CHANGING THE FLOW:
A BLUEPRINT FOR FEDERAL ACTION ON FRESHWATER

Gordon Water Group
of Concerned Scientists and Citizens

Acknowledgements

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FOREWORD

Who Are We?

The Gordon Water Group of Concerned Scientists and Citizens is a group of researchers, experts, and citizens who have come together out of deep concern for Canada's escalating water crisis. We are all linked by our connections to the Walter and Duncan Gordon Foundation and were brought together through the leadership of Sierra Club of Canada.

We are scientists, lawyers, policy experts and former senior government policy advisors who represent environmental organizations, university research centres, policy consultancies, an indigenous centre and a not-for-profit foundation. As a group, we firmly believe that today's water challenges, and those that lie ahead, can be overcome with a commitment to good water governance, comprehensive policy and planning, and active community participation.

We, like many others, recognize the need for strong federal action to help strengthen our national capacity and respond to the challenges that face us. Through our expertise and experience, we know that there is no time to waste on this critical issue. We hope that this blueprint, which presents a clear direction for federal action and renewed national capacity, will guide our federal government in taking the priority actions that are urgently required.

Why the Gordon Group?

Walter Gordon, co-founder of the Walter and Duncan Gordon Foundation, was widely respected for his commitment to public service and his wide-ranging interest in Canadian public policy. As a Member of Parliament from 1962 to 1968, he served in influential Cabinet posts, including as Minister of Finance and as President of the Privy Council Office. In the 1970s he inspired the formation of the Committee for an Independent Canada, a citizens' group dedicated to the promotion of Canadian economic and cultural independence.

Since its inception in 1965, the Foundation has supported innovation and leadership in public policy through public discussion and the development of new ideas. This focus—a direct result of Walter Gordon's legacy—permeates its Freshwater Resources Protection Programme, which was inaugurated formally in 2003.

Walter Gordon served as an inspiration for a generation of Canadian nationalists and is still remembered for his unwavering defence of Canada's economic independence and sovereignty. Thus, it is particularly fitting that this group of professionals, expert in water-related issues and associated with one of the core programs of the Foundation—indeed one of the most critical issues of Canadian sovereignty—has chosen to organize under the name of Gordon.

THE GORDON WATER GROUP

Timothy J. Morris (Sierra Club of Canada) Tim is National Water Campaigner at Sierra Club of Canada. He is the recipient of a Water Policy Fellowship from the Walter and Duncan Gordon Foundation and has worked on groundwater policy with the Canadian Institute for Environmental Law and Policy. He has a Master of Laws from the University of British Columbia and is completing a PhD on adaptation to climate change impacts on water.

David R. Boyd (Trudeau Scholar, UBC & POLIS Project on Ecological Governance, UVIC) David is one of Canada's leading environmental lawyers, a Trudeau Scholar, an adjunct professor at Simon Fraser University, and a Senior Associate with the University of Victoria's POLIS Project on Ecological Governance. He is the author of *Sustainability Within a Generation: A New Vision for Canada, Unnatural Law: Rethinking Canadian Environmental Law and Policy,* and *Canada vs. The OECD: An Environmental Comparison.*

Oliver M. Brandes (POLIS Project on Ecological Governance, UVIC) Oliver leads the Water Sustainability Project at the University of Victoria's POLIS Project on Ecological Governance. With a background in law, economics and ecological restoration, he focuses on the institutional and legal reform aspects of sustainable water management and provides advice to all levels of government and various non-government organizations. Oliver has authored or co-authored numerous chapters, articles and reports on water sustainability including *At a Watershed: Ecological Governance and Sustainable Water Management in Canada.*

James P. Bruce (Soil & Water Conservation Society) Jim is Canadian Policy Representative for the Soil and Water Conservation Society and serves as a consultant on climate change adaptation, water management, and natural disaster mitigation. He was first Director of the Canada Centre for Inland Waters, Burlington and worked for 8 years as an Assistant Deputy Minister for Environmental Management and Atmospheric Environment. From 1986 to 1989, he was Director of Technical Cooperation and Acting Deputy Secretary-General of the World Meteorological Organization. He is an Officer of the Order of Canada, and a Fellow of the Royal Society of Canada. He has been awarded Honorary Doctorates from the University of Waterloo and McMaster University and the Massey Medal of the Canadian Geographical Society.

Marc Hudon (Nature Québec) Marc is Director of the St. Lawrence River/Great Lakes program at Nature Québec and President of the Priority Intervention Zone Committee (Comité ZIP Saguenay) on the Saguenay river. He is also President of the Quebec Regional Advisory Council on Marine Oil Spills and a member of stakeholder committees relating to water and other environmental issues. Marc retired from the Canadian Armed Forces in 1994, where he was active in the environmental sector for 21 years, working on, among other things, hazardous material safety, contaminated soils, and water and wastewater treatment plants. He was awarded the Commemorative Medal for the 125th Anniversary of Confederation in recognition of the significant contribution he has made to his fellow citizens, and to Canada.

Brenda Lucas (Walter & Duncan Gordon Foundation) Brenda developed and manages the Gordon Foundation's Freshwater Resources Protection Programme, a national program that supports projects to strengthen water policy in Canada. She was responsible for a major project by the Foundation on groundwater, and for creating its Water Policy Fellowship program. Before joining the Foundation she worked on environmental policy and studied fish ecology. She has a master's degree in biology from Queen's University.

Tony Maas (WWF-Canada) Tony is Senior Water Policy Advisor with WWF-Canada. He has been involved in water management issues for over a decade, with experiences ranging from technology development to public policy. While working with the Water Sustainability Project at the University of Victoria's POLIS Project on Ecological Governance, he authored a number of reports on Canadian water policy and provided strategic policy advice to various levels of government and non-government organizations. He is completing his master's degree in Environmental Studies at the University of Waterloo where his research focuses on governance for sustainable water use.

Linda Nowlan (Program on Water Governance, UBC) Linda is an environmental lawyer, with over twenty years experience in the private, government, intergovernmental, nongovernmental and philanthropic sectors. She is currently Faculty Research Associate at the Program on Water Governance at the University of British Columbia, and previously was the Executive Director of West Coast Environmental Law. She is a member of the Canadian Council of Academies' Expert Panel on Groundwater and has also served on the BC Independent Drinking Water Review Panel, the Vancouver Foundation's Environment Committee and the Board of Directors of Smart Growth BC. She is the author of numerous reports, including *Buried Treasure: Groundwater Permitting and Pricing in Canada*, and *The Legal Regime for Arctic Environmental Protection*.

Ralph Pentland (Canadian Water Issues Council and Ralbet Enterprises Inc.) Ralph is Acting Chair of the Canadian Water Issues Council, and President of Ralbet Enterprises Inc., where he has been active in consulting on a variety of water and environmental policy issues. From 1978 to 1991, he was Director of Water Planning and Management in the Canadian Department of the Environment. In that capacity, he was responsible for overseeing numerous Canada-U.S. and Federal-Provincial agreements and arrangements, and was the prime author of the Federal Water Policy that was tabled in Parliament in 1987. He has co-chaired five International Joint Commission Boards, and has served as an environmental consultant in numerous countries.

Merrell-Ann Phare (Centre for Indigenous Environmental Resources) Merrell-Ann is Executive Director and Legal Counsel to the Centre for Indigenous Environmental Resources. She has engaged in research and policy assessment regarding Aboriginal water, environmental and other rights, climate change, environmental assessment, and sustainable development. She holds economics and law degrees from the University of Manitoba and serves on numerous advisory committees and consultation bodies, including the Joint Public Advisory Committee of the NAFTA Commission for Environmental Cooperation, and Regulatory Advisory Committee of the Canadian Environmental Assessment Agency.

Our Collective Principles

As a group, we are united by the following principles that we believe form the foundation for sustainable water management in Canada:

A Conservation Ethic

In contrast to the traditional 'hard' approach that seeks to control or manipulate natural systems, we should satisfy human needs for water in a way that respects and protects our environment. This means that the water management of the future will need to be 'softer' than in the past and will rely less on increasing the water supply and more on reducing our water demand. Reliance on large infrastructure, such as the big pipes and mega-dams that dislocate river systems, will be replaced with non-structural solutions such as planning, education and economic instruments.

A Citizen-Centred Vision

The forces of globalism are increasingly overwhelming the rights of ordinary citizens and the public commons. In response, we must recognize that all Canadians have the right to safe, clean water for fulfilling basic personal and domestic needs, and that it is the duty of all governments to protect and preserve water resources for the use and enjoyment of the entire population, not just the privileged. Where this duty is not being met, Canadian citizens should have the right to insist on the full consideration of the public interest through effective mechanisms, such as those that exist in other countries under the doctrine of 'public trust.'[1]

Thinking Like a Watershed

Because watershed boundaries seldom coincide with political boundaries, we need to take better account of watersheds in our decision-making. Watershed-based management requires an appreciation of the complex interactions that occur between the natural hydrological system and human activities. Activities such as water withdrawal, urban development, commercial and agricultural operations all impact the quantity and quality of both surface and groundwater. The complexity of these interactions means that our future management approaches need to be more integrated, precautionary and adaptive than they have tended to be in the past.

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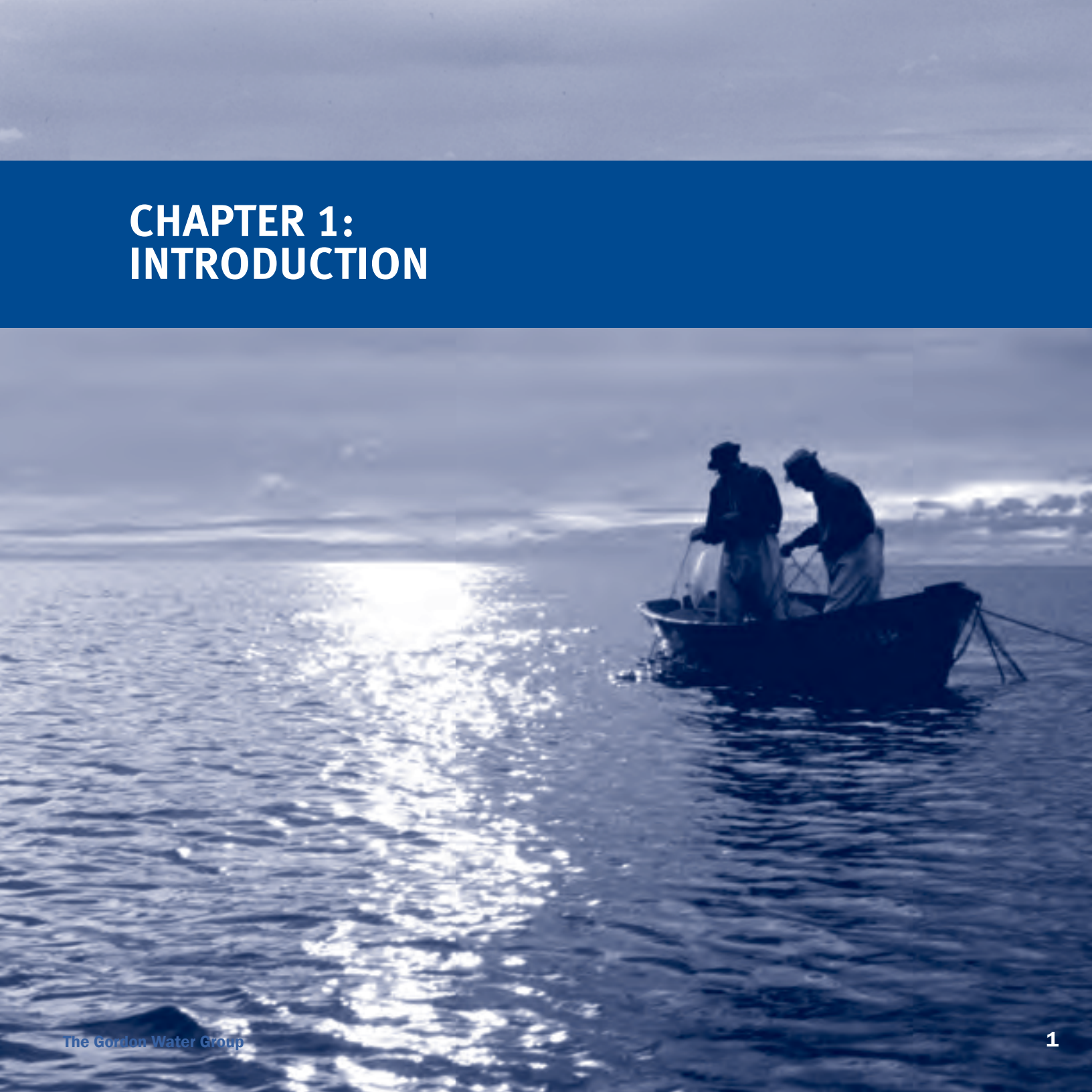
CHAPTER 1: INTRODUCTION



CHAPTER 1: INTRODUCTION

Changing the Flow: A Blueprint for Federal Action on Freshwater builds on mounting calls from a diverse range of groups and sectors for renewed federal action on water. It establishes what we believe is a compelling case for urgent actions to be undertaken by our federal government, and provides clear and concise direction through 25 recommended actions organized around seven priority areas:

- **Enhancing National Capacity for Freshwater Protection**
- **Responding to the Impacts of Climate Change and Energy Production**
- **Securing Safe Drinking Water for All Canadians**
- **Protecting Aquatic Ecosystems and Aboriginal Water Rights**
- **Promoting a Culture of Water Conservation**
- **Preventing Interjurisdictional Conflicts and Bulk Water Exports**
- **Developing World Class Water Science**

This blueprint is directed at federal decision-makers and influential policy advisors. Copies of this blueprint have been distributed to every federal Member of Parliament, all federal Senators, and key decision-makers in provincial, territorial and Aboriginal governments.

