Natural Resources, the state of water management at the federal level was described as "shocking" (Senate 2005) and "unacceptable," an assessment with which many of the contributors to this volume would agree.

Over the past decade, these contradictions in our approach to water management have become increasingly difficult to sustain, and the "flush-and-forget" mentality that characterized our relationship to water for much of the twentieth century is giving way to increased concern. Canadian news coverage of water issues doubled between 1999 and 2001, and it has remained high since 2001.[1] Well-publicized water contamination incidents in Kashechewan (Ontario), Walkerton (Ontario), and North Battleford (Saskatchewan) have alerted Canadians to public health issues related to water

quality (Laing 2002; O'Connor 2002; Parr 2005; Prudham 2004; Woo and Vicente 2003). Reports on increased threats to water quality and quantity from Environment Canada, the National Water Resources Institute, and the Senate have attracted renewed attention to water issues (NWRI 2001; Senate 2005).

At the local level, many communities are engaging in debates over water management. Droughts and floods in different regions are raising concerns about water supply and flood control infrastructure, and about the possible effects of climate change. Responding to the underfunding of public infrastructure, many cities – including Toronto, Montreal, and Vancouver – have recently debated the involvement of private companies in water supply (Bakker and Cameron 2005). Ongoing attempts to export water from Canada – whether by tanker from BC lakes or directly from the Great Lakes – are also generating heated discussion. In many instances, such as during the recent Great Lakes Annex debate (see Chapters 7 and 8), citizens' coalitions and non-governmental organizations are much more active than in the past; indeed, they are often at the forefront of debates.

The contributors to *Eau Canada* explore these debates, focusing on five themes: water governance; transboundary water management; water privatization; pathways to better water management; and changing water worldviews.

Part 1 – Muddy Waters: How Well Are We Governing Canada's Waters?

At the provincial level, water governance and management in Canada have been undergoing a period of rapid change and intense debate over the past decade. Provincial governments have revised legislation and introduced innovations in water management, such as Alberta's water markets, Quebec's new citizen-run participatory "watershed organizations," and Ontario's requirements for full-cost pricing and accounting for water supply infrastructure. Several provinces, including Manitoba, Ontario, and Quebec, have revamped water quality standards and monitoring. Alberta is dramatically delegating citizen participation in water management (Alberta Environment 2003). Manitoba has created a new Ministry of Water Stewardship (the only ministry devoted to water issues in Canada). Leading not-for-profit organizations (Council of Canadians) and environmental think tanks (Canadian Environmental Law Association, Friends of the Earth, Sierra Legal Defence Fund) have launched high-profile water campaigns, as has the country's largest union (Canadian Union of Public Employees). Growing corporate

interest is reflected in the Conference Board of Canada's new Water Research Forum initiative.

This activity is occurring within the context of what many of the contributors to *Eau Canada* portray as a diminished (and in some instances ineffective) federal government focus on water issues over the past two decades. Noting the absence of federal leadership on water policy, as evidenced by

BOX 1.1

Canadian research on freshwater problems: From "best in the world" to "down the drain"?

David Schindler is one of Canada's top water scientists. In 1991, Schindler was awarded the first Stockholm Water Prize, water science's equivalent to the Nobel Prize. Schindler became well known for his groundbreaking work proving the link between water pollution and acid rain. He has warned repeatedly of a freshwater crisis in Canada, criticizing the cavalier attitude of Canadians to fresh water, the failure to deal with water pollution and to safeguard water quality, and the lack of a national water strategy and under-investment in water research on the part of the federal government. According to Schindler:

