



Canadian Council of Ministers  
of the Environment    Le Conseil canadien  
des ministres  
de l'environnement

**SUMMARY OF INTEGRATED WATERSHED MANAGEMENT  
APPROACHES ACROSS CANADA**

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The Canadian Council of Ministers of the Environment (CCME) is the primary minister-led intergovernmental forum for collective action on environmental issues of national and international concern.

Integrated Watershed Management (IWM) is a continuous adaptive process of managing human activities and ecosystems at the watershed scale that integrates multiple concepts and methods, including water and land use planning and management (e.g., protected areas, source water protection, etc.), and evaluates and manages cumulative effects from multiple environmental stressors. IWM is intended to bring together many aspects of governance such as policy, planning and legislation on the basis of a geographic area (a watershed) and it also brings together people and their activities to build relationships among actors.

This summary report contains CCME's IWM definition and principles and describes Canadian jurisdictions' IWM concepts and approaches. It is designed to enhance the capacity of jurisdictions to apply integrated watershed management principles and to develop policies and programs consistent with the principles. Research support for this report was provided by Marbek Resource Consultants Ltd. In conducting this research a literature review was undertaken using primarily internet sources for publicly available government documents. Research also included telephone interviews and e-mail correspondence with representatives from Canada's 14 federal, provincial and territorial governments. The literature review, research and interviews were undertaken between January and September 2011. This report does not provide an assessment of the effectiveness, efficiency or success of any jurisdiction's IWM activities.

## 1.0 Strategic Vision for Water

In recognition of the importance of water to Canadians, CCME endorsed a *Strategic Vision for Water*. The first goal in the vision is for the protection of aquatic ecosystems on a sustainable watershed basis.

### Figure 1: Strategic Directions for Water: Vision, Mission and Goals

**Vision:** Canadians have access to clean, safe and sufficient water to meet their needs in ways that also maintain the integrity of ecosystems.

**Mission:** CCME facilitates forward-thinking research and integrated policy, standard and/or guideline development, that contribute to the sustainable management, protection, restoration and conservation of Canada's water.

**Goals:**

1. Aquatic ecosystems are protected on a sustainable watershed basis.
2. Conservation and wise use of water is promoted.
3. Water quality and water quantity management is improved, benefiting human and ecosystem health.
4. Climate change impacts are reduced through adaptive strategies.
5. Knowledge about Canada's water is developed and shared.

## 2.0 The Development of IWM in Canada

Canadians have had a long relationship with their watersheds. In many ways the development of an IWM approach in Canada is one of integrating the existing watershed management approach rather than newly creating it.

One cannot think of Canadian history without thinking about water and the role it played in the development of Canada; for example, Ontario and Québec's connections to the St. Lawrence River and the Great Lakes, or the relationship between Manitoba and the Red River and Lake Winnipeg.

In the early history of Canada, waterways were viewed as abundant resources that would advance the Canadian economy and society; little thought was given to the damage inflicted to the waterway. In the late 1800s severe water problems associated with flooding, drought and degraded water quality began to appear more regularly. People began to recognise these as the results of rapid land development (urbanization and deforestation) and that this was impacting economic growth and development. In the early 1900s legislators began to regulate water including permitting removals as well as permitting what wastes could be deposited into waterways. These efforts resulted in, for example, the Fisheries Act (1868), 1909 Boundary Waters Treaty between Canada and the United States, and the Grand River Conservation Commission (GRCC) in Ontario (1932). Some of this legislation (e.g., Boundary Waters Treaty, GRCC) stated that waters were to be managed at the watershed scale, which was the introduction of watershed management in Canada.

In the early days, watershed management in Canada focused primarily on flooding, drought and water quality (from a human health perspective) with the aim of being able to promote economic and social prosperity. As knowledge about the relationships between water, land, and prosperity increased, the approach to managing water resources shifted. Beginning in the 1970s, the impacts of land changes on erosion and stormwater began to be considered. Also, chemical contamination and aquatic habitat came under scrutiny as fish communities began to fail (e.g., 1972 Great Lakes Water Quality Agreement).