It is available at **www.gordonwatergroup.ca**. In addition to informing government actions, it is hoped that this blueprint will significantly contribute to the public dialogue over how we can better protect our precious water resources, now and into the future.

CHAPTER 2:
FACING A NEW WATER REALITY

CHAPTER 2:
FACING A NEW WATER REALITY

Many of the problems that affected our freshwater resources in the past continue to plague us and are even intensifying in some areas. The failure to address these problems shows the need for radical improvements in the governance of our freshwater legacy. This is especially true today since emerging threats point to a new freshwater reality on the horizon. Despite the persistent Canadian myth that our freshwater resources are abundant, we must now face the very real potential that regions throughout Canada, especially in the western provinces, may experience severe water scarcity. Today, the stakes of mismanagement and inaction are much higher than ever before.

Old Problems Have Not Been Addressed, We Are Still...

Failing to ensure all Canadians have access to safe drinking water. Most Canadians turn on the tap and have immediate access to clean drinking water. This is not the case

for First Nations; they have never received the support required to ensure their drinking water is the same quality as the rest of the country[2] and some still do not have access to running water.[3] Non-reserve communities in rural or remote areas are also being left behind. As an example, a number of Newfoundland outports lack access to clean drinking water, a situation one Canadian Senator has described as "scandalous."[4] Further evidence of inequity in access to safe drinking water is the unacceptable number of Canadians who must boil their water before consumption. According to a report provided to the Canadian Senate by Health Canada, there were 1,174 boil water advisories in place in December 2006[5] —a staggering number in a developed nation.

Using too much water. Canadians are among the highest municipal water users in the world. The average total municipal water consumption—industrial, commercial, institutional and unaccounted water—is 622 litres per capita per day.[6] This is 2 to 4 times the average in European countries that have comparable living standards.[7] Although per capita water use appears to be leveling off after rapid increases through the 1980s, total municipal and residential water use continues to climb. Water use increased by 6% from 1991 to 1999—with residential water use increasing by 21%.[8] As a result, communities are now reaching the limits of their local water supplies and the capacity of their current infrastructure. Between 1994 and 1999, one in four municipalities reported water shortages due to increased consumption, drought, or infrastructure constraints.[9] Continued urbanization, population growth, and a changing climate will further exacerbate these shortages and increase the pressures currently being placed on aquifers and riparian ecosystems as a result of excessive water use.[10]

Flushing untreated waste into lakes and rivers. In the Great Lakes-St. Lawrence river region, cities in both Ontario and Quebec continue to release raw sewage into lakes and rivers, closing

What the Experts Say

When it comes to the safety of drinking water, residents in First Nations communities do not benefit from a level of protection comparable to that of people who live off reserves.
Commissioner of the Environment and Sustainable Development (2005) [i]

While Canada's high water use is of significant concern, the fact that it continues to rise is of greater concern. Over the past 20 years, water use in Canada has increased by 25%—in contrast with many other developed nations, including the United States where overall water use has decreased.
Brandes et al. (2005) [ii]

Unfortunately the antiquated sewer systems found in most Great Lakes cities continue to regularly release huge quantities of partially treated or untreated sewage directly into the environment through spills, bypasses and combined sewer outfalls.
Sierra Legal Defence Fund (2006) [iii]

What the Experts Say

The Pacific salmon fisheries are in trouble. Catches have declined overall but the commercial catch has plummeted. The long-term sustainability of fisheries is at risk.

Office of the Auditor General (1999)[iv]

Given the number of large dams currently under construction and proposals for further expansion, for example in northern Quebec, Manitoba, and the Northwest Territories, it is truly debatable whether Canada has yet passed its major period of large dam building.

Prowse, Wrona and Power (2004)[v]

[W]hile some experts claim that there are no markets or that shipping water is too expensive, these assertions are ill-conceived. Assertions that a given use of natural resources is not economical are frequently proven wrong. Bulk water exports are in fact economically viable; Korea and Taiwan both import water via tanker.

David Boyd (2004)[vi]

beaches and contaminating the ecosystem with a "foul cocktail" of waste, pathogens and toxic chemicals.[11] In Manitoba, the same type of eutrophication that led to the declaration that Lake Erie was dying in the 1970s[12] is now sucking the life from large portions of Lake Winnipeg, Canada's fifth largest freshwater lake. In the summer of 2006, nutrient runoff from animal waste, fertilizer use and urban growth caused a 6,000-square-kilometre blue-green algae bloom to appear in the lake, suffocating the existing aquatic ecosystem.[13]

Destroying aquatic habitats and poisoning fish. Freshwater fish populations have been negatively affected by contaminated waters, excessive water withdrawals, and disruption from dams and diversions. Some of the worst declines have been experienced by the salmon fisheries of

British Columbia, which have been decimated by logging, mining, urbanization and hydropower development.[14] B.C. and the Yukon have already lost at least 142 salmon runs, and 624 are on the brink of disappearing.[15] Meanwhile, residents in the Great Lakes-St. Lawrence river region are warned not to eat certain species of fish. The increasing number of fish consumption advisories has contributed to the claim that contamination levels of fish in Lake Huron and Lake Ontario have become "disturbingly more severe."[16]

Altering river systems with dams and diversions. During the last century, Canada constructed 849 large dams, the majority intended for hydroelectric production,[17] and which frequently involved large-scale diversions from one river basin to another.[18] In fact, Canada diverts more water than any other country on Earth with about 97% of the volumes diverted for power generation.[19] While hydropower development is a cleaner source of energy than burning fossil fuels, dams

can transform river ecosystems through changes to water levels, sedimentation, water chemistry and temperature, and associated diversions can drastically reduce natural flows in diverted rivers. Impacts include aquatic habitat destruction, the prevention of natural fish migration, loss of recreational uses, and the disruption or displacement of local communities, particularly First Nations.[20] Although construction has slowed, dams and diversion schemes continue to be built in Canada. Quebec is particularly aggressive in its pursuit of increased hydroelectric generation, which it views as an effective means to boost provincial revenues through energy export and to strengthen its commitment to renewable energy.[21]

Leaving the door open to bulk water exports. Concerns over the sale and export of Canadian water to other countries have

First Nations and Freshwater

Inequities for First Nations are not confined to drinking water. Healthy rivers and lakes are a cultural and spiritual necessity for these communities: "The lives of indigenous peoples are intricately tied to the land and to the waters. As those who live closest to the land and rely most heavily upon it, indigenous peoples strongly feel the effects of water depletion, pollution, or other changes. Water is the lifeblood of the land and of the indigenous peoples and cultures that rely upon it and its waters."[27]

"I live in Grassy Narrows, and if I want to have a baby that is not deformed, I must leave the reservation and cleanse my womb for three years to ensure that my baby is not deformed."[34]

Yet it is First Nations that are most frequently located in areas affected by industrial pollution, flooding for hydropower generation, and ecosystem destruction. For example, Aamjiwnaang First Nation is situated in the middle of Canada's largest concentration of petrochemical plants. It is located near Sarnia on the St. Clair River in an area known as Chemical Valley and is surrounded by several large petrochemical, polymer and chemical industrial plants.[28] To educate outsiders, it now offers a 'toxic tour' in which community members show visitors a "Dickensian juxtaposition of massive petrochemical facilities and rows of modest aboriginal family homes,"[29] and reveal that a scientific study has confirmed that the rate of male births has been declining continuously since the 1990s.[30] Chemical pollution in the river that flows beside the community is a toxic soup known to affect the reproductive systems of fish and wildlife.[31] The community is certain that its health and reproductive problems are related to the pollution emitted into the water and air by surrounding industry.[32]

Sadly, this is not an unusual story for First Nations. In the 1960s, pollution from an upstream paper mill caused record high mercury levels in fish, devastating two northern Ontario First Nations, Grassy Narrows and White Dog. In addition to causing health problems, the poisoned fish resulted in the loss of traditional food and harvesting, livelihoods based on commercial fishing and fishing guide work, and an associated loss of self-esteem within family circles. These communities have since endured years of alcoholism, suicide, and despair.[33]

What the Experts Say

We predict that in the near future climate warming, via its effects on glaciers, snowpacks, and evaporation, will combine with cyclic drought and rapidly increasing human activity in the [Western Prairie Provinces] to cause a crisis in water quantity and quality with far-reaching implications.

Schindler and Donahue (2006)[vii]

been prevalent since the 1960s when proposals such as the NAWAPA (North American Water and Power Alliance) plan and the GRAND (Great Recycling and Northern Development) canal scheme sought to re-engineer the natural hydrology of North America.[22] Today, despite popular opposition,[23] the threat of water exports is still alive. In 1998, the Ontario Government issued a permit for the sale of water to Asia in supertankers, and Newfoundland provided initial approval for a proposal to ship water to the Middle East.[24] Fortunately, both were later revoked due to public pressure, but further proposals seem inevitable. Most recently, the idea of exporting Canadian freshwater was raised by an influential U.S. think tank that will submit recommendations to American, Canadian and Mexican governments as part of ongoing discussions on continental integration.[25] So far, the Canadian government has avoided enacting a comprehensive federal law banning bulk exports because of fears it would violate the North American Free Trade Agreement. The possibility of export therefore remains open.[26]

And Emerging Threats Could be Devastating

A new climate will dry up rivers and lakes. Impacts of future climate warming are likely to be particularly profound in the western Prairie provinces, which have already recorded a warming trend of 1-4°C in the past century, mostly in the last thirty years.[35] Between 1998 and 2004, this warming contributed to drought that was more severe than during the so-called Dirty Thirties. Scientists have also observed a 30% decline in summer flows of the Athabasca River since 1970.[36] As well, the glaciers and snowpacks that serve as water towers for the prairies are retreating.[37] Even without human-induced climate change, natural climate cycles indicate reduced water availability in the future. Droughts of far longer duration than those experienced in the 20th century have occurred

in the past and are likely to occur again.[38] Projections also point to lower water levels in the Great Lakes[39] —Lake Superior declined to record low levels in August and September 2007[40] —and larger and more frequent floods across the nation.[41] In 1997, the "flood of the century" occurred near Winnipeg, Manitoba.[42] In the future, a flood of this magnitude could become more commonplace, and might be called the "flood of the decade."

Groundwater mining may have irremediable impacts. Groundwater is already a source of drinking water in many regions, especially rural communities. It is essential for resource extraction and is exploited in varying degrees across the country for agricultural and industrial production.[43] In a new climate, and with a growing population, groundwater resources will be more aggressively tapped to compensate for a reduction in surface water availability.[44] Sadly, the current knowledge of our aquifers has been described as "pitiful,"[45] meaning their use could lead to excessive depletion with unknown consequences for freshwater ecosystems and future generations.[46] Groundwater is a critical form of natural water storage, and inflow to rivers and lakes may be the only source of water during times of drought.[47] Therefore, unsustainable use of groundwater will exacerbate the severity of water scarcity and increase the risk of the type of environmental catastrophe that has occurred in the western United States.[48]

Energy production could destroy watercourses. The energy industry is the single largest user of surface water in Canada[49] and energy demands continue to rise as a result of population growth and exports to foreign markets. Canada is actually a net exporter of energy, selling over half the energy we produce to other countries.[50] The most rapidly expanding areas of energy production are the oil sands in Alberta. To meet growing demand in the U.S. and new Asian markets, the National Energy Board predicts that oil sands production will triple by 2015.[51] Yet little consideration has been given to the fact that up to four barrels of water are needed for every barrel of oil produced.[52] After use, most of this water is so contaminated that it is retained in enormous toxic tailings ponds and only 10% is returned to the Athabasca River, the flows from which are already declining due to climate change.[53] Current production is already having impacts on downstream ecosystems and First Nations that rely on the river for fishing and hunting.[54] The export of oil may therefore be just as damaging to our watercourses as if we were exporting the water itself.

What the Experts Say

Groundwater remains a relatively invisible topic in Canada. As signs of stress from increased withdrawals and climate change in groundwater ecosystems surface, we need to pay more attention to this "buried treasure". Unlimited or minimally regulated pumping is a recipe for disaster in the more arid parts of the country.

Linda Nowlan (2007)[viii]

By 2015, the Canadian Association of Petroleum Producers predicts that oil sands production may total as much as three million barrels a day. At that point it will be too late to address the impacts of rapid energy development on water scarcity or to responsibly consider options.

Davidson and Hurley (2007)[ix]

What the Experts Say

[A] near-revolution will be required to move away from the current regulatory approach, which is heavily based on proof of specified, clear-cut kinds of harm... Developing a regulatory policy that focuses on subtle damage and deals with such things as the protection of fetuses from a huge range of substances that affect behaviour, intelligence, and long term reproductive health will be challenging, to say the least.

Canadian Institute for Environmental Law and Policy (2006)[x]

According to scientists' best estimates, a new aquatic alien invasive species finds its way into the Great Lakes system about every eight months. The impact of introduced species already in the system, from the sea lamprey to the zebra mussel, serve as harbingers of the economic and environmental costs to come if this crucial threat is not controlled.