> In the mid-1960s, many aquatic scientists, myself included, immigrated to Canada because of new and exciting approaches to water research. Large freshwater laboratories were formed by the federal government ... The Experimental Lakes Area (ELA) was formed, becoming one of the few sites in the world where whole-ecosystem experiments could be done to investigate and solve pollutant and fisheries problems. This foresight caused great excitement in the global water science community: Canadian federal freshwater programs were envied throughout the world ... Many Canadian university and provincial programs also became strong ... Best of all, there was excellent interaction between federal, provincial, and university scientists, who worked together with contagious enthusiasm to develop the most powerful freshwater research teams anywhere in the world ... Unfortunately, these programs have been slowly strangled by a shortage of funds, poor salaries and the lack of replacement of departing staff. Politicians have stated the need to balance federal and provincial budgets as an excuse to reduce spending for environmental research and to decrease the size of the civil service ... It is well known that Canada's funds for research are a much smaller proportion of its national budget than in most First World countries. This must change if we are to adequately protect Canadian resources from degradation. (Schindler 2001, 24-25)

the failure to update the federal government's water policy since the last attempt in 1987 (Environment Canada 1987), some prominent Canadian water scientists have voiced concern about the underfunding of water research and the disbanding, in the 1990s, of federal departments devoted to water resources. They argue that this has dramatically reduced Canadians' capacity to assess the state of, and to safeguard, water resources (Box 1.1). As noted by Rob de Loë and Reid Kreutzwiser (Chapter 5), the ensuing fragmentation of water-related activities was so severe that the federal government had to assemble a "Where's Water" team in the mid-1990s to determine whether or not the federal government was meeting its water-related responsibilities.

One reason for the lack of federal attention stems from the division of constitutional responsibility for water between provinces and territories and the federal government. Fisheries, navigation, and international waters are federal responsibilities, yet water resources and water supply are provincial and territorial responsibilities. Water supply is, in turn, usually municipally managed. The fact that water is managed by multiple orders of government further complicates an already complex debate over how best to meet water quality, environmental protection, and public health goals in an era of public sector fiscal constraints. In the context of strained federal-provincial relations and provincial assertions of sovereignty, some stakeholders do not perceive increased federal involvement in water management to be either appropriate or desirable. Yet, this desire for a limited federal role does not resolve the question of responsibility for pan-Canadian or transboundary water issues.

Another reason for the lack of priority accorded to water issues may be, as aquatic scientist John Sprague explores in Chapter 2, a persistent "myth" of water abundance. Sprague argues that this myth is held by a majority of Canadians, and he illustrates his argument with statements made by Canadian politicians and the media. As Sprague demonstrates, the assumption that Canada is significantly more water-abundant than other nations (or the notion that "Canada is to water as Kuwait is to oil") is simply false. We are not the "Kuwait of water": Canada has under 7 percent of the global renewable water supply, and much of that supply flows north to areas relatively remote from population centres in southern Canada. These arguments are backed up by the findings of a recent report of the Senate Standing Committee on Energy, Resources and the Environment, which notes that:

> As Canadians, we generally don't spend much time thinking about water because we assume that there is plenty of it in this country to which we have ready access. [But] the fact is that certain regions of Canada, notably in the prairies, face important water challenges. Some parts of the prairies are semi-arid. In certain areas water consumption now matches or possibly exceeds what is renewed every year. (Senate 2005, 1)

Nonetheless, the myth of water abundance remains widespread in the Canadian media and public policy debates, and it is one of the reasons why, Sprague argues, both ground and surface water fail to receive the attention they deserve. Environmental lawyer Linda Nowlan, writing on Canada's approach to groundwater management in Chapter 4, agrees. She documents the relative lack of information about Canada's groundwater resources, despite the fact that one in four Canadians relies on groundwater for drinking water (Nowlan 2005).

As geographers Dan Shrubsole and Dianne Draper point out in their survey of water use and management in Canada (Chapter 3), the myth of water abundance is becoming increasingly difficult to sustain at the local level in many communities. Important and increasing stresses on water sources have been documented by Environment Canada. These stresses, in turn, have significant implications for water users. For example, Shrubsole and Draper report that Environment Canada surveys indicate that approximately 25 percent of municipalities experienced water shortages due to increased consumption, drought, or infrastructure constraints between 1994 and 1999 (Environment Canada 2002).