Throughout the 1990s, the list of concerns grew to include aquatic habitat, water temperatures, baseflow, riparian systems and natural infrastructure (wetlands, woodlots, wildlife habitat, etc.). As watershed management plans began to develop in the 1990s awareness increased of the need to integrate the different fields of study along with economic and social science components. As these plans progressed, scenario testing, information management and clear implementation strategies became more commonplace in the management process.

Even today, as knowledge about water's function within the environment, economy and society increases the complexity of integrated watershed management increases. The impacts of climate change, the need for social marketing, green infrastructure and more sustainable tools for watershed assessments are also now being considered. As IWM has become more complicated there is a need for jurisdictions to become more effective, to promote better governance in order to reflect shared responsibilities, and to ensure sustainable outcomes.

## *2.1 IWM in Canada Today*

While few Canadian jurisdictions have established clear mandates or departments to undertake IWM, many Canadian jurisdictions have informal IWM planning approaches and are working to continuously improve the plans developed. Some jurisdictions have scoped their approaches to target specific aspects of IWM, such as drinking water source protection.

Jurisdictions use a wide variety of governance approaches to IWM including grassroots, jurisdictional authority and combination approaches. Jurisdictions with IWM mandates commit a range of funding resources, staff expertise and guidance tools to work towards watershed plans including public engagement. Taking time for consultation, beginning early in the planning process, and continuing throughout the planning and implementation phases is highly recommended by jurisdictions and cited as a key factor in successful IWM framework development and implementation.

## **2.2 Drivers for IWM in Canada**

In the context of developed nations such as Canada, other more specific major factors that have influenced and continue to influence the development of IWM include:

- Recognition that environmental issues such as water are multi-scale. Individual activities in one area often have impacts that are felt in another area (e.g., jurisdiction, watershed, or downstream/upstream in the same watershed), and could additively and cumulatively have significant regional, Canada-wide, international or global impacts. Thus, jurisdictions within and between countries need to collaborate in identifying, avoiding, minimizing and mitigating these large-scale and often significant negative impacts.
- Recognition by federal, provincial and territorial governments, that it is neither desirable nor feasible to have a single “water agency” lead all water and land-related resource management. Thus, there is a need to bring together (or integrate) the efforts of several government agencies within and, where appropriate, between jurisdictions.
- Consideration of how water is connected through the hydrologic cycle, and groundwater and surface water must be connected in our management activities. This type of thinking also suggests that we should connect water resources, and the associated impacts on these resources from activities on land, to the ecosystems and to human health which rely on secure and safe water. Climate change reminds us that the water resources (water, ice and snow) and distributions of precipitation must not be taken for granted.
- Recognition of water shortages, flooding and water quality issues throughout the globe, including Canada (e.g., southern Saskatchewan, Red River, Saguenay River, Richelieu River, Walkerton, the Great Lakes and others).
- Consideration that increased water users and types of water use, including increased awareness of the need to better balance ecosystem needs and withdrawals, has led to more conflicts and more difficulty in achieving effective conflict resolution. IWM is seen as a way to better manage and resolve water use conflicts among various sectors (e.g., recreation, industries, agriculture, municipalities, energy production, etc.).

- Recognition of the need for participatory or community-based management approaches that could eliminate or reduce user conflicts, and provide a basis for better implementation. These approaches also serve as a way to ensure problems are well scoped and alternative solutions well considered.
- Awareness that funding for water resources management is limited and requires creative approaches to distribute the costs of planning, implementation and monitoring among the many participants including those who use and benefit from water.
- Awareness that climate change will alter what we have come to expect from “normal” climate conditions. Current thinking on IWM best practices recognises the high level of uncertainty associated with our ability to predict the future, and that we must be prepared for increased variability and change. Thus, adaptive approaches that rely on data collection, analysis and experimentation are a more recent aspect of IWM.
- Appreciation that Aboriginal people, living in parts of many watersheds throughout Canada, rely on many water resource services, and should be involved in the planning and management of those resources. Increased awareness of the relatively poor drinking water quality in many Aboriginal communities has led to a desire to redress this significant problem.