International Joint Commission (2004)[xi]

New pollutants threaten national health. Scientists are becoming increasingly concerned by the presence of pharmaceuticals and personal care products (PPCPs) in water. PPCPs include birth control pills, soaps, sprays, and antibiotics. Concerns relate to their potential to produce drug-resistant pathogens, and their impacts on reproductive systems (endocrine disruption).[55] PPCPs find their way into water bodies via unused prescriptions and human excretions in municipal wastewater, via animal waste and fertilizers in agricultural runoff, and via aquaculture operations.[56] Some are not removed by traditional sewage treatment, and traces have been found in municipal drinking water.[57] Currently, impacts on human health are relatively unknown, although disturbing effects have occurred in aquatic species, such as the feminization of male fish.[58] Compared to Europe and the U.S., Canada has carried out minimal research and has conducted only one major sampling program for PPCPs in the environment.[59]

Invasive species could overwhelm native fisheries. In Lake Victoria, Africa, an invasive fish species known as the Nile perch has literally annihilated the native, and once diverse, fish population.[60] Only a weak electric barrier prevents a similarly destructive species, known as the Asian carp, from entering the Great Lakes via the Chicago Sanitary and Ship Canal.[61] In addition, ships continue to empty ballast water into the Great Lakes, releasing exotic species such as the zebra mussel. Most recently, a virus known as VHS, which kills fish by causing hemorrhaging, was introduced and has been gradually spreading through the lakes.[62] In Manitoba, the threat of invasive species to the commercial fishery in Lake Winnipeg, worth an annual $15 million, is a cause of significant concern and the primary reason for opposition to North Dakota's Garrison Diversion and Devils Lake Outlet projects.[63] In June 2007, North Dakota proceeded to open the Devils Lake outlet; this occurred despite the fact that it had not installed an advanced filter, as was required in an agreement with Manitoba and the Government of Canada.[64]

The Canadian Myth of Freshwater Abundance

As a nation, we have long taken for granted the apparent abundance of freshwater within our borders.[66] Canada is frequently said to possess 20% of the world's water but in terms of renewable supply—a more relevant figure—we actually have only 6.5% of the world's supply, much less than Brazil and Russia and about the same as the U.S.[67] And with 60% of our freshwater flowing north to the Arctic and 85% of Canadians living in a narrow band along our southern border,[68] less than half of Canada's reliable flow of freshwater is actually available for use by most Canadians. In reality, we are much drier than many of us would like to believe. Large parts of Canada, such as the Prairies and the Okanagan Valley in B.C., are semi-arid. Lakes and aquifers that we treat as bottomless reservoirs renew at an extremely slow rate so that, in many cases, we are actually draining them for generations to come.[69]

"The misconception surrounding water supply has deep implications for government decisions, as a number of political representatives have made statements indicating that they buy into the notion of mythical abundance. A misplaced belief that Canada has an excess of water will likely lead to decisions that will be detrimental to the country throughout future decades."[65]

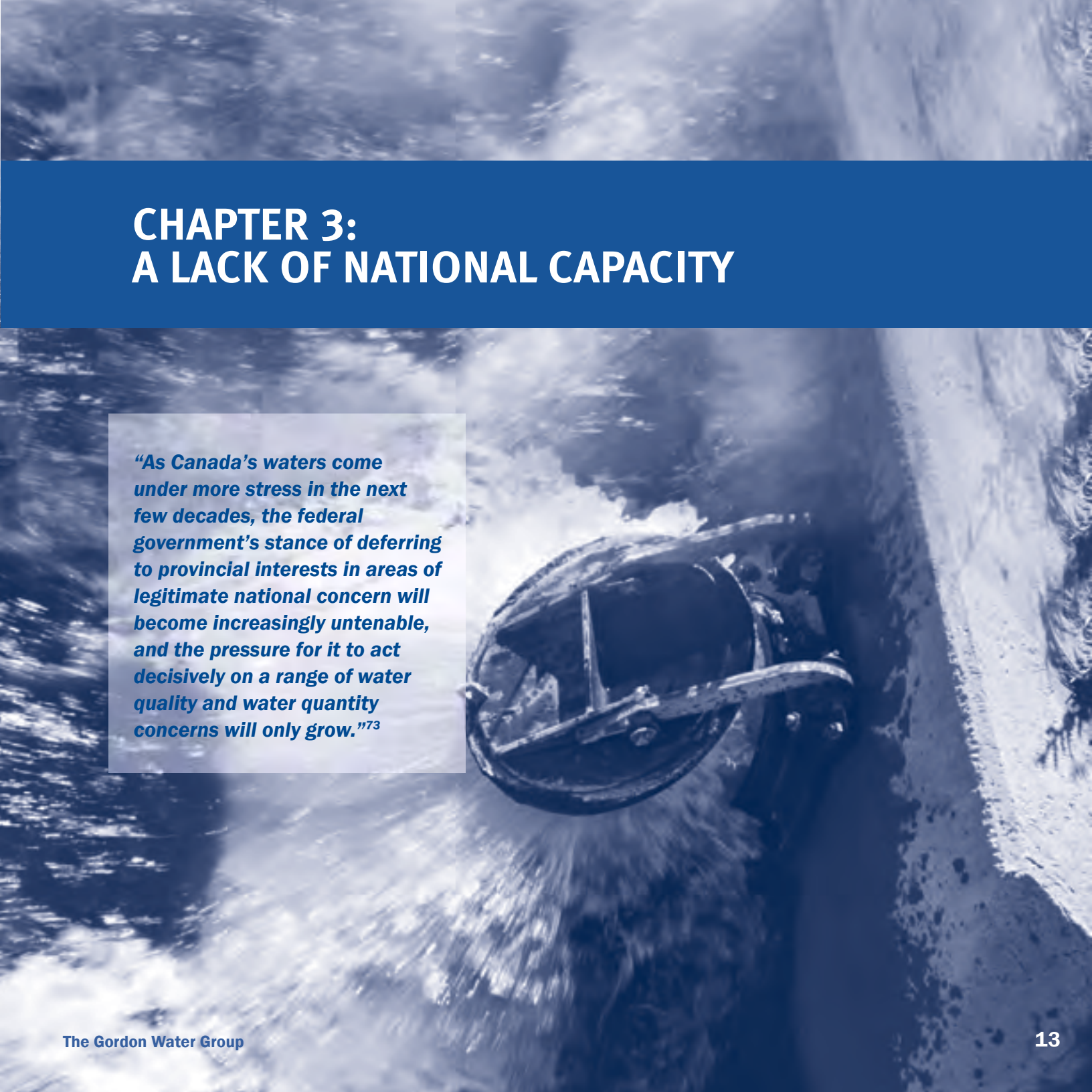
Our perception of the Great Lakes epitomizes the myth of abundance. Many Canadians see the Great Lakes as an infinite supply of freshwater, however, the Great Lakes are for the most part non-renewable resources. They were carved out by retreating glaciers and filled by meltwater thousands of years ago. On average, only 1% of the water in the Great Lakes is renewed annually by precipitation and inflow from rivers and groundwater.[70] So our seeming water abundance belies the fact that only a small portion—the renewable portion—is available for use each year.

The Economic Importance of Freshwater

The measurable contribution of water to Canada's economy is estimated to be between $7.5 and $23 billion annually, values comparable to agricultural production and other major economic sectors.[71]

A prime example of the importance of freshwater to Canada's economy is the Great Lakes-St. Lawrence river region. This region supports 45% of Canada's industrial capacity and 25% of its agricultural capacity, and contributes $180 billion to Canada-U.S. trade annually. The lakes sustain a $100 million commercial fishing industry and a $350 million recreational fishing industry and every year 1.5 million recreational boaters enjoy the Great Lakes.[72]

CHAPTER 3:
A LACK OF NATIONAL CAPACITY



"As Canada's waters come under more stress in the next few decades, the federal government's stance of deferring to provincial interests in areas of legitimate national concern will become increasingly untenable, and the pressure for it to act decisively on a range of water quality and water quantity concerns will only grow."[73]

CHAPTER 3:
A LACK OF NATIONAL CAPACITY

The problems outlined in Chapter 2 illustrate the ongoing challenges and mounting threats that face our freshwater legacy. Unmanaged, these problems will have devastating impacts on our economy, health and environment. There is now an undeniable need for leadership, commitment and action. Constitutional and practical considerations require that this leadership come from both federal and provincial governments. Yet over the last twenty years, the erosion of the federal government's commitment to protecting Canada's water has left a troubling void in our national capacity to meet ongoing problems and emerging threats.

The Constitutional Context: Shared and Overlapping Responsibilities

It is often said that provinces exercise primary constitutional power over water but in fact our constitution divides responsibilities between provincial and federal governments. Provincial governments exercise jurisdiction over water through their powers of ownership over public lands.[74] The federal government has clear constitutional powers relating to fisheries, shipping, and First Nations peoples and the lands reserved for them.[75]

It also has the power to implement any treaties concluded on behalf of Canada by the British Empire. This includes the Boundary Waters Treaty of 1909, which was signed with the United States and conveys important powers over most significant boundary and transboundary waters.[76] The federal government also has powers and duties related to the constitutionally-protected treaties that were made between the British Crown and Aboriginal peoples.[77] Water-related jurisdictions that may or may not have been ceded by First Nations as part of these treaty-making processes, and the scope of land claim agreements, add further layers of complexity to the constitutional sharing of powers over water in Canada.

Through interpretive legislation, case law and policy, the list of federal powers regarding water management can be extended to include: assisting provinces to resolve interprovincial water-related disputes; supporting comprehensive monitoring and assessment of water quantity and quality; and facilitating water-related research to improve understanding, especially in areas of national interest or regarding regional concerns affecting multiple provinces.[78] Other responsibilities relevant to freshwater include those relating to national health, pollution management, and environmental assessment.[79]

The E.U. vs. Canada

In the conclusion to her book on the future of Canada's water, Karen Bakker describes the differences between the model of harmonization and subsidiarity in the European Union and the current Canadian approach:

"The contrast between Canada and other jurisdictions, such as the European Union, is striking. In 2000, member states of the European Union reached a historic agreement. After years of negotiations, the European Parliament passed the Water Framework Directive, a legally binding policy for water management and protection in Europe...

The European approach to implementing the directive has been to balance subsidiarity (through the creation of watershed-based management organizations) with standardization of water quality norms and water management principles at the 'federal' (or European) level. Harmonization has occurred in most areas of water management.

The EU initiatives contrast sharply with the situation in Canada... Canadian water legislation is a patchwork of provincial and federal laws, and it has significant inconsistencies and gaps in responsibility and oversight. The Canadian approach to water governance has produced a set of stalemates and policy gaps. Rather than selective harmonization and subsidiarity, we have produced fragmentation and an ill-coordinated downshifting of responsibilities, leaving key areas in a policy vacuum. This is, of course, a problem that is not confined to the water sector; ... 'passing the buck' between federal and provincial governments is characteristic of Canadian resource management. But it is particularly disturbing in the case of water, given that this substance is essential for human and environmental health."[80]

The Good News...

Provincial governments are taking steps in the right direction. Following a decline in attention during the 1990s,[81] the provincial focus on freshwater has generally increased in recent years and there have been numerous efforts to improve water policy and revise legislation.[82] As well, a number of provincial governments have established comprehensive policy frameworks to guide sustainable water practices, such as *Water for Life: Alberta's Strategy for Sustainability* (2003), and Quebec's *National Water Policy* (2002). In response to the Walkerton Tragedy, Ontario is leading the way in source water protection with its enactment of the *Clean Water Act* (2006). Nova Scotia is also protecting drinking water through its *Drinking Water Strategy* (2002) and Manitoba has created a stand-alone Water Stewardship department, dedicated solely to managing and protecting water.[83] Despite these positive initiatives, there are still concerns that provincial governments have yet to commit the necessary institutional, political and financial backing to turn these general frameworks into effective action and that provincial responsibilities may be inappropriately divested to local non-state actors.[84]

Local organizations are showing leadership on the ground. Local governments and citizens' groups—municipalities, irrigation districts, watershed-based agencies such as Ontario's Conservation Authorities, and environmental groups—are assuming greater responsibility for watershed management.[85] With a special understanding of their watersheds and activities occurring within them, these organizations are often best able to develop locally-tailored, practical solutions and to make the difficult decisions required to ensure economic growth does not compromise ecosystem health.[86] However, a lack of support from senior governments can make it very hard for these organizations to succeed and concerns have been raised that governments in Canada "tend to lead with responsibility and lag with resources."[87]

What the Experts Say

In the past five years, virtually all provincial governments have revised policies, strategies and regulations for the management of their water resources... Welcome as these initiatives are, the ubiquity of water issues and the importance of secure and safe supplies lead to the question whether enough is being done.

Pollution Probe (2007)[xii]

What the Experts Say

In 1976, Environment Canada received additional funding through the [Canada Water Act] to fund federal-provincial consultative agreements for waters of "significant national interest"... Activities included...major inter-jurisdictional basin studies; involving water quantities and quality in a comprehensive river basin approach; a cooperative flood damage reduction program; and joint federal-provincial stream flow, water level, water quality and sediment monitoring programs.

Morris (2006)[xiii]

Environment Canada intended to carry out many of the actions in the Federal Water Policy through its Inland Waters Directorate. In the fall of 1993, however, the Directorate was disbanded and its large staff dispersed among the remaining services of the Department. The Department's focus on water was lost.

Commissioner for Sustainable Development (2001)[xiv]

The Bad News...

Federal interest in freshwater has dwindled. While provinces and local organizations have taken steps in the right direction, federal interest in water has undergone a serious decline.