As subsequent chapters in this book point out, recognition of the stresses on water supply has been one trigger for innovation in water governance and management in Canada over the past decade, particularly at the regional, provincial, and municipal levels (see, for example, de Loë, Kreutzwiser, and Neufeld 2005; Kreutzwiser 1998; Plummer et al. 2005; Sproule-Jones 2002). As discussed in Chapters 4 and 5, enforcement and regulation is one area in which Canada has shown little innovation in comparison to other OECD countries. Canada contrasts dramatically to countries such as the United States and the United Kingdom, where large and well-funded environmental protection agencies (distinct from departments of the environment) fulfill key roles such as enforcement and monitoring. In Canada,

these key tasks often fall to independent, often under-resourced NGOs. Drinking water quality, for example, is not nationally enforced or monitored; the federal government merely sets guidelines – which only a few provinces follow in their entirety (see Appendix 1). In some provinces, the best source for comparative data on water quality is an environmental legal not-for-profit organization, the Sierra Legal Defence Fund, which has produced a well-publicized series of "National Sewage Report Cards" and reports on drinking water quality (SLDF 2001, 2004). In contrast, in countries such as the the United Kingdom or United States, water quality reporting is undertaken by well-resourced public sector watchdogs, backed up by legislation; this results in more comprehensive, reliable, and accessible data for consumers than is the case in Canada.

Moreover, several contributors to this book argue that Canada falls behind other OECD countries in accounting for water quantity and quality. In the US, for example, stream flow and hydrology data are publicly available via the Internet. In Canada, however, data are less widely collected, and the number of hydrometric stations has been dramatically reduced in recent years, thus straining information-gathering capacity and raising concerns that network density in some provinces does not meet international standards (Lilley 2004; Scot, Yuzyk, and Whitney 1999). For example, about half of the hydrometric stations in the Okanagan Basin – the driest watershed in Canada – have been discontinued since 1973; this comes at a time when the need for long-term data is critical, given rapid population growth, development pressures, and the effects of climate change in the Okanagan. As indicated by the experience of the Sierra Legal Defence Fund (Box 4.1, Chapter 4), data collection does not automatically imply easy public access. And the limited data that is produced is not widely available or easily accessible.

The contrast between Canada and other developed countries is significant. In the UK, for example, water quality standards are legally enforced, extensively monitored, and the results published annually in an easily accessible form on the Internet site of the national regulator (Drinking Water Inspectorate); in Canada, water quality is not as systematically monitored, nor are data as easily available. For example, due to funding issues, Health Canada does not inspect water on planes to determine its safety (CESD 2005). As a result, the federal government "cannot assure the millions of Canadian travellers that potable water on aircraft is safe" (ibid.), despite its acknowledged responsibility. In comparison, the US government currently has agreements with the majority of airlines transporting the public and found that,

in 2004, water was contaminated with coliform bacteria in about 15 percent of the aircraft tested (ibid.).

Part 2 – Whose Water? Jurisdictional Fragmentation and Transboundary Management

Jurisdictional Fragmentation

Another persistent problem in Canadian water governance, as discussed by lawyers Owen Saunders and Michael Wenig in Chapter 6, is the jurisdictional fragmentation that characterizes water management. Water legislation is a patchwork of provincial and federal laws, with inconsistencies and gaps in important areas of responsibility and oversight. This is not unusual. Water continually crosses political boundaries as it circulates through the hydrological cycle and invariably raises difficult questions of jurisdiction, in part because water is a multiple-use resource, critical for energy, agriculture, tourism, environmental health, and human water supply.

Delegating these responsibilities to different departments and scales of governance may make sense in theory. Yet, many of the contributors to *Eau Canada* argue that our approach to distributing governance between different jurisdictions has reduced Canada's effectiveness in dealing with challenges to water governance. For example, drinking water guidelines are established through a process that involves federal, provincial, and territorial governments on a joint committee (Federal-Provincial-Territorial Committee on Drinking Water [CDW]), which establishes guidelines for Canadian drinking water quality. Canada's Commissioner of the Environment and Sustainable Development (in the Office of the Auditor General) has audited the process the federal government uses to develop these guidelines and found a "significant backlog" (of approximately ten years) in updating them, despite Health Canada's recommendation that they should take no more than two to three years to develop or review (CESD 2005). The Commissioner found that many known contaminants are not even listed in the guidelines because of the time lag in updating them.