Since 1992, these factors have influenced the development and practice of many IWM initiatives in Canada.

### *2.3 Watersheds in Canada – The Challenge of Scale*

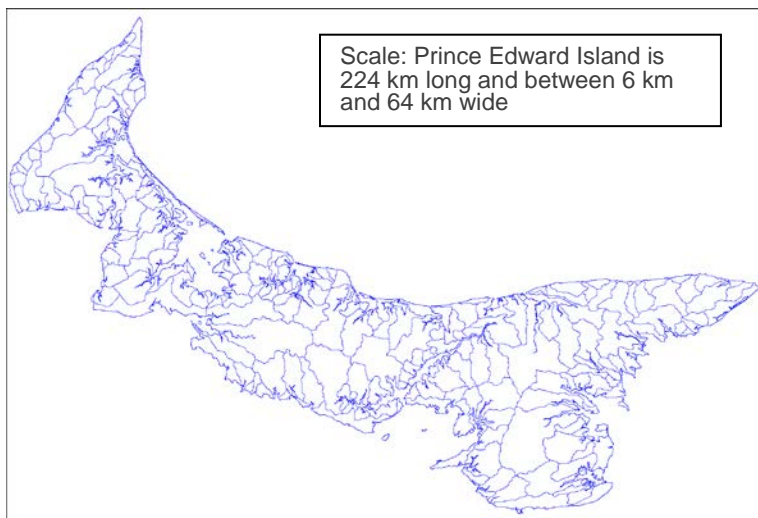
Canada is a very big country with very big watersheds (e.g., Great Lakes – St. Lawrence Basin); it is also a country of very small watersheds (e.g., those found on Prince Edward Island). How IWM is implemented across scale creates an interesting challenge for resource managers. The appropriate scale for IWM depends on the objectives, resources, capacity, leadership and jurisdiction of proponents for IWM. The objectives for IWM are related to existing conditions as well as desired future conditions in the watershed, stressors and drivers, socio-economic factors and other considerations unique to a region or jurisdiction. Each watershed is nested within a larger watershed, from the drainage area for a small headwater stream to continental scale basins. Figure 2 and Figure 3 illustrate the range of scales for North America and Prince Edward Island.

**Figure 2: North American Watersheds**



Source: Commission for Environmental Cooperation <http://www.cec.org>

**Figure 3: Prince Edward Island Watersheds**



Source: Government of Prince Edward Island. <http://www.gov.pe.ca/infopei/index.php3?number=40593&lang=E>

### 3.0 Definition and Principles of Integrated Watershed Management

As part of the initial research for this report, definitions used by Canadian jurisdictions for IWM and related terms were compiled, as were principles applied to IWM or closely related activities. The CCME definition and principles are as follows:

#### 3.1 Definition of Integrated Watershed Management

Integrated watershed management (IWM) is a continuous and adaptive process of managing human activities in an ecosystem, within a defined watershed. IWM involves the integration of environmental, social and economic decisions and activities through an inclusive decision making process to manage the protection, conservation, restoration and enhancement of aquatic and terrestrial ecosystem features, functions and linkages. Governance is a collaborative approach appropriate to the watershed and issues at hand.

#### 3.2 Principles of Integrated Watershed Management

1. **Geographical Scale:** The watershed should be the planning boundary for integrated watershed management, and should be at an appropriate scale to address the issues under consideration in a way that recognises its connectedness to upstream and downstream watersheds.
2. **Ecosystem Approach:** An interconnected process should be considered that uses best available knowledge, considers cumulative impacts, and promotes watershed and sub watershed approaches.
3. **Adaptive Management:** Flexible and continuous improvement and adaptation of approaches, policies and management should be undertaken by incorporating new knowledge and innovative design, practices and technology.
4. **Integrated Approach:** Land, water and infrastructure planning, investment and management should consider the direct, indirect or potential impacts and their interdependencies.
5. **Cumulative Impacts:** IWM planning should consider cumulative effects on the environment and the interdependency of air, land, water and living organisms.
6. **Precautionary Principle and No Regrets Actions:** Caution should be exercised to protect the environment when there is uncertainty about environmental risks.
7. **Proactive Approach:** Environmental degradation should be prevented. It is better for the environment and more cost-effective to prevent degradation of the environment than to clean it up after the fact.
8. **Shared Responsibility:** The responsibility for policy and program development and implementation should be shared within the mandate of all actors at the appropriate scale.
9. **Engaging Communities and Aboriginal Peoples:** IWM processes should recognize and duly support the identity, culture and interests of local communities and Aboriginal peoples. IWM processes should enable meaningful participation by local communities and Aboriginal peoples who have a vital role in IWM because of their knowledge and traditional practices.