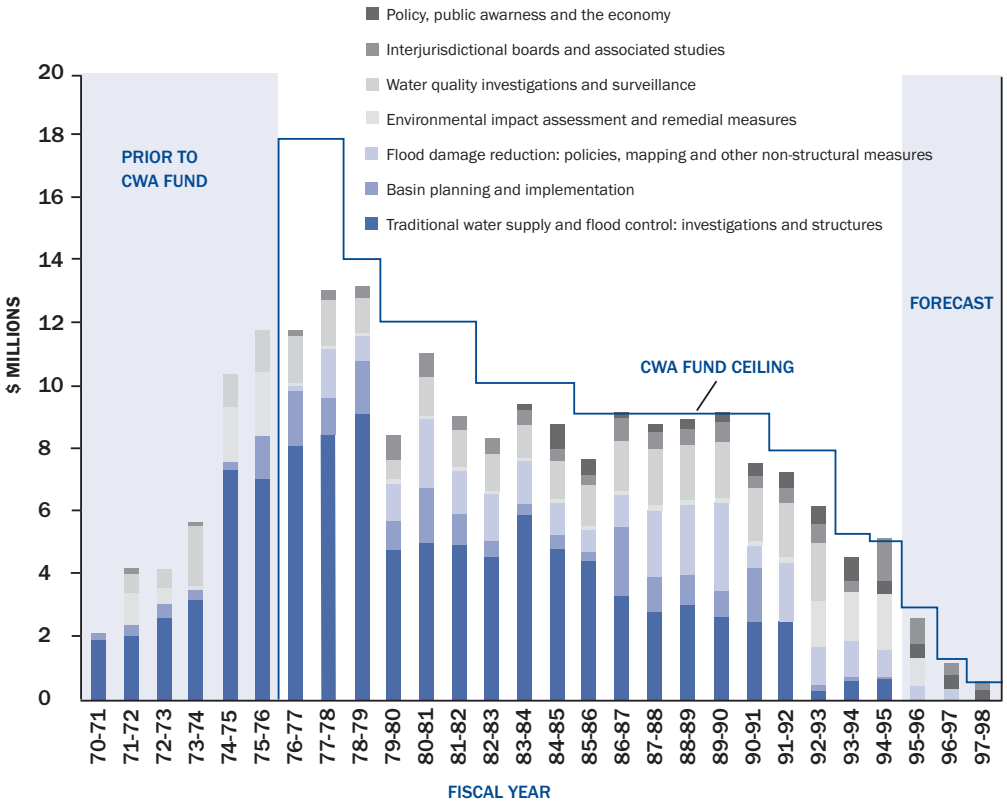
Freshwater was clearly on the federal agenda in the 1960s and early 1970s and then emerged again as a major focus in the mid-1980s. Important concerns including Great Lakes water quality, river basin planning, and water science were addressed in legislation and international agreements, such as the *Canada Water Act* (1970) and the *Great Lakes Water Quality Agreement* (1972). Institutions with a specific water focus were created, such as the Inland Waters Directorate and the Canada Centre for Inland Waters.[88] This strong federal interest culminated in the release of the Federal Water Policy in 1987, the high water mark of federal interest in water.[89] Heeding the messages of a nationwide consultation process,[90] the authors of the policy called for improved cooperation between federal and provincial governments, and a "radically new attitude toward Canada's water."[91]

Unfortunately, the 1990s saw deep budget and staff cuts, limited program implementation and a paucity of resources to maintain even basic scientific commitments.[92] At an institutional level, federal agencies and programs that focused on freshwater, such as the Inland Waters Directorate, were disbanded. As well, funding for activities under the *Canada Water Act* was slashed (see Figure 1), and the last update on progress to implement the federal water policy occurred thirteen years ago in 1994.[93] These cuts also severely curtailed the ability of the federal government to enforce environmental laws. The number of inspections carried out annually under the *Canadian Environmental Protection Act* fell during the 1990s from 2,000 to 700[94] and despite there being 38 different regulations, there have only been 34 convictions under the Act since 1998.[95] In 2001, the Commissioner for Sustainable Development concluded that cuts and lack of implementation had set our water protection capabilities "adrift."[96]

With limited resources existing agencies can only do so much. Within the federal government, there are still some excellent initiatives and programs. Unfortunately, they have been starved of the resources to make them truly effective.

In terms of scientific capacity, examples of agencies and programs that are doing good work but which need additional support include the National Water Research Institute, which continues to conduct important scientific research; the Groundwater Program of Natural Resources Canada, which is slowly but steadily mapping regional aquifers; RésEau, an internet demonstration designed to make water information more accessible; and the Prairie Farm Rehabilitation Administration, a branch of Agriculture and Agri-

FIGURE 1: CANADIAN WATER FUND ACT EXPENDITURES: 1970 -1998



All expenditures are approximate and quoted in terms of actual dollars. The CWA "fund" was not formally established until 1975 and excludes expenditures under federal-provincial water monitoring agreements; expenditures from 1970 to 1975 are reconstructed from various sources for comparative purposes.

Adapted from: Booth and Quinn, "Twenty-Five Years of the Canada Water Act" (1995) Canadian Water Resources Journal (20)2 at pp.65-90.

Food Canada, which is facilitating more effective water management in agriculture and Prairie communities.[97] Efforts are also underway to understand how we can adapt to the impacts of climate change on our water resources.[98]

With respect to environmental enforcement, Parliament's Standing Committee on Environment and Sustainable Development stated in 1998 that the main cause of ineffective enforcement at the federal level was a lack of adequate resources.[99] While some re-investment in environmental protection

What the Experts Say

In an appalling turn of events, fragmentation of water-related units became so severe in the 1990s that a "Where's Water?" team had to be assembled to determine whether or not the government's water-related duties were still being performed.

de Loë and Kreutzwiser (2007)[xv]

In the mid-1960s, many aquatic scientists, myself included, immigrated to Canada because of new and exciting approaches to water research... Unfortunately, these programs have been slowly strangled by a shortage of funds, poor salaries and the lack of replacement of departing staff.

David Schindler (2001)[xvi]

Environment Canada has persisted in singling out its water programs for cuts which are much more severe than for the department as a whole. Gains which took years to achieve are quickly being eroded.

Pearse and Quinn (1996)[xvii]

What the Experts Say

Canadians are not getting the high level of environmental protection that they expect and deserve. A number of problems precluding effective enforcement were brought to the Committee's attention. One major impediment concerns the lack of both human and financial resources to meet the challenges of an ever-increasing workload.

Standing Committee on Environment and Sustainable Development (1998)[xviii]

Years of neglect coupled with budget cuts to scientific research and monitoring programs have eroded the ability of policymakers to analyze and respond to the water issues that affect the lives of millions of Canadians.

Standing Senate Committee on Energy, Water and Natural Resources (2006)[xix]

...Canada's current system of institutions and incentives will force watershed managers to navigate the shoals ahead without the resources to determine the best course.

Conference Board of Canada (2007)[xx]

has occurred since 2000, there is still a long way to go before federal departments have the resources required to implement and enforce existing laws.[100]

Considering the resources at their disposal, the work of existing staff is quite remarkable. Yet despite the excellent work conducted by hard-working civil servants, the focus and funding that is dedicated to managing freshwater is now a shadow of what it once was.

Federal failings have diminished national capacity. As well as reducing internal capacity, the decline of federal freshwater programs and resources has affected the capacity of other levels of government and the ability of local organizations to effectively carry out their responsibilities. This overarching lack of 'national' capacity is reflected in the fact that:

- the knowledge base of water quality and quantity has major gaps—the federal government used to monitor 4,000 water quantity monitoring sites, now it only monitors 2,500;[101]
- scientific research capabilities have diminished—personnel working on environmental science for Environment Canada were cut by 26% between 1992 and 2007, and by 21% for Fisheries and Oceans;[102]
- enforcement of environmental laws is minimal—Environment Canada determined that it needed at least 300 staff for effective enforcement.[103] In 2003, it had 93 enforcement officers;[104] and,
- national water infrastructure is crumbling—Ontario alone requires an investment of at least $30 billion in water infrastructure over the next 15 years.[105]

Implications of Inadequate National Capacity

The failure of successive federal governments to ensure sufficient national capacity has put our freshwater legacy in jeopardy. Although actions are occurring at the local level and some provinces and territories have taken the initiative in encouraging local watershed management, the lack of federal commitment is undermining the effectiveness and sustainability of freshwater governance in Canada. Without assigning adequate resources to learn about our water, enforce laws, support local action and protect Canadians from emerging threats, the federal government is systematically failing to represent the common interest of the Canadian public.

What Happened to the Federal Water Policy of 1987?

Ralph Pentland, co-author of this blueprint and member of the Gordon Water Group, was responsible for drafting the federal water policy of 1987. He describes the policy's rise and fall:

"In early 1984, federal Environment Minister Charles Caccia recognized that many of the water issues that would confront Canadians over the next several decades could not possibly be addressed without effective federal leadership. Accordingly, he appointed a three person Inquiry on Federal Water Policy, and instructed it to consult widely with Canadians and report back within 18 months. The Pearse Inquiry submitted it's final report, Currents of Change, in September of 1985.

Over the following two years, I chaired an Interdepartmental Task Force, which carefully considered the Inquiry recommendations, and developed a Federal Water Policy, which then Environment Minister Tom McMillan tabled in the House of Commons in November of 1987. Shortly thereafter, the Canada Water Preservation Bill was tabled in the House, promising to prohibit water export by interbasin diversions, and the government's Green Plan promised billions of dollars in new environmental expenditures.

Canadians' hopes were raised high that their government would finally address a number of very serious water and environmental problems and opportunities. But their hopes were soon dashed. The 1987 Federal Water Policy included over 100 well thought-out commitments. Few if any were ever met in a meaningful way. The water export bill was never passed. Most of the planned Green Plan dollars evaporated, and over the 1990s, Canada plummeted from near the middle of the pack of OECD countries in terms of per capita environmental expenditures to somewhere near the bottom.

Since the National Energy Program fiasco in the early 1980s, the federal government has been particularly gun-shy about treading on provincial toes regarding resource matters. That is indeed a great tragedy, because water is not just a provincial resource. It is both a key ecological integrator across many interjurisdictional boundaries, and a critically important strategic national resource. A constructive way of looking at the turf war question is to start from the assumption that neither the federal nor provincial governments have "powers" per se. What they both do have are frequently overlapping constitutionally-defined 'responsibilities' to the same citizens, many of which are not being met."

Mounting Calls for Renewed Federal Action on Freshwater

This blueprint builds on a flood of conferences, workshops and publications—organized and produced by government agencies, parliamentary bodies, academics, NGOs and professional associations—calling for renewed federal action on water.

Throughout the 14-year life of the Federal Water Policy, the government has never formally identified its top priorities or decided how it would put them into effect in Canada's freshwater bodies. **Commissioner on Sustainable Development (2001)**[106]

The resulting continued lack of focus on water issues is lamentable. It is high time for the Government of Canada to provide leadership and focus, in a coordinated fashion, on what matters most. Water matters." **Standing Senate Committee on Energy, Water and Natural Resources (2006)**[107]

There are two levels at which a stronger federal presence may be useful. The first is the resolution of transboundary disputes between the provinces and the second is the domain of transboundary disputes between individual provinces and our American neighbours... But before it can be effective at either of these levels, the federal government in Canada has to come to terms with the absence of a coherent national water policy. **Vaux Jr. and Sandford, Rosenberg International Forum on Water Policy (2006)**[108]

What is Canada's vision? The contributors to Eau Canada have pointed out not only where we are lacking but also where we might be heading. To begin with, we would do well to revisit the 1987 Federal Water Policy, which called for "clean, safe, and secure water for people and ecosystems." **Karen Bakker, Eau Canada (2007)**[109]

[W]e recommend that the federal government should... Renew and refresh the federal water policy, in close consultation and co-operation with the provinces and other stakeholders, to ensure a national framework for sustainable water management. **Canadian Water Resources Association (2007)**[110]

[The Canadian Chamber of Commerce] recommend[s] that the federal government take a leadership role in bringing the provinces and territories together to place an urgent and high priority on water management issues in the country. **The Canadian Chamber of Commerce (2006)**[111]

CHAPTER 4:
SUSTAINING OUR WATER LEGACY

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SUSTAINING OUR WATER LEGACY

The good news for Canadians is that it is not too late to change our course and take action. We must learn from the failures of the past and ensure that our children and grandchildren are protected from the threats of the future.

This chapter establishes a blueprint for the federal actions required to guide this new course. In all cases, these action areas will require active cooperation between the federal government and provinces, territories, and Aboriginal and municipal governments to achieve success. However, these are the actions in which we expect our federal government to show leadership and a commitment to act.

Organized around seven priority areas, each section establishes the rationale for federal leadership and identifies three to four concrete actions. It is important to recognize that these areas are overlapping and complementary. Inaction in one will undermine the success of action in others.

Table: Summary of Priority Areas and Actions

Priority Area		Action
1. Enhancing National Capacity for Freshwater Protection	1	Facilitate the Development of a National Freshwater Strategy
	2	Implement a Nested Watershed Approach
	3	Formalize a Process for Sharing Best Practices
	4	Create a National Water Fund and Audit Process
2. Responding to the Impacts of Climate Change and Energy Production	5	Assist Communities in Preparing for Droughts and Floods
	6	Mainstream Climate Change into Water Policies
	7	Work with Alberta to Implement Water Use Targets in the Oil Sands
	8	Strengthen the Environmental Assessment Process
3. Securing Safe Drinking Water for All Canadians	9	Legislate Enforceable Drinking Water Protection Across Canada
	10	Provide Resources for Safe Drinking Water on First Nations Reserves
	11	Create a Comprehensive Toolkit for Preventing Water Pollution
	12	Fund Infrastructure Renewal and Link to Multi-Barrier Protection
4. Protecting Aquatic Ecosystems and Aboriginal Water Rights	13	Develop Effective Frameworks to Maintain Instream Flow Needs
	14	Improve Enforcement of Laws Protecting Aquatic Ecosystems
	15	Implement the National Action Plan on Aquatic Invasive Species
	16	Recognize and Respect Aboriginal Water Rights
5. Promoting a Culture of Water Conservation	17	Implement a National Education Program for Water Conservation
	18	Stimulate a Stronger Commitment to Reducing Water Demands in Urban Areas
	19	Foster Efficiency Improvements in Other Major Water Use Sectors
6. Preventing Interjurisdictional Conflicts and Bulk Water Exports	20	Make Support for a Strong International Joint Commission a National Priority
	21	Establish a Binding Dispute Resolution Process for Interprovincial Conflicts
	22	Prevent Bulk Water Exports and Prohibit Inter-Basin Diversions
7. Developing World Class Science	23	Create National Water Inventories and Ensure All Major Aquifers are Mapped
	24	Commit to Long-Term Investments in Strengthening Scientific Capacity
	25	Facilitate Scientifically-Informed Decision Making at the Local Level

Why the Federal Government?