As contributors to this volume conclude, the federal government is "floundering" with respect to water policy (Chapter 12), and "our water protection capabilities are adrift" (Chapter 8). The federal government's performance with respect to water policy was strongly criticized in a 2001 report by the federal Commissioner of the Environment and Sustainable Development (2001). The commissioner's report argued that the federal government was

not doing enough to protect the environment of the Great Lakes and St. Lawrence River Basin. It also noted that the federal government lacked a consistent and clear strategy for water policy in Canada, and voiced concern that the Federal Water Policy had not been updated since 1987. These concerns were reiterated by the commissioner's annual report for 2005 (CESD 2005). The Commissioner commented favourably on the renewed federal interest in water but noted that the future of the Federal Water Policy remained "unclear" and "uncertain" (ibid.). The Senate Standing Committee on Energy, the Environment and Natural Resources also criticized the federal government's failure to collect adequate basic data on Canada's water resources, stating that "this information gap is ... unacceptable [and] stems in large part from the Government of Canada's retreat from water management issues and from funding relevant research" (Senate 2005, 5).

In addition to impacting our management of water quality and resources, jurisdicitonal fragmentation affects policies and politics of transboundary water management and exports. Given the potentially significant consequences for the integrity of Canadian waters, this book devotes a chapter to each of these issues.

Water Exports and Transboundary Management

Are water exports to be feared? In the past, Canadian water experts tended to argue that Canadians spent too much time worrying about the possibility of water exports and not enough time worrying about the damage caused by their own diversions for hydroelectricity (Day and Quinn 1992). As geographer Frédéric Lasserre argues in Chapter 7, the ecological effects of water diversions are significant and generally negative. Fears of water exports also sometimes underestimate the extensive cooperative mechanisms that have evolved to deal with waters shared between Canada and the United States. The most important of these is the International Joint Commission (IJC), a binational panel that oversees the Boundary Waters Treaty (the international agreement governing cooperation over shared watercourses between Canada and the United States). As Ralph Pentland and Adéle Hurley point out in Chapter 8, the Boundary Waters Treaty is regarded internationally as a model of bilateral cooperation over shared water resources, although its adequacy and the commitment of both nations to the treaty is increasingly under question. Finally, the fact that water exports to the United States already occur (although in very small volumes) and that the "floodgates" have not opened as a result has been interpreted as providing reassurance that

Canada and its southern neighbour are able to cooperate over shared waters (Boyd 2003).

Yet, in the past two decades, the situation with respect to transboundary waters has undergone significant change. First, the North American Free Trade Agreement (NAFTA) has affected Canadian ability to control domestic water policy and to pass legislation controlling or prohibiting water exports (Boyd 2003). The question of how to deal with Canadian water ignited fierce controversy during NAFTA negotiations in the 1980s. The federal government maintained that Canadian water (except bottled water) was exempt from NAFTA. Opposition leaders and critics called for a clause that would specifically exclude water from NAFTA. Instead, the Canadian, Mexican, and American governments issued a joint statement in 1993 to the effect that water was excluded from NAFTA (DFAIT 1999). Moreover, Canada's NAFTA Implementation Act explicitly states that nothing in NAFTA applies to water in its natural state.[2] Nonetheless, legal experts continue to debate whether NAFTA applies to water in its natural state and, thus, to bulk water exports. The closed nature of NAFTA tribunals and the lack of transparency in the decision-making process have further contributed to ongoing uncertainty over the legal status of water under NAFTA.

Second, in response to lingering domestic concerns over NAFTA and to public opposition to three controversial water export proposals, federal and provincial governments have passed new legislation banning interbasin transfers. In 1998, an Ontario-based company (Nova Corp) applied for a permit to take water from the Great Lakes and export it to Asia. In the same year, a Newfoundland-based company (McCurdy Group) applied for a permit to export bulk water from Newfoundland's Gisborne Lake. Neither proposal went ahead. A year later, a British-Columbia based company (Snow Cap) was granted a licence to provide water for export to a California-based company (Sun Belt); the licence was subsequently revoked, although Sun Belt threatened to contest the decision under NAFTA's provisions for equal treatment (see Box 8.1). Although these proposals have been dropped, new ones regularly appear, such as the proposal by a local real estate developer to abstract and bottle one millions gallons of water per day from Adams Lake (in BC's Okanagan Basin) for export to the Middle East.