10. **Sustainable Development:** The right to development should be fulfilled to equitably meet economic and societal needs while not compromising the environment for present and future generations.
11. **Natural Capital:** Natural capital should be protected and managed to reduce short- and long-term negative financial impacts. Natural systems provide goods and services of environmental, economic, social, cultural and spiritual value.

#### 4.0 Summary of Integrated Watershed Management in Canada

This section summarizes Canadian jurisdictions' IWM terminology and concepts, governance mechanisms, IWM approaches, implementation, monitoring and assessment.

##### 4.1 Common Terminology and Concepts

The following terms are used by one or more Canadian jurisdictions in an IWM or integrated water resources management context.

<b>Term</b>	<b>Jurisdictions Using the Term(s)</b>
IWM, integrated water resource management	All formally or informally except Yukon
Community-based watershed management	Prince Edward Island
Ecosystem-based management	All formally or informally
Adaptive management	All formally or informally; sometimes specifically used for climate change
Cumulative impacts or effects	All formally or informally
Ecological carrying capacity	Not used formally but terms with similar underlying concept are formally defined in some jurisdictions (e.g., Alberta, Ontario, Québec, British Columbia, Northwest Territories)
Co-management (in an IWM context)	Prince Edward Island, Québec, specific federal regulations or agreements (e.g., Mackenzie Valley Resource Management Act (federally administered))
Source water protection	All formally or informally

##### 4.2 Legislative Mandate and Authority for IWM

Given the complexities of IWM, it is not surprising that few jurisdictions in Canada have a clear mandate for IWM that spans departments or is supported by legislation or formal policy documentation. Many initiatives are focused on specific problems (e.g., drinking water source protection) or specific watersheds rather than embracing IWM broadly.

<b>Mandate type</b>	<b>Jurisdictions</b>
No mandate	Nunavut
Limited mandate	Newfoundland and Labrador, Nova Scotia, Ontario, Canada
Shared mandate with other organizations	Québec, Manitoba, Saskatchewan, Alberta, Northwest Territories
Informal mandate	Prince Edward Island
Alternative method	New Brunswick, British Columbia, Yukon

A formal IWM mandate can be defined by either legislation or a clear policy statement. In each case a formal mandate establishes a foundation for administrators to create organizational units, identify lead and participating agencies, identify budgetary allocations and other financial arrangements, as well as report on activities that fulfill the mandate. A clear mandate is fundamental to the success of IWM because it indicates the extent of political and senior leadership commitment to IWM and the ultimate authority (or authorities) of a jurisdiction to undertake IWM-related activities. Informal IWM mandates work but progress may rely disproportionately on the commitment of individuals within the organization to keep sufficient attention and resources available for effective IWM activities.

Jurisdictions without a formal mandate for IWM include Yukon and British Columbia. Yukon focuses on land use planning and integrated resource management (IRM), which includes water, but water is not the central aspect of the IRM plans. Similarly, British Columbia resource and land use planning has been driven primarily by forestry resources, of which water is an important aspect. In addition to land use planning, British Columbia supports a broad range of planning processes where water is a key management component (e.g., drought plans, source protection plans, drinking water protection plans). New Brunswick's *Clean Water Act* includes well field protection, watershed protection and water classification programs and so, through the *Clean Water Act* along with a Biodiversity Strategy, the province has assembled the foundation for an IWM approach.