- **The protection of freshwater is a national concern. The federal government has constitutional power to ensure we have a national strategy through its residual power of peace, order, and good government.**
- **The *Canada Water Act* (1970) provides legislative authority for partnerships with provinces to facilitate the coordination and implementation of water policies and programs at a national level.**

Priority 1
Enhancing National Capacity for Freshwater Protection

In order for the priority actions in this blueprint to be effective, the national capacity to implement them requires significant improvement; strengthening national capacity will be the foundation for action. Without it, we will be no further ahead than we were in 1987 when we had a federal water policy that looked good on paper but has barely been implemented since. The strengthening of national capacity should be guided by a clear strategy, and it should entail coordinated action by all levels of government, robust funding mechanisms, and clear lines of accountability.

Develop a Vision and Strategy. Considering the ubiquity of freshwater and its importance to Canadian identity, it is unforgivable that we have no national vision or strategy to guide the protection of this national treasure. It is also surprising considering there are national strategies for forests, biodiversity and oceans.[112] Around the world, other jurisdictions have recognized the importance of having a national water strategy to guide coordinated actions at all levels. Australia and South Africa created and are implementing comprehensive national water initiatives.[113] New Zealand is in the process of defining a national strategy[114] and European member states forged the Water Framework Directive to create a vision and framework for an entire continent.[115] While these are useful models, a national strategy cannot be transplanted from elsewhere. It must be based on a national consensus that takes into account the specific conditions, challenges, and needs within Canada.

Action 1:
Facilitate the Development of a National Freshwater Strategy.

Partner with provinces and territories to facilitate a Canada-wide dialogue that integrates the perspectives of different levels of government (federal, provincial, territorial, Aboriginal and municipal), water use sectors, and civil society, to inform a national freshwater strategy.

Coordinate Action at the Watershed Scale. Canadian water governance is beset by jurisdictional fragmentation, gaps in responsibility, and a lack of coordination,[116] which undermine the capacity to protect our freshwater legacy. Part of the problem is that water management has traditionally been conducted according to political boundaries. However, coordination at the watershed or basin scale is more appropriate

Action 2:

Implement a Nested Watershed Approach.

Create a federal watersheds agency to implement and support a nested watershed approach in all the major river basins in Canada. A national vision informs goals and objectives at the basin-wide level, which are formulated by federal and provincial, territorial, Aboriginal and municipal governments, stakeholders, and relevant interjurisdictional entities. Once in place, more localized watershed-based authorities, through partnerships with municipal, Aboriginal, provincial, territorial and federal governments, adapt to these goals and objectives and work with sub-watershed groups for local-level implementation.

because watersheds more clearly illuminate the interactions between cumulative human activities and the hydrological cycle.[117]

The "nested watershed approach," which matches the scale of the watershed to the scope of the institution, should be viewed as the model framework for achieving coordinated action at the appropriate level.[118] Figure 2 shows how watersheds can be nested into one another: sub-watersheds nest into watersheds, which nest into river basins, which ultimately nest into one of the five major river basins in Canada.

Local organizations will generally have a better understanding of the particular needs and characteristics of their local sub-watershed than a body with regional scope. In contrast, bodies with regional scope will have a greater appreciation for the overarching needs of the river basin and its regional influences than a local organization.[119]

There is also a need for improved sharing of experiences and knowledge between different jurisdictions within Canada. Frequently, provinces or watershed organizations are carrying out water management practices in a policy vacuum when experiences in other jurisdictions may offer insights to assist them in dealing with challenges. Instead of jurisdictions reinventing the wheel, the federal government can play a valuable role in facilitating the sharing of water management experiences between different jurisdictions.

Action 3:

Formalize a Process for Sharing Best Practices

Utilize the federal watersheds agency to ensure that jurisdictions are able to obtain information on the water management practices that have worked well in other jurisdictions within Canada, and internationally.

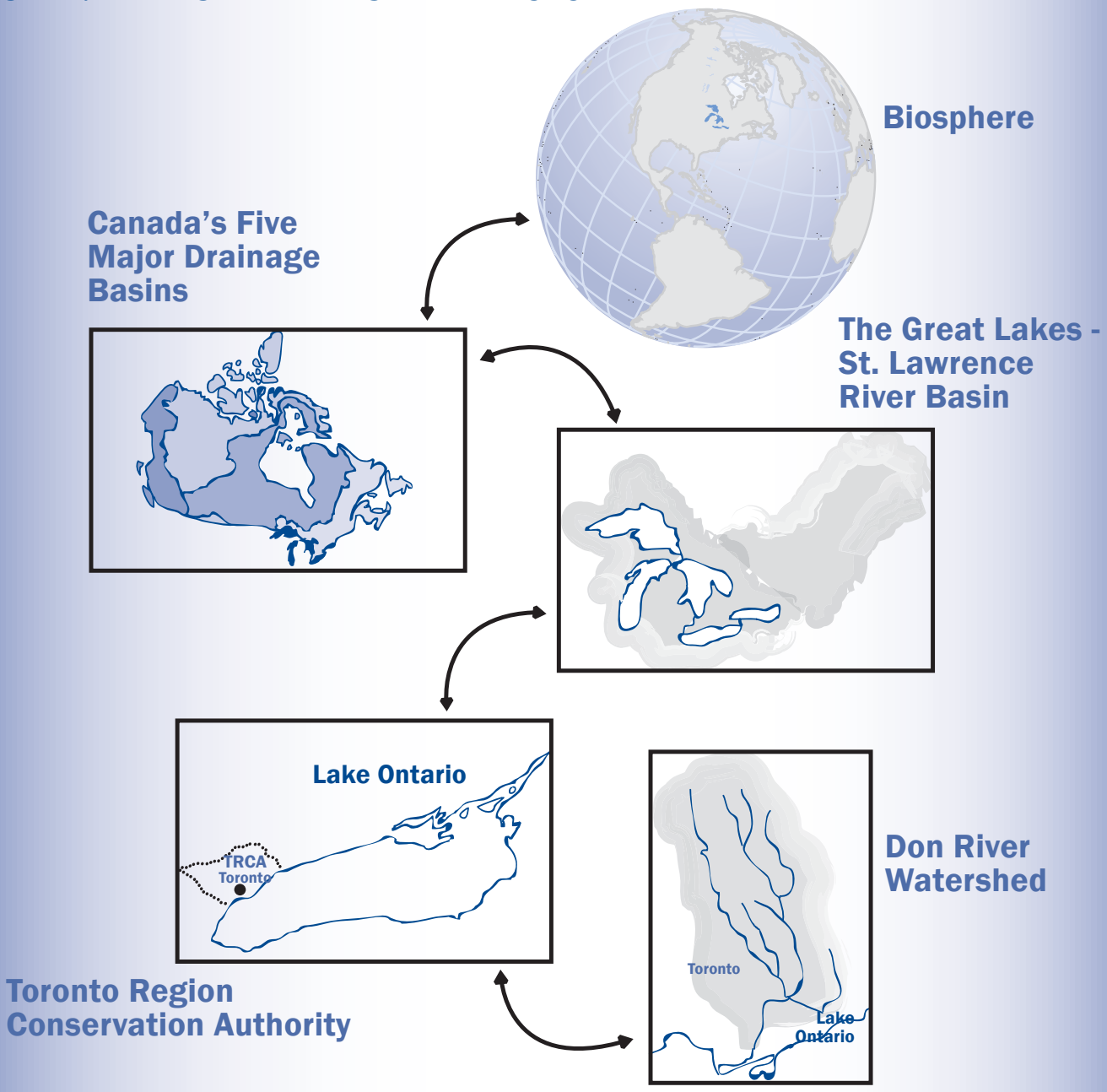
Why the Federal Government?

- **Coordination between different levels of government and local organizations is necessary because of the trans-jurisdictional character of surface water and groundwater bodies.**
- **At a practical policy level, the federal government is best placed to ensure that provincial, territorial, Aboriginal, and local government actions are coordinated and follow consistent policy directions across the nation.**
- **The *Canada Water Act* (1970) explicitly provides for cooperative agreements with the provinces for the development and implementation of plans for the management of water resources.**

What is a Watershed?

The watershed is the area of land that captures rain and snow and drains into a particular stream, river, or lake.

FIGURE 2: THE NESTED WATERSHED APPROACH



Adapted from: Bruce and Mitchell, *Broadening Perspectives on Water Issues* (1995) Ottawa, Royal Society of Canada)

Increase Financial Capacity and Accountability. The nested watershed approach encourages the devolution of decision-making to the most appropriate level, which is often the local watershed scale. Although a movement towards local action in Canada has already begun, it has occurred outside a national framework and without effective support from senior governments.[120] Further, areas where government leadership is still essential, such as law enforcement and scientific research, have been drastically under-resourced.[121] It is now critically important to reverse the trend of the last two decades to ensure sufficient financial resources are distributed through all levels of water governance.

The *Canada Health Act* is a useful model for the effective distribution of financial capacity. Under the Act, the federal government transfers funds to provinces and territories to ensure that all residents have reasonable access to medical care. Provinces and territories are required to report regularly on the operation of their health care plans and an annual report is provided to Parliament.[122] A similar mechanism was created under wide-ranging water reforms in Australia. Under the Australian National Competition Policy, payments are transferred to states according to an assessment of completed water reforms; a lack of progress by states results in suspended payments.[123] Australia has also established a designated National Water Fund, which is directed towards assisting local community organizations, accelerating the uptake of WaterSmart technologies, and improving "Australia's national capacity to measure, monitor and manage its water resources."[124]

Action 4:

Create a National Water Fund and Audit Process.

- In partnership with provincial, territorial and Aboriginal governments, establish a designated national fund for water and develop fund transfer mechanisms. Link distribution of funds to specific goals and objectives (jointly determined by federal, provincial, territorial, and Aboriginal governments) at the appropriate watershed scale.
- Require recipients to account for the use of funds and evaluate success in achieving goals and objectives. Suspend subsequent payments for poor performance.
- Ensure a yearly independent audit for federal performance and provide an annual report on the use of the National Water Fund to Parliament.

Why the Federal Government?

- **Financial support under the *Canada Water Act* Fund has consistently declined in the past two decades and is now negligible. Funding has also declined in other areas of federal funding for water initiatives.**
- **Continued failure to commit enough financial resources to freshwater protection will have serious consequences for the national economy and environment in the future.**
- **In the same way that our federal government ensures our national health through the *Canada Health Act* (1985), it should ensure that all Canadians enjoy healthy waters.**

Why the Federal Government?

- **The impacts of the climate crisis on water could cause federal disaster assistance payments to escalate dramatically.**
- **The federal government exercises the responsibility to mitigate natural disasters through the National Disaster Mitigation Strategy, part of Public Safety Canada.**
- **The Flood Damage Reduction Program, which is no longer operational, was created under the *Canada Water Act* (1970) to focus on a preventative, non-structural approach to flooding.**
- **The Climate Change Impacts and Adaptation Program of Natural Resources Canada funds assessments of vulnerability to climate change to support appropriate adaptation decisions.**

Did You Know?

In the Great Lakes region, under a warming scenario of 2°C, projections indicate reductions of hydropower generation of 25-30% and annual losses of up to $350 million due to lower water levels.[xxi]

Priority 2

Responding to the Impacts of Climate Change and Energy Production

Our nation's water resources are experiencing some of the earliest effects of the climate crisis. Warming between 1900 and 2003 has led to reduced snowfall in the west and earlier spring runoff across the country.[125] Warmer waters and drier habitats have contributed to declining salmonids and affected the productivity of cold water fish such as walleye and brook trout.[126] Future projections indicate earlier melting of snowpack in the western mountains, increasing winter and spring runoff, and a substantial decrease in summer flows. Lower water levels and flows will compromise water quality, while water temperatures will increase, shortening ice cover on lakes and intensifying oxygen depletion.[127] Without action to respond to the impacts of climate change, the environmental, social, and economic impacts will be truly profound.

Build Resilience to Climate Change Impacts on Water. Effectively responding to the climate crisis requires *mitigation* and *adaptation*.[128] Mitigation reduces greenhouse gas emissions and adaptation minimizes the vulnerability of communities to climate change impacts that are already occurring. Strengthening both mitigative and adaptive capacity ensures communities are better able to plan for and respond to the impacts of climate change, while taking steps to reduce the severity of these impacts in the future.[129] A key element of effective adaptation is planning for increasingly frequent extreme events, such as drought and flood events, which are expected to become more severe as temperatures warm.[130]

Action 5:

Assist Communities in Preparing for Droughts and Floods.

- Work with provinces, territories and communities to formalize effective drought and flood planning, and provide assistance to municipalities for emergency planning.
- Renew the Flood Damage Reduction Program and invest in infrastructure renewal that reduces vulnerability of communities to extreme flooding, for example by relocating vital infrastructure out of flood prone locations.

Most adaptive actions are not adopted in light of climate change alone. To have a practical impact, it is therefore important to integrate climate change adaptation initiatives with other programs, such as resource management, coastal

zone management, community development, and sustainable development.[131] This integration has been referred to as "mainstreaming."[132]

Action 6:

Mainstream Climate Change into Water Policies.

Integrate strategies for adaptation and mitigation into all aspects of freshwater management—as well as providing strong standalone actions, this blueprint should be viewed as a comprehensive 'no regrets' strategy for responding to the impacts of climate change on water.

Ensure Energy Developments Consider Freshwater Ecosystems. As described in Chapter 2, development of the Alberta oil sands is a major threat to the Athabasca River basin and the Peace-Athabasca Delta. If oil sands development continues along a business-as-usual path, streams and tributaries will dry up, aquifers will be exhausted or polluted, and fish habitat will continue to disappear.[133] A comprehensive evaluation of the impacts of oil sands development on water flows and quality is urgently needed and strong action is required to prevent irreversible damage to freshwater ecosystems in the region.