Following the public debate engendered by these proposals, and an IJC study calling for a moratorium on bulk water exports (IJC 2000),[3] the federal government amended the Boundary Waters Treaty Act,[4] banning the abstraction of bulk water from boundary waters that fall under the treaty.[5] Yet this

amendment did not address the issue of exports of non-boundary waters, responsibility for which is claimed by both provincial and federal governments (the former responsible for water resources, but the latter responsible for international trade). Accordingly, the federal government also sought to establish a cross-Canada consensus on water exports and encouraged Canadian provinces to introduce legislation to ban or limit the export of bulk water. All Canadian provinces, except New Brunswick, have passed legislation pertaining to water exports and/or water diversions.

However, as discussed by Frédéric Lasserre in Chapter 7, much of this legislation does not explicitly prohibit water exports but, rather, bans out-of-basin water diversions on environmental grounds. Canadian legislators may have relied on the fact that, with a few important exceptions, most of the major watersheds in Canada fall completely within Canadian territory; banning trans-basin diversions thus implicitly prohibits water exports. As Lasserre notes, the legislative protection accorded to water exports is incomplete: it may not provide protection in the case of transboundary watersheds, and it may be vulnerable to challenge under NAFTA, under which any exemptions must be in proportion to the objective being served. Provincial laws that prohibit out-of-basin diversions may be open to dispute as being disproportionate with regard to environmental protection – particularly as Canada already diverts significant amounts of water from one basin to another.

Increasing unilateralism on the part of the United States is a third important change in transboundary management. The recent case of Devils Lake is illustrative of these changes (Box 8.2 and Chapter 8). The export of polluted waters by the state of North Dakota into Manitoba's Red River system, via a pipeline constructed in the summer of 2005, clearly violates Article IV of the Boundary Waters Treaty, which states that "waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other side." After pressure from Manitoba's provincial government, the Canadian government asked Washington to join it in referring the Devils Lake case to the IJC, after failing to respond to an earlier request by the US to refer the matter. At the time of writing, the US government has yet to do this. Reasons include the relative decline in the Canadian-American relationship, the power of North Dakota lobbyists in Washington, the commitment of the current White House administration to "states' rights," and increasing American unilateralism on a number of issues (such as softwood lumber). Devils Lake sets a precedent for unilateral action on transboundary

waters on the part of states and provinces – a situation, as several contributors to this volume argue, to which Canada is ill-equipped to respond.[6]

Why would Canada be ill-equipped to deal with these and other governance challenges? As several contributors to this volume argue, at the heart of Canada's inability to exert control over shared water resources is the ongoing "turf war" between federal and provincial politicians over water resources and the resulting federal timidity in exercising its full jurisdiction over water management issues that are, in fact, federal responsibilities. In the case of the debate over bulk water exports in the late 1990s, for example, David Anderson (then federal environment minister) argued that it was beyond the federal government's "jurisdiction to make decisions about provincial resources" (Boyd 2003, 58), even though provinces had repeatedly referred questions over bulk water exports to the federal government's jurisdiction over international trade. As explored in Chapters 7 and 8, this jurisdictional stalemate was evident during the recent debate over "Annex 2001" proposals for a new governance regime allowing bulk water exports by American states bordering the Great Lakes (CGLG 2001).