Other forms of energy production also have significant implications for freshwater. Hydropower generation is often presented as a green alternative but it can have serious impacts on freshwater ecosystems (discussed in Chapter 2). Approximately 64% of the water withdrawn in Canada is for thermal—coal, natural gas, and nuclear—power generation.[134] Forecasts suggest that Canadian coal production will increase to meet rising domestic consumption[135] and in some regions of Canada, such as Ontario, there is a movement towards nuclear power generation.[136] Thermal production increases water temperatures, pollutes through quarry dewatering, and poses risks from radioactive spills and the disposal of nuclear waste.[137]

An important opportunity for the federal government to assess the impacts of energy production on water is through the *Canadian Environmental Assessment Act*. Unfortunately, the Commissioner of the Environment and Sustainable Development

Action 7:

Work with Alberta to Implement Water Use Targets in the Oil Sands.

- Through the Department of Fisheries and Oceans, assist the Alberta government in establishing a hard cap for water allocations based on sustaining instream flows for healthy aquatic ecosystems.
- Work with the Alberta government to set mandatory water use targets for the oil sector to ensure compliance with the cap and to drive innovation in water conservation by the oil sector.

Why the Federal Government?

- **The federal government has a constitutional responsibility to protect fish habitat and a legal duty to enforce the *Fisheries Act* (1985) and the *Species at Risk Act* (2002) to protect aquatic ecosystems from the harmful effects of human development, including energy production.**
- **The federal government has a constitutional and fiduciary duty to limit impacts on Aboriginal rights and act in the best interests of Aboriginal peoples. Many of the rights and traditional practices of First Nations, such as fishing and hunting, are dependent on healthy freshwater ecosystems.**
- **The *Canadian Environmental Assessment Act* (1992) is triggered whenever a physical project or an activity is on federal land, receives federal funds, is carried out by the federal government, or requires certain federal permits.**

Did You Know?

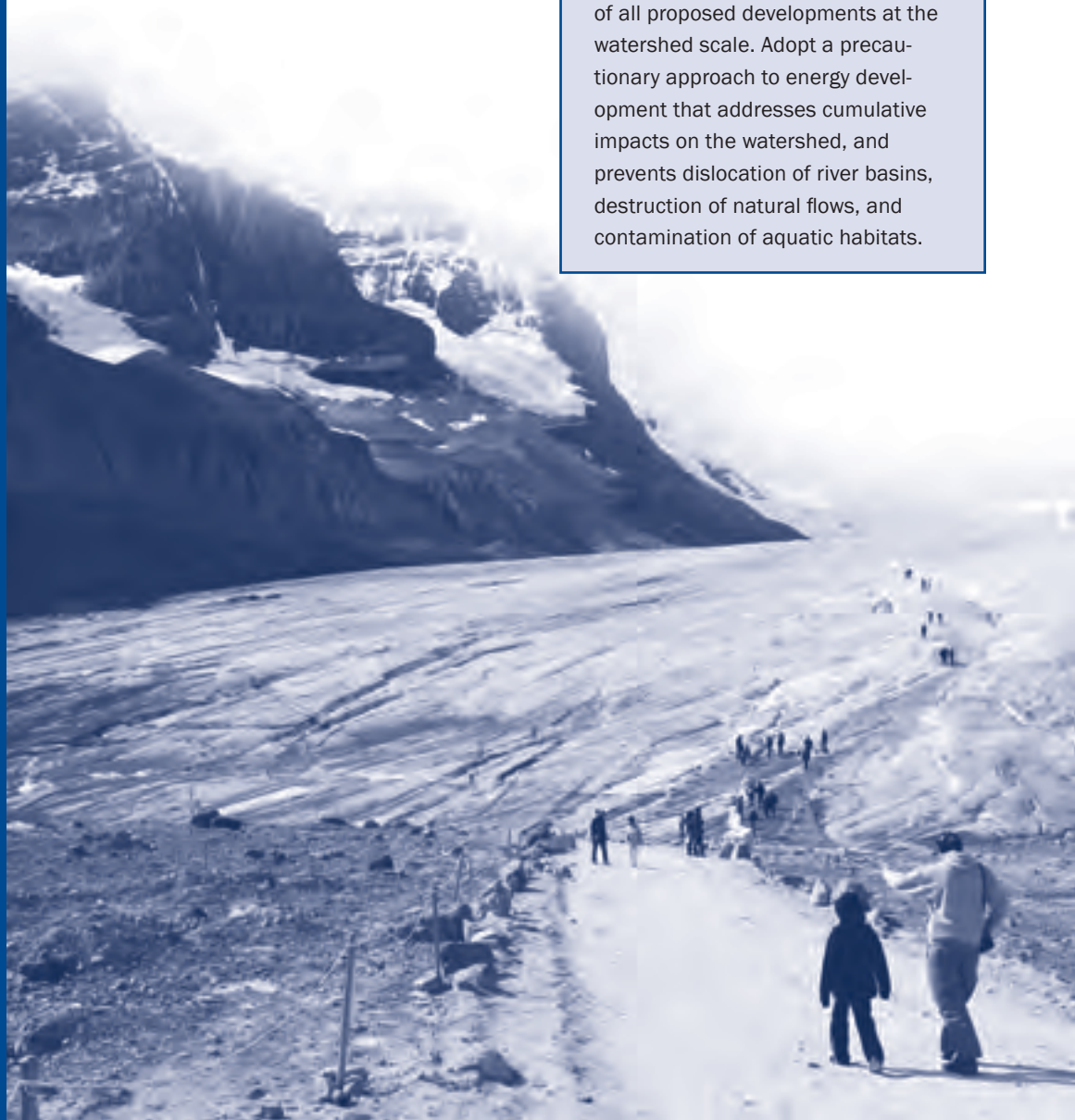
Oil sands operations are the largest single source of growth in new greenhouse gas emissions in Canada.[xxii]

identified that the federal government has failed to fulfill certain aspects of its legal responsibilities under the Act.[138] As well, a number of high-profile legal cases have highlighted the failure to adequately assess the impacts of the oil sands, dams and projects affecting fish habitat.[139]

Action 8:

Strengthen the Environmental Assessment Process.

Utilize the full potential of the Canadian Environmental Assessment Act process by assessing the impacts of all proposed developments at the watershed scale. Adopt a precautionary approach to energy development that addresses cumulative impacts on the watershed, and prevents dislocation of river basins, destruction of natural flows, and contamination of aquatic habitats.



Priority 3
Securing Safe Drinking Water for All Canadians

The Canadian government estimates that contaminated drinking water causes 90 deaths and 90,000 cases of illness annually and independent health experts suggest a much higher number of Canadians suffer from gastrointestinal illnesses related to their drinking water.[140] Despite these statistics, in most cases, provincial and municipal policies ensure our drinking water is safe for consumption.[141] Yet inconsistencies and inequities exist. As the water contamination events in Walkerton, North Battleford, and Kashechewan illustrate, problems are most severe in communities that rely on small drinking water systems and on First Nations reserves.[142]

Guarantee an Equal Playing Field. A lack of strong oversight on the part of our federal government contributes significantly to these inequities. Currently, the federal government relies on national guidelines for drinking water quality—guidelines that provincial and territorial governments are not required to implement.[143] So while provincial regulatory standards have improved, inconsistencies persist; only four provinces and territories have established legally binding and enforceable standards that meet or exceed the federal guidelines.[144] Studies have also shown that the national guidelines are generally weaker than those in Europe, Australia, and the U.S.[145] In 2005, the Commissioner of the Environment and Sustainable Development criticized the federal government for not updating the guidelines in a timely manner and described the failure to keep up with current science as "unacceptable."[146]

It is widely accepted that First Nations experience the greatest inequity in access to safe drinking water. For First Nations the problems extend beyond a lack of consistent regulatory standards. An expert panel on drinking water that was commissioned by the federal government identified the biggest challenge facing First Nations is the lack of funding and

Action 9:
Legislate Enforceable Drinking Water Protection Across Canada.

Ensure consistent drinking water requirements by replacing current Canadian Guidelines for Drinking Water Quality with a Safe Drinking Water Act that has health-based long-term objectives and legally binding minimum national standards. Legislation would act as a federal safety net and would apply on federal lands and in provinces that did not provide the same level of health protection as the national standards.

Why the Federal Government?

- **Under the Constitution, the criminal law power gives the federal government power to legislate to protect the health and safety of all Canadians. Clean and accessible drinking water is essential for health and safety.**
- **Through Health Canada, the federal government is responsible for enhancing and protecting the health of Canadians.**
- **The federal government has established legislative standards for food, drugs and bottled water through the *Food and Drugs Act* (1985).**
- **The federal government has a clear mandate and fiduciary responsibility to ensure safe drinking water for Aboriginal Canadians (First Nation, Métis and Inuit) whose communities are located on federal land.**

Standards vs. Guidelines
Standards are expected to provide a superior level of protection for human health compared to guidelines because they are legally binding and enforceable and failure to comply results in punishment. Guidelines, on the other hand, are essentially voluntary targets that water providers may strive toward but are not required to achieve.[xxiii]

Why the Federal Government?

- **The *Canadian Environmental Protection Act* (1999) is directed at reducing toxic substances in the environment.**
- **The *Fisheries Act* (1985) gives the federal government clear powers to prevent and control pollution releases into water that would affect fish habitat.**
- **The *Canada Water Act* (1970) authorizes the federal government to enter into agreements with provinces for water quality management in inter-jurisdictional waters or waters of national concern.**
- **The *Great Lakes Water Quality Agreement* was last amended by the federal governments of Canada and the United States in 1987 and needs reinvigorating.**

Did You Know?

According to Health Canada, as many as ninety-seven First Nations communities across Canada have been under drinking water advisories during 2007.[xxiv]

Action 10:

Provide Resources for Safe Drinking Water on First Nations Reserves.

Take urgent steps to provide the resources and support required for safe drinking water on federal lands and all First Nation reserves. Invest in appropriate treatment and distribution, training and ongoing support of water treatment operators. Appoint a special envoy to monitor and publicly report on progress to ensure accountability under applicable drinking water management regimes.

resources to support drinking water systems.[147] Since First Nations reserves fall under the purview of the federal government, a lack of federal support in this area is inexcusable.

Prevent Pollution of Water Sources. A multiple barrier approach that comprehensively addresses threats to water quality all the way from source to tap and back to source is necessary to secure safe, reliable drinking water.[148] The first barrier in this approach is the prevention of contaminants from reaching sources of drinking water.[149] Since the Walkerton and North Battleford disasters, source water protection has become a focus for a number of provincial governments.[150] At the federal level, progress has occurred through the reduction of certain forms of industrial pollution due to strong regulations under the *Fisheries Act* and *Canadian Environmental Protection Act* (CEPA) and through the *Great Lakes Water Quality Agreement*.[151]

However, pollution continues to compromise the quality of our water sources. Of particular concern to scientists is the growth in toxic pollutants, which are finding their way into surface and ground water sources through industrial discharge, municipal sewage, and non-

Action 11:

Create a Comprehensive Toolkit for Preventing Water Pollution.

- Increase monitoring and enforcement of pollution laws.
- Require a minimum of secondary wastewater treatment for all Canadian municipalities.
- Make pollution prevention plans mandatory for large industrial polluters and reverse the burden of proof under CEPA so that industry wanting to introduce a new chemical is required to provide satisfactory evidence that it is safe.
- Enshrine the substitution principle in CEPA so that safer substitutes must replace toxic substances as alternatives become available.
- Develop a public education campaign to alert householders of the dangers of PPCPs.
- Provide financial support to provinces and territories to facilitate more effective controls on non-point source pollution.

point sources. Some of these chemicals degrade very slowly, bioaccumulate, and can have impacts even at low levels.[152] While the global list of toxic chemicals is rapidly expanding, domestic processes for screening and listing these chemicals under CEPA are slow.[153] In addition, the ability to effectively address new pollutants with potentially profound effects, such as pharmaceuticals and personal care products (PPCPs), is undermined by the government's 'innocent until proven guilty' approach to chemical regulation, which requires conclusive evidence of health or environmental harm before regulatory steps are taken.[154]

Renew Our Crumbling Infrastructure.

Another critical feature of the multi-barrier approach is secure and robust water infrastructure, including water treatment facilities, distribution systems, and wastewater treatment.[155] Major sources of water pollution in Canada are combined sewer systems, which are common in our older, larger cities, such as Vancouver, Edmonton, Toronto, Hamilton and Montreal.[156] These systems require upgrading, and improvement is also needed in standards of wastewater treatment. Only 40% of Canadians are served by tertiary sewage treatment—the most effective form of treatment—compared to 70% in European cities.[157] With respect to distribution systems, it is estimated that Ontario is losing 20-40% of all treated water to the ground through old and leaky pipes, costing ratepayers up to a billion dollars annually.[158] Aging pipes also pose health risks. Lead has been found in drinking water as a result of leaching from old service lines in cities such as London, Montreal and Toronto. This is a significant concern since lead poses a particular threat to the development of small children.[159]

Unfortunately, Canada's water infrastructure problems seem likely to worsen unless efforts are taken to reduce the current deficit in water infrastructure, estimated to be as much as $100 billion.[160] Although more sustainable municipal pricing structures may alleviate some of the deficit, it is unrealistic to expect that this action alone will eradicate the deficit. Many municipalities, especially those that are remote or have smaller populations with a lower tax base, require financial support for infrastructure to enable the efficient provision of safe drinking water to residents.[161]

Action 12:

Fund Infrastructure Renewal and Link to Multi-Barrier Protection.

- Enter into new cost-sharing arrangements with provincial governments to increase grants to municipalities for the renewal and restoration of water infrastructure. Infrastructure funding should encourage sustainable infrastructure planning, green infrastructure, water conservation, and source water protection.
- Encourage municipal governments to recover the costs of water supply and treatment through appropriate pricing mechanisms.

Why the Federal Government?

- **Through Infrastructure Canada, the federal government provides financial assistance for water and wastewater infrastructure under its Municipal Rural Infrastructure Program and Infrastructure Canada Program.**

Did You Know?

Less than half of Atlantic Canada's population is served by sewage treatment.[xxv]

Why the Federal Government?

- **The *federal government* has a constitutional responsibility for protecting navigable waters and inland fisheries.**
- **The *Fisheries Act* (1985) and the *Species at Risk Act* (2002) provide the Department of Fisheries and Oceans Canada and Environment Canada with the legislative mandate to act as advocates for aquatic ecosystem health.**
- **Under section 35 of the *Fisheries Act* it is an offence to "carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat."**
- **Fish do not confine themselves to provincial boundaries. The federal government has a role in ensuring provincial activities account for extraprovincial impacts on fish.**

What are instream flow needs?
Instream flow needs (IFNs) are the amount and timing of water necessary to support aquatic ecosystems. Maintaining IFNs is critical for aquatic ecosystem sustainability and requires an appreciation of the complex connections between surface water bodies, floodplains, associated uplands and groundwater connections.[xxvi]

Priority 4
Protecting Aquatic Ecosystems and Aboriginal Water Rights

Healthy aquatic ecosystems provide the foundation for both a vibrant economy and social prosperity—protecting this foundation is critical to sustainable water management. Unfortunately, aquatic ecosystems throughout Canada are under threat from climate change, excessive water withdrawals, diversions and dams, pollution and non-native species. These threats also carry grave implications for the cultural and economic survival of Aboriginal peoples who are especially reliant on healthy freshwater ecosystems. Aboriginal communities have unique relationships with land and water, and governments are required to respect these relationships by honouring Aboriginal rights.

Keep Our Rivers Flowing and Our Fish Alive. Protection of aquatic ecosystems requires effective identification and strong enforcement of the instream flow needs (IFNs) of fish and aquatic habitat.[162] It is complicated but not impossible to effectively identify the flows and quality of surface and ground water needed to maintain the health of aquatic species and ecosystems. It involves comprehensive ecosystem-based assessments that entail interdisciplinary science, intergovernmental cooperation, and an appreciation for diverse public values.[163] According to its powers relating to fisheries, these are all areas in which the federal government can play a legitimate and important supportive role. Yet instream flow needs have fallen through the cracks in Canada. While some limited provincial programs have been initiated for selected rivers and streams,[164] federal practice and interjurisdictional frameworks, such as the Prairie Provinces Water Board (PPWB), the Mackenzie River Basin Board (MRBB), and the International Joint Commission (IJC), lack authority to address IFNs.[165]

Action 13:
Develop Effective Frameworks to Maintain Instream Flow Needs.

- Provide support to provinces and territories to establish effective instream flow programs that determine IFNs. Provide guidance on legal/institutional reforms that may be necessary to reallocate water resources to meet those needs.
- Define an effective federal role in maintaining IFNs and partner with provinces, territories, and the U.S. to develop clear mandates and roles for interjurisdictional bodies such as the PPWB, MRBB and IJC in determining IFNs.

In terms of the *enforcement* of aquatic ecosystem flows, the federal government has an even clearer role under its constitutional power for fisheries protection and the *Fisheries Act*. The federal Department of Fisheries and Oceans can lay charges against anyone interfering with the quality or quantity of flows needed for fish habitat.[166] Official policies acknowledge that water withdrawals may impair fish habitat and that these withdrawals need to be regulated under the *Act*.[167] Unfortunately, the federal government has appeared reluctant to fulfill its responsibilities to protect fisheries and has been criticized for its failure to safeguard fish habitat,[168] and for its unwritten policy of grandfathering historical water uses.[169]

Action 14:
Improve Enforcement of Laws Protecting Aquatic Ecosystems.

Assume a much stronger role in protecting ecosystem needs for water and in enforcing its powers under the Constitution and the *Fisheries Act*. Apply section 35 of the Fisheries Act to historic water uses and make secondary wastewater treatment a minimum requirement for all outflows that could impact fish habitat.

Block the Invasion of Alien Species. A new invasive species enters the Great Lakes every eight months and the International Joint Commission (IJC) states that "[a]ny one of these new invaders could prove to be as ecologically and economically destructive as those already in the system, if not more so."[170] This is clearly an area requiring urgent action, but Parliament's Standing Committee on Fisheries and Oceans has expressed concern over the slow progress the federal government is making on addressing the threat of aquatic invasive species and has had to reiterate a number of recommendations made in past reports.[171] To protect the Great Lakes-St. Lawrence River ecosystem from aquatic invasive species, the IJC has also made a number of recommendations for urgent actions that have not yet been implemented.[172]

Action 15:
Implement the National Action Plan on Aquatic Invasive Species.

- Reflect recommendations of the Standing Committee on Fisheries and Oceans and the IJC in implementing the action plan.
- Include mandatory ballast water management practices for ships with no ballast on board (NOBOBs), mandatory standards for ballast water treatment and a reference to the IJC to coordinate binational efforts in the Great Lakes.
- Prohibit all interbasin diversions and subject all intra-basin transfers to a comprehensive environmental assessment.

Why the Federal Government?

- **The federal government has constitutional powers to address aquatic invasive species through responsibilities for navigation and shipping, and sea coast and inland fisheries.**
- **Aquatic invasive species pose a significant threat to the ecosystems of international boundary waters for which the federal government has primary responsibility under the constitution and the *Boundary Waters Treaty* (1909).**
- **The federal government has worked with provinces and territories to develop the National Action Plan on Aquatic Invasive Species, which divides leadership between federal and provincial/territorial governments.**
- **Through Transport Canada the federal government is responsible for regulating shipping practices, including ballast water management.**

Did You Know?
As of 2006, at least 200 invasive aquatic species were established in the Great Lakes and one estimate has indicated that these species have caused a loss of US $5.7 billion annually to the region.[xxvii]

Why the Federal Government?

- **Section 35 of the *Constitution Act* (1982) recognizes and affirms the Aboriginal and treaty rights of Aboriginal peoples in Canada.**
- **Aboriginal rights are unique or *sui generis* and the federal government owes a special fiduciary duty to Aboriginal peoples. This duty requires the federal government to act in the best interests of First Nations (particularly regarding land-related matters) and to minimize impacts on Aboriginal and treaty rights.**

In September 2004, the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM) approved a National Action Plan to address the issue of aquatic invasive alien species in Canadian waters[173] but this action plan has yet to be implemented. As well, ballast water regulations introduced by Transport Canada in 2006 fail to adequately address the threat of invasive aquatic species because they exempt transoceanic ships with no ballast water on board (NOBOBs), even though they are carriers of foreign species.[174]

Recognize the Rights of Aboriginal Peoples. Aboriginal title, Aboriginal rights and treaty rights have been recognized on paper through our Constitution and in legal decisions.[175] However, in practice, the extent of these rights is still being defined. Many activities that are protected as Aboriginal rights are closely tied to water such as fishing, hunting, gathering, and spiritual practices. Activities such as industrial pollution or dam development, that affect the quantity or quality of water in Aboriginal territory may therefore interfere with Aboriginal rights.[176]

There is currently no formal recognition of reserve water rights in Canada. In contrast, the *Winters* doctrine in the U.S. legally acknowledges that when government reserved land for indigenous peoples, "water sufficient to fulfill the purposes of the reservation of land" was required.[177] This U.S. doctrine has been described as an unknown with almost "thermonuclear" potential to change the water policy landscape[178] and is an indication that reserve water rights could be recognized in Canada in the future.[179]

Action 16:

Recognize and Respect Aboriginal Water Rights.

- Work with provincial and territorial governments to ensure Aboriginal interests in water are recognized and respected.
- Ensure that all governments obey their duties to consult and accommodate and to minimize impacts on aboriginal and treaty rights.
- Rather than waiting for a protracted and expensive legal decision to transform the water policy landscape overnight, the federal government should take a proactive stance to work with Aboriginal governments and communities, as well as the provinces and territories, to fully and fairly implement a cooperative approach to recognizing aboriginal water rights.

To date, progress on water conservation

Priority 5
Promoting a Culture of Water Conservation

in Canada has been limited and piecemeal. Some municipalities now incorporate water efficiency programs into management strategies and others, like Calgary and Victoria, are looking to meet all future growth in demand through conservation.[180] At the same time, rapidly growing centres across the nation continue to follow the old hard path of supply-side management, developing new water sources and investing in engineered solutions and infrastructure such as reservoirs, powerful pumps and large pipelines.[181] The story is similar in other sectors such as agriculture, which is Canada's largest consumer of water, with most of the water consumed for irrigation purposes.[182] Despite improvements to agricultural water efficiency, old proposals to dam up prairie rivers to supply irrigators with water have resurfaced, threatening to further fragment fragile ecosystems.[183]

Dispel the Myth of Abundance. The myth of abundance persists and is a key contributor to our excessively high water use in Canada.[184] The average Canadian uses 343 litres of water per day for domestic uses. This is compared to 200 litres in Sweden and 150 in France.[185] In terms of total water use by all sectors, Canada uses more than twice the amount of water per capita than France, three times the average in Germany, and eight times the average in the United Kingdom.[186] In the Rosenberg International Forum on Water Policy it was stated that "[t]here is an urgent need for public information campaigns that dispel the myth of limitless abundance of water in Canada."[187] The importance of educating the public about the conservation of water has been recognized by the government in New Zealand, which introduced the National Water Awareness campaign to encourage increased personal responsibility in water use in the home and the workplace.[188]

Action 17:
Implement a National Education Program for Water Conservation.

- Under the supervision of a National Water Efficiency Institute, lead a national education campaign to dispel the myth of water abundance. In collaboration with provinces and territories, the Institute would raise public awareness of the importance of water conservation through social marketing, school curriculums, and community events.
- Build capacity for comprehensive conservation by facilitating the sharing of best practices, offering direction on the use of economic instruments, launching product rating programs, providing water auditing tools and creating model building codes and bylaws.

Why the Federal Government?

- **The *Canada Water Act* (1970) enables the federal government, directly, or in cooperation with any provincial government, to undertake public information programs.**

What is the Water Soft Path?
The water soft path can be distinguished from conventional planning and management because it treats water as a service to accomplish specific tasks—such as sanitation or an attractive yard—rather than an end in itself. It matches the quality of water delivered to that needed by the end use (lower quality of water can be used for irrigation or thermal cooling than for drinking water). Under the soft path, ecological sustainability is a fundamental criterion and planning operates backwards from a desired future state ('backcasting'). [xxviii]

What are Withdrawals vs. Consumptive Uses?
Water withdrawals occur any time that water is taken out of a water system and includes water that is later returned to that system. Water consumption is the amount of water that is not returned to and is considered lost to that system. This occurs as a result of evaporation, transpiration, or some other process. In Canada, irrigation is the largest consumer of water, but thermal power plants withdraw the largest amount of water. [xxix]

Why the Federal Government?

- **Maximizing the efficiency of existing water supplies minimizes the need for federal grants for future expansion of water infrastructure. This will allow greater focus on renewing and repairing existing infrastructure and reducing the considerable water infrastructure deficit.**
- **The climate crisis is a global and national priority. Building and operating more supply-side infrastructure requires considerable amounts of energy, much of which is produced from fossil fuels. In contrast, water conservation reduces greenhouse gas emissions and allows communities to adapt to diminished supplies.**
- **The federal *Energy Efficiency Act* (1992) has successfully increased energy efficiency in a wide range of household appliances by prescribing clear efficiency standards and prohibiting the import of products that do not meet the standards.**

Did You Know?

One in four Canadian municipalities experienced water shortages between 1994 and 1999.[xxx]

Stop the Search for New Supplies.

Climate change, excessive water allocations, and the need to secure water for aquatic ecosystem protection all represent real constraints on water supplies for human activities. Respecting these constraints, while also maintaining our prosperity and well-being, will require a rapid shift away from the traditional approach of seeking out new water supplies towards a comprehensive and strategic approach to water conservation and efficiency—a 'soft path' for water. Rather than developing new sources of supply, the soft path relies on community engagement, long-term planning, innovative policies and water-efficient technologies to maximize the productivity of current withdrawals and reduce water demands.[189] Reducing and better managing our water demands is the most effective means of finding 'new' water for community and economic development.[190] Not only is it often cheaper than seeking out and developing new sources of supply, it can be implemented more quickly to respond and adapt to changing conditions such as those posed by the climate crisis.[191]

Action 18:

Stimulate a Stronger Commitment to Reducing Water Demands in Urban Areas.

- Encourage a shift away from supply-side management by making all infrastructure grants contingent on effective water efficiency plans that include measurable and enforceable targets and objectives.
- Promote water conservation practices with financial incentives, and through financial support for universal water metering.
- Introduce a Water Efficiency Act, modeled on the Energy Efficiency Act, to set mandatory water efficiency standards for appliances and phase out outdated technologies such as 13-litre toilets.
- Provide additional resources to the Federation of Canadian Municipalities to enable more rapid development of green communities.

Action 19:

Foster Efficiency Improvements in Other Major Water Use Sectors.

- Implement regulations for thermal power production—which makes up two-thirds of the total water withdrawals in Canada—that require water used for cooling purposes to be recycled.
- Create an aggressive agricultural water efficiency program and work with provinces and the agricultural sector to replace subsidies for water use with incentives for water efficiency techniques such as effective water scheduling, drip irrigation, water reuse, and off-stream storage (where appropriate).

Priority 6
Preventing Interjurisdictional Conflicts and Bulk Water Exports

Canada and the United States share the longest common border between two countries that is not militarized or patrolled. Over its length—8,850 kilometres—the boundary passes along or intersects many economically and environmentally significant rivers and lakes.[192] For over a century, a strong cooperative spirit has marked the relationship between Canada and the United States over shared boundary waters.[193] This cooperation will be critical in the future if both countries are going to be capable of addressing the new wave of stressors that arose in the latter decades of the 20th century, including invasive species, persistent organic pollutants, endocrine disrupters and climate change.[194] We should also be aware that the pressure for Canada to export its freshwater could increase as a result of growing populations in areas of the world that are becoming increasingly arid due to climate change, such as the southern United States or dry regions in Asia.