Part 3 – Blue Gold: Privatization, Water Rights, and Water Markets

Another controversial debate regarding water governance in Canada in recent years has involved the shift toward market-based institutions in water resources and supply management. Historically, water management in Canada has been closely controlled by provincial, territorial, and federal governments. In Canada, as in most industrialized countries, water supply was mobilized during the twentieth century as a strategic resource to support industrialization, urbanization, and agricultural intensification (Bakker 2004). Canada's approach to water management was state-led and emphasized engineering-intensive hydraulic works as a means of satisfying water demands. This "supply-led" approach was based on a desire to provide sufficient quantities of water, where and when needed, such that economic growth could proceed unconstrained. Given high capital costs and long infrastructure lifetimes, public financing was believed to be critical for the development of water supply and resources. Another justification for state involvement was the "public good" characteristics of water: given that water is a partially non-substitutable resource essential for life, and of critical importance to public health, state involvement was thought to be necessary. Accordingly, Canadian

governments financed, built, and managed hydraulic works and water supply infrastructure throughout the country.

Yet, in the past decade in Canada, as elsewhere, the consensus about the need for and nature of state involvement in water supply has broken down (Gleick 2000). This has occurred for many reasons: costly infrastructure investment needs that have outstripped public financing capacity; declining transfers to municipalities from higher levels of government; changing political views on appropriate roles of states and markets in services provision; and increasing support for water conservation and efficiency initiatives, some of which are thought to be more amenable to market-based rather than to state-based regulation (Water Strategy Expert Panel 2005).

As a result, new experiments with market-based water provision and regulation have emerged in Canada. One set of approaches focuses on "commercializing" water management: managing water in line with what are commonly identified as principles and economic instruments associated with the private sector (see, for example, Renzetti and Dupont 1999). Water pricing is a good example (Cantin, Shrubsole, and Aït-Ouyahia 2005). Over the past decade, many Canadian municipalities have begun or have extended the process of metering residential water supply, which implies charging by volumes consumed. As explored in Chapters 13 and 14, various benefits, both economic and environmental, are cited as reasons for metering, which is generally associated with increased efficiency and a reduction in demand for water (National Round Table 1996).

A second, and more controversial, set of approaches to water governance involves the introduction of private companies and private property rights into water supply management (Bakker 2004; Horbulyk 2005). These market-based approaches can be grouped into four distinct categories (which are often confused in public debate): (1) private sector participation in water supply; (2) commercialization of water management; (3) water markets for "raw," or bulk, water (usually for irrigation purposes); and (4) water rights trading. Private sector participation involves private, usually for-profit corporations in the management (and, more rarely in Canada, ownership) of water and wastewater infrastructure. Commercialization is more widespread and less controversial than privatization: it entails the introduction of commercial principles such as profit-seeking and full-cost pricing into water supply management. As documented by Karen Bakker in Chapter 9, several Canadian municipalities have recently signed contracts with private companies for water supply and sewerage management, although most water

supply systems in Canada remain publicly owned and operated. Many more water supply utilities have commercialized operations, adopting a variety of approaches, including the conversion of municipal utilities into publicly owned for-profit corporations (e.g., in Edmonton), the introduction of metering (e.g., in West Vancouver), and market-based pricing mechanisms (e.g., irrigation water in Alberta). Commercialization has occurred in many Canadian provinces; in some cases, such as Ontario, recent legislation requires such commercial approaches to water management as full-cost pricing. As Bakker argues, private sector involvement in water supply is not a panacea: it does not provide cheap financing or solve water governance problems. Bakker recommends that Canadian municipalities need to improve water governance first before considering private sector involvement, keeping in mind the disadvantages as well as the potential advantages of such involvement (Aït-Ouyahia 2006).

This message is reiterated in the examination of water markets and water rights trading in Chapters 10 and 11. Water markets, as discussed by economist Ted Horbulyk (Chapter 10), are relatively new to Canada. Historically, water rights in Canada's Western provinces were associated with land ownership: a water right "attached" to a piece of land could not be exchanged or sold. In water-scarce agricultural areas, the resulting inflexibility in water use (with under-use of water on some farms and shortages of water on others) led, in the late 1990s, to proposals to create water markets in Alberta. In other jurisdictions, as explained by lawyers Randy Christensen and Anastasia Lintner in Chapter 11, although water markets have not been created, governments are creating new ways for users to exchange or trade water rights. Christensen and Lintner examine Canadian and international examples (including Chile and California) and argue that Canadian water governance is not strong enough to allow for widespread markets or water rights trading. They suggest that potential positive outcomes of market mechanisms would be severely hampered by Canada's fragmented jurisdiction, weak regulatory structures, a lack of basic data on water resources, and poor accountability mechanisms. Canada, in other words, needs to improve water governance before it begins experimenting with some of the potential benefits that some market-based mechanisms might offer.