Strengthen Bilateral Cooperation and Oppose Unilateralism. Despite the growing pressures on international boundary waters, the International Joint Commission (IJC), the binational institution created under the Boundary Waters Treaty of 1909 to resolve disputes over international boundary waters, has lost effectiveness with declining financial, technical and political support.[195] Admired around the world as a model of international cooperation over shared waters, the IJC's historical successes resulted from the support it received from Canadian and U.S. federal governments.[196] In recent years, conflicts such as the Devils Lake dispute, that appear custom-made for IJC investigation, have been withheld from the organization's purview in favour of unilateral actions.[197] There has also been a decline in the level of support provided by the federal governments to the IJC to assist

Action 20:
Make Support for a Strong International Joint Commission a National Priority.

- Work with U.S. counterparts to inject the IJC with the capacity it needs—financial, technical, and staffing—to evolve to meet new challenges.
- As recommended by the IJC, establish Binational Watershed Boards in all significant international boundary basins. These boards would work collaboratively with provinces, states, local organizations, and citizens to build cooperation and capacity at both regional and local levels.

Why the Federal Government?

- **The federal government has constitutional powers that relate to the management of international boundary waters including the power to implement treaties concluded on behalf of Canada by the British Empire.**
- **The federal government is responsible for implementing the *Boundary Waters Treaty* (1909)**
- **The federal government is responsible for international relations through the Department of Foreign Affairs and International Trade.**
- **Provincial governments cannot enter into international treaties or make official references to the International Joint Commission.**
- **Rising tensions over water may impact other aspects of the binational relationship such as trade or security, for which the federal government is responsible.**

Why the Federal Government?

- **The *Canada Water Act* (1970) authorizes the federal government to enter into agreements with provinces to develop plans for water management.**
- **Both the Master Apportionment Agreement and Mackenzie River Basin Master Agreement are examples of cooperative agreements between the federal government and provinces.**
- **The general federal power to legislate for peace, order, and good government is a source of constitutional authority with respect to issues of national importance, such as major river basins that cross one or more provincial or territorial boundaries.**

Action 21:

Establish a Binding Dispute Resolution Process for Interprovincial Conflicts.

- Create a binding dispute resolution process to encourage provinces to negotiate stronger and more equitable arrangements among themselves and to ensure a fair and sustainable outcome if an agreement cannot be reached.

in the implementation of the Great Lakes Water Quality Agreement.[198] Given such failures to empower and engage a body designed for the very purpose of ensuring binational cooperation, it is not surprising that tensions over shared water resources are rising between Canada and the United States.[199]

Assist Provinces in Resolving Differences. As well as international boundary waters, the federal government has an important role to play in the management of interprovincial boundary waters. Rivers and lakes do not respect provincial boundaries. Downstream provinces may have quite different ideas from upstream provinces on how a watershed should be managed and how shared waters should be used. The federal government plays a unique role in anticipating, avoiding and resolving disputes over interprovincial waters and in ensuring fair agreements are reached and respected.

The Master Apportionment Agreement relating to waters that flow east across the Prairies is a relatively successful example of interprovincial cooperation.[200] By contrast, the Mackenzie River Basin Master Agreement, which deals with waters shared among Saskatchewan, Alberta, British Columbia, Yukon and Northwest Territories[201] remains weak. Since the agreement came into effect in 1997, little progress has been made in negotiating details of water sharing and other responsibilities.[202]

Ensure that Canadian Water is Not For Sale. The majority of Canadians oppose bulk water exports.[203] In response to public opposition, the federal government legislated a prohibition on diversions from boundary waters, and nine provinces

Action 22:

Prevent Bulk Water Exports and Prohibit Inter-Basin Diversions.

- Negotiate a specific exemption to NAFTA for freshwater as was done for raw logs and unprocessed fish.
- Legislate a safety net provision that would require the federal government to stop bulk water exports where existing regulations fail to do so.
- Ensure that large-scale diversions between all major watersheds within Canada are expressly prohibited. Ecologically, these diversions are just as damaging as exports to other countries.

passed laws prohibiting bulk water exports. Only New Brunswick has not followed suit.[204] Despite these laws, loopholes that may permit bulk water exports still exist. Alberta, Manitoba, and Nova Scotia have loopholes allowing the provincial governments or legislatures to make exceptions to the rules prohibiting bulk water exports.[205]

In addition, provincial laws that prohibit water exports may be unconstitutional under Canadian law[206] or susceptible to challenge under the North American Free Trade Agreement on the basis that they are out of proportion with the objective of environmental protection, a permitted exemption under NAFTA.[207]

Why the Federal Government?

- **The federal government has constitutional responsibility for trade and commerce.**
- **The federal government signed the NAFTA agreement with United States and Mexico, which began in 1994.**
- **Bulk water exports are an issue of national concern and thus fall under the purview of the federal government's residual power of peace, order and good government.**
- **Federal governments have consistently claimed that Canadian water is not for sale but there are currently no legal assurances that this is indeed the case.**

Why the Federal Government?

- **The federal government has a constitutional responsibility for developing and maintaining national statistics.**
- **The *Canada Water Act* (1970) enables the federal government, directly, or in cooperation with any provincial government, institution, or person, to conduct research, collect data, and establish inventories associated with water resources, and to undertake public information programs.**
- **There is an information void when it comes to Aboriginal communities. The federal government has a responsibility to assist Aboriginal communities in generating information at the watershed level and providing the capacity to develop tools, models and indicators to use this information.**

Priority 7
Developing World Class Water Science

Effective water governance depends on detailed, current, and publicly accessible information about water quality, quantity, climate change impacts, water flows and availability, urban, industrial and agricultural use, groundwater resources, sediment transport and ecosystem needs for water. Concerns over water issues in Canada are increasing, yet the quantity and currency of information are eroding. The number of groundwater observation wells has declined, flow measurement stations on main tributaries have been largely removed due to lack of funding, and surface water and precipitation monitoring systems are poorly resourced, designed and coordinated.[208]

Take the Lead on Water Science and Monitoring. Much of the information required may be available but is scattered among levels of government, and private and non-profit organizations. Universities, federal research agencies, provinces and municipalities, and also industry and energy sectors all conduct research valuable to sustainable water management. For example, mining companies undertake considerable research to understand groundwater systems.[209] This research is not always publicly available or widely disseminated. This lack of data coordination presents a serious challenge to effective watershed protection. A positive step is the federal government's development of an internet demonstration project called RésEau which is designed to better coordinate information and make it accessible at the national level.[210]

While improved coordination would greatly assist Canada's water science needs, there are some areas of data collection and research that the federal government is best positioned to lead, such as conducting long-term studies that are consistent over time—something which academic institutions are rarely capable of doing—and comprehensive monitoring of water quantity and quality.[211] Unfortunately, as was described in Chapter 3,

Action 23:
Create National Water Inventories and Ensure All Major Aquifers Are Mapped.

- Place a high priority on strengthening RésEau to provide accessible inventories of national water quality, water availability, and water use for surface and ground water.
- Ensure that all major aquifers in Canada are mapped by 2010.
- Work with industry and provinces to develop guidelines to ensure high quality water data is collected and reported in a consistent manner across the country.

Action 24:

Commit to Long-term Investment in Strengthening Scientific Capacity.

- Dedicate additional capacity—financial, technical, staff—to federal water research institutes and ensure their research is independent of political pressures.
- Increase the number of flow monitoring stations, observation wells and water quality testing sites. Conduct long-term studies of water quantity and quality.

federal institutions that were once international leaders on water science, such as the National Water Research Institute, National Hydrology Research Centre, and the Geological Survey of Canada, are now severely under-resourced.

Make Science Publicly Accessible and Understandable. The federal government is also well placed to develop tools and approaches to translate data and research into forms that are accessible and useful to the public, local decision-makers and policy developers at all levels. In particular, the work of local watershed groups would be enhanced by access to appropriate science-based tools. In some cases, these local groups may be the most appropriate bodies for collecting, managing and interpreting data, and their capacity to do this work effectively would benefit from federal government support. There is also a need for a stronger commitment to broaden the concept of science to include social sciences and economics. This will bring science to the political reality of conflicting human values and help develop adaptive approaches that are flexible and dynamic like the systems we are trying to protect.[212]

Action 25:

Facilitate Scientifically-Informed Decision Making at the Local Level.

Assist communities, local organizations, and citizens with interpreting and utilizing scientific information by developing and supplying simple, automated, interactive tools to help them examine options and reach rational decisions.

Why the Federal Government?

- **The *Canada Water Act* (1970) authorizes the federal government to distribute or publish information to inform the public on any aspect of the conservation, development or utilization of the water resources in Canada.**

Did You Know?

Environment Canada's last full industrial water survey is over a decade old.[xxxi]

Canada and the International Water Crisis

This blueprint focuses on federal government actions to address domestic water issues. Canada's federal government also has a vital role to play in addressing the global water and sanitation crisis, one of the greatest development challenges and potential disasters of the 21st century. More than 1 billion people in the world do not have access to clean water and 2.6 billion lack access to adequate sanitation.[213] The number of environmental refugees—including those forced to leave regions due to water shortages—is currently 30 million people and is predicted to increase at an alarming rate.[214] Further, the world is rapidly changing, and the pressures of population growth, urbanization, globalization, and a changing climate are increasing the risk that the crisis will escalate.[215]

To date, the international community has failed to galvanize the will to tackle the water and sanitation crisis and the United Nations Development Programme (UNDP) has stated that the current global trends will leave the world on a trajectory to "finish below the floor defined by the Millennium Development Goals."[216] Canada is complicit in this failure and has shown a disappointing lack of leadership on the world stage. Canada has a long-standing pledge to meet the United Nations' goal of devoting 0.7% of its gross national income to development assistance.[217] However, data for 2006 indicates that the federal government spent only 0.30% of GNI.[218] In 2003-2004, only 7% of Canada's total development assistance was spent on water and sanitation.[219]

Canada is also one of 146 states that have ratified the International Covenant on Economic, Social and Cultural Rights, which the U.N. points to as the source of the human right to water.[220] The human right to water acknowledges that all citizens have the basic right to sufficient, safe, physically accessible and affordable water for personal and domestic uses (it does not extend to other uses such as industry, transportation or recreation).[221] Unfortunately, Canada does not support the U.N.'s interpretation of the Covenant and has yet to recognize that safe, accessible water is a basic human right.[222] This is contrary to a growing international consensus of states, intergovernmental agencies such as the World Health Organization[223] and influential NGOs such as Amnesty International,[224] Wateraid,[225] and WaterCan,[226] that believe that a human right to water can make a real difference in the lives of the world's poor.

Like all wealthy nations, Canada needs to make water and sanitation a higher priority in aid and foreign policies. It is in our national interest to meet the growing global water crisis head-on. Recognizing and supporting the human right to water and increasing Canadian expenditures on upgrading foreign water management creates a win-win situation. Not only would these actions improve worldwide health and living standards, but they would also contribute to global security by minimizing the causes of conflict and alleviating pressures forcing refugees to migrate to Canada and other countries.

CHAPTER 5:
THE PATH FORWARD

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The sustainability of our freshwater resources has become a national concern—from the emerging reality of water scarcity and the implications of a changing climate, to the pollution degrading our aquatic ecosystems and the unequal access to clean drinking water. Canadians expect the federal government to respond to these concerns and actively protect this most precious resource. Instead, they have witnessed declining interest and widening gaps in the federal capacity and willingness to act.

Changing the Flow:
A Blueprint for Federal Action on Freshwater

This blueprint represents a comprehensive plan that outlines priority actions to be adopted by our federal government. These actions would reinvigorate the federal role while respecting and enabling other levels of government and local actors to meet their own responsibilities and move us all towards a common freshwater vision. We urge our federal government to act on this plan and reverse the trend of the past twenty years.

To demonstrate commitment to protecting our freshwater legacy we expect the federal government to:

- **Require that a Parliamentary Committee respond to the actions established in this blueprint by generating an official report to be submitted to Parliament; and**
- **In the next federal government budget, commit sufficient resources to take action in the areas highlighted in this blueprint.**

As a group of concerned scientists and citizens, we recognize that broader civil society has a critical role to play in urging action by government. Therefore, we commit to:

- **Monitor the federal government's activities and keep Canadian citizens informed on their progress;**
- **Prepare and release follow-up reports until all priority areas are addressed; and**
- **Continue engaging in a dialogue with other groups and organizations to promote action towards a national water strategy and vision.**

Freshwater is critical to survival, vital for the national economy, and essential for a sustainable future. As a nation, it is time to stop taking water for granted, and time for our federal government to show leadership. Our national leaders can start by following the blueprint we have laid out in this document. The urgency for action mounts daily. The time for action is now.

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CHANGING THE FLOW:
A BLUEPRINT FOR FEDERAL ACTION ON FRESHWATER

Canada is a nation of freshwater lovers. Water supports our social fabric and it underpins our country's remarkable biodiversity. Many of us live along the shorelines of rivers or lakes. Millions rely on water to make a living. Water also provides a spiritual foundation and a sense of place, grounding us in our landscape. Spending time in, on, or close to water - swimming, fishing, skiing, and boating is for many of us what it means to be Canadian.

Yet citizens across the country, from coast to coast to coast, are noticing changes to this precious resource. Water shortages are becoming more common, mighty glaciers are disappearing and water pollution problems are persisting. The freshwater legacy we will leave for our children and grandchildren is in peril. Unfortunately, at the same time as the challenges facing our freshwater future are mounting, the commitment of our federal government to address freshwater challenges is considerably weaker than it was two decades ago.

The GORDON WATER GROUP OF CONCERNED SCIENTISTS AND CITIZENS, a group of scientists, lawyers, policy experts and former federal government policy advisors, are united by a shared concern for Canada's freshwater future. In *Changing the Flow, the Gordon* Water Group has established a comprehensive blueprint for federal action on freshwater protection. The twenty-five recommended actions built around seven priority areas are essential steps that would reignite the federal government's role in sustaining this most precious resource and help guide our nation to a sustainable freshwater future.

Gordon Water Group
of Concerned Scientists and Citizens

www.gordonwatergroup.ca