Part 4 – Waterwise: Pathways to Better Water Management

How could we manage water more wisely? This section of *Eau Canada* documents innovative water governance approaches that are being applied in

Canada and that many water experts argue should form the core of a "new water paradigm" (Gleick 2000). In Chapter 12, lawyers Paul Muldoon and Theresa McClenaghan argue that the provincial-federal "turf wars" – and the resulting stalemate in water policy at the national level – should be addressed through a new governance framework that enables provincial and federal levels of government to work together to streamline and enforce existing water legislation. In Chapter 14, political ecologist Oliver Brandes, natural resources economist David Brooks, and lawyer and environmental activist Michael M'Gonigle make the case for a sustainable approach to water management, an approach based on conservation as part of a broader strategy for maintaining environmental health and preserving ecosystem functions.

This strategy of "ecological governance" begins with emphasizing reductions in water demand (to conserve resources, save money, and reduce environmental impacts), with the long-term goal of "soft path" management. This soft path requires a new form of water governance – one that focuses on sustainability, breaks the link between increasing water consumption and economic growth, and radically changes our water use and disposal practices by focusing on the delivery of *services* rather than water.

As economist Steven Renzetti argues in Chapter 13, a key component of this new approach to water management is water pricing. Pricing, according to Renzetti, should balance four criteria: efficiency, fairness, economic equity, and sustainability. Getting the prices "right" should help to encourage efficient water allocation, improve water quality, provide adequate revenues to water suppliers, and encourage innovation and conservation (although in practice it may not always be possible to balance these goals). However, there are significant barriers to "getting the prices right," and better pricing cannot solve more fundamental questions about governance and sustainability (Brandes et al. 2005). How, then, are we to adjudicate between different goals and strike the right balance? The final section of *Eau Canada* attempts to answer this question.

Part 5 – Water Worldviews: Politics, Culture, and Ethics

The final three chapters turn to questions of new water worldviews and their implications for water management. In Chapter 15, lawyer Ardith Walkem documents the increasing legal recognition that Canadian courts have granted to Aboriginal water rights. This has implications, she argues, well beyond water rights and Aboriginal land claims: there is a strong case for integrating

Aboriginal water management norms and ethics into Canadian resource management practices as a matter of environmental justice. The implications would be far-reaching not only for Aboriginal peoples' water sources and water rights but also for the ethical bases of water management practices in Canada.

Changing our water worldviews is, however, far from an easy task. As political scientist Andrew Biro explores in Chapter 16, our ethical bases for water management practices are deeply rooted in Canadian culture: images of pristine, or "natural," water are central to concepts of Canadian identity, which are often implicitly defined against the "modern hydrologically engineered (nature-dominating, imperialist) society to the south." These characterizations, however, break down upon closer inspection. As geographer Frédéric Lasserre demonstrates in Chapter 7, Canada is a much larger diverter of water than is the United States: in the search for hydropower we have, in fact, dammed and diverted more water per capita than has almost any other nation in the world. Nonetheless, the "myth of water abundance" persists, in part, Biro argues, because of its fit with the Canadian national imaginary: "Northern, vast and open, rugged, wild and, of course, cold and wet" (Chapter 16).

Walkem's and Biro's arguments contain important parallels to the call for a "new water ethic," which is articulated by geographers Bruce Mitchell and Cushla Matthews and political scientist Bob Gibson in Chapter 17. In this final chapter of the book, the authors survey emerging approaches to water management in Canada and internationally, and they note that several new (and sometimes controversial) principles and goals are increasingly being advocated (and, in some cases, adopted) around the world. These include ecosystem integrity, source protection, user participation, efficiency and conservation, precautionary management, and legal rights – for both humans and the environment. As the authors point out, these approaches are not always consistent, nor are they always equally applicable. Rather, they point to a new underlying approach to water governance and management that acknowledges the limits of the conventional approach (i.e., hierarchal management) and emphasizes the need for dialogue regarding how we govern not only our relationships with one another but also with the ecologies within which we live. In other words, we need to move away from the "environmental management" of resources and toward the "ecological governance" of human-water relationships, managing *ourselves* as well as the environment.

The Focus of *Eau Canada*

This book focuses on two aspects of our relationship with water: water governance and water management. The difference between the two is subtle, but important. Simply put, "water governance" refers to the decision-making process we follow, whereas "water management" refers to the operational approaches we adopt. Governance refers to how we make decisions and who gets to decide; management refers to the models, principles, and information we use to make those decisions. Obviously, the two are interrelated; however, management is often the focus of debate, whereas governance is often overlooked.

The premise of this book is that Canadian water governance and management are at a crossroads. There is increasing recognition of systemic weaknesses in our approach to water governance, and increased debate regarding necessary reforms to our water management models. This has, in turn, lent new urgency to calls to reform our approach to governance and has also led to a period of fascinating experimentation with new approaches to management.

Eau Canada analyzes some of these weaknesses, challenges, and innovations. Specifically, the book documents recent changes in water governance and management in Canada; analyzes current challenges in Canadian water governance; and explores the different solutions being advocated by different Canadian water experts. This focus will, of necessity, exclude (or acknowledge only in passing) equally important debates in related fields, such as aquatic science and engineering. This is unfortunate insofar as most experts working on water issues – including the majority of contributors to this book – would likely agree that an integrated approach, although difficult, is absolutely necessary given that water is a multipurpose resource that is essential for life, transcending jurisdictional and geopolitical boundaries and linking complex social and technical systems. Accordingly, an appendix with suggestions for further reading has been included (see Appendix 2).

Significant changes are going to be made to water governance and management in Canada over the next decade. One of the premises of this book is that informed public input is essential to good policy outcomes. Accordingly, the goal of this book is to introduce these issues to the broader Canadian public in the hope that people will continue to engage with, and build upon, the ideas and debates presented here. Our water is too important to do otherwise.

NOTES

1 A search of the Canadian Business and Current Affairs (CBCA) database was conducted on 30 August 2005. CBCA indexes articles published in and about Canada, taken from more than 1,500 popular and scholarly publications, including newspapers, magazines, and academic journals. News coverage of the keyword "water supply" was surveyed for the period 1987-2005.

2 North American Free Trade Implementation Act, S.C. 1993, c. 44, s. 7. The relevant clause states that nothing in the act (except Article 302) applies to water, where water is defined as natural surface and ground water in liquid, gaseous, or solid state, but does not include water packaged as a beverage or in tanks. Article 302 refers to the progressive elimination of tariffs (customs duties) between NAFTA signatories.

3 The IJC report stated that Canada and the United States "should not permit any new proposal for removal of water from the Great Lakes Basin to proceed unless the proponent can demonstrate that the removal not endanger the integrity of the ecosystem."

4 Bill C-15, An Act to Amend the International Boundary Treaty Act, S.C. 2001, 40.

5 Bill C-15 specifically "(a) prohibits the bulk removal of boundary waters from the water basins in which they are located; (b) requires persons to obtain licences from the Minister of Foreign Affairs for water-related projects in boundary or transboundary waters that would affect the natural level or flow of waters on the United States side of the border; and (c) provides clear sanctions and penalties for violation."

6 The proposed North Dakota Garrison Diversion (also known as the Red River Supply Project) is an example. Amendments by the US Congress to the Garrison Reformulation Act in 2000 removed the previous requirement for consultations with Canada, strongly opposed by the Manitoba and Canadian governments (Manitoba Water Stewardship 2006).

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PART 1

Muddy Waters: How Well Are We Governing Canada's Waters?

DALE CUMMINGS/ARTIZANS.COM

Canada has just over 6 percent of global annual renewable water supply. Despite this, rumours persist that it is water-rich.