Nova Scotia, Newfoundland and Labrador, and Ontario carefully limit the mandate and scope of their integrated watershed management objectives. Historically, Nova Scotia has identified drinking water source protection as the objective in IWM-related work, as has Newfoundland and Labrador. Ontario's Conservation Authorities have a long-established watershed planning mandate in the southern regions of the province and they support Ontario's drinking water source protection program and undertake other IWM activities. Ontario also undertakes other initiatives, for example as a partner in the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement. More recently, the province has proposed a Great Lakes Protection Act that, if passed, would help restore and protect the Great Lakes so they are drinkable, swimmable and fishable for present and future generations. This proposed enabling legislation, would among many other objectives, authorize the province to develop and implement geographically focused initiatives which could use an IWM approach to address particular Great Lakes problems.

Alberta, Saskatchewan, Manitoba, Northwest Territories and Québec share their IWM mandates with other organisations. Alberta has responsibility for approval and adoption of water management plans, as do other government, non-government and stakeholder organizations.

Saskatchewan has established a mandate for local implementation committees (called Watershed Authorities) to lead watershed or aquifer plan development through cooperative approaches. Manitoba has established a mandate for mandatory watershed planning through Conservation Districts. In Northwest Territories' specific legislations for an integrated system of land and water management defines shared responsibilities with land owners, governments, and institutions of public government for the Mackenzie River watershed. In Québec, integrated water resource management is the responsibility of 40 watershed organizations (OBV, the French acronym), and in the case of the St. Lawrence River, 12 regional consultation groups. These bodies have been mandated to produce, promote and monitor sustainable water resource development plans for their zones. The plans are approved by the Ministry of Sustainable Development, Environment, Wildlife and Parks. Integrated management of the St. Lawrence River involves a St. Lawrence forum, an annual meeting of stakeholders who have an interest in the river ecosystem.

Prince Edward Island does not have a formal mandate for IWM but it does fund plan development by local community groups and undertakes some capacity development activities to assist the local groups in developing plans. Watershed groups and projects that adopt a watershed approach to planning and management receive funding priority.

The federal government is responsible for inter-jurisdictional agreements, typically on a lake-basin level, with the United States. The agreements emphasize water quantity although some include a combination of quality, quantity and biodiversity issues. Canada also has authorities under the *Canada Water Act* for watersheds that cross provincial and territorial boundaries.

#### 4.3 Scale and transboundary watersheds

Scale Approach	Jurisdictions
Formal bilateral federal-provincial agreement	All
Formal Canada-United States agreement	Canada, Ontario, Manitoba
Formal provincial-state agreement	Ontario, Québec and eight U.S. states

Jurisdictions with transboundary watersheds have developed approaches and in some cases agreements with neighbouring jurisdictions, typically on a watershed and/or issue-specific basis. Agreements may include monitoring and data sharing. Transboundary watersheds are not necessarily larger spatially but are located straddling Canadian inter-jurisdictional or international boundaries.

The *Canada Water Act* (1985) is one example of legislation through which the federal government enters into water management agreements with the provinces. Examples of transboundary agreements include the Agreement Respecting Ottawa River Regulation (1983) between Canada, Ontario and Québec, Canada-Ontario Agreement Respecting the Great Lakes (2007), the Canada-Manitoba Agreement Respecting Lake Winnipeg and the Lake Winnipeg Basin (2010), Canada-Atlantic Agreement on Environmental Cooperation in Atlantic Canada (2008) and Canada-Québec Agreement on the St. Lawrence (2011). One of the federal government's responsibilities for water is assisting provinces wanting to manage interprovincial water resources. The Master Apportionment Agreement (1969) between Canada, Alberta,

Saskatchewan and Manitoba assists in working towards interprovincial cooperation regarding waters that flow east across the Prairies.

The Boundary Waters Treaty (1909) between Canada and the United States manages international transboundary water issues between the two countries. The International Joint Commission (IJC) was established under this treaty to help anticipate, prevent, and resolve water disputes over boundary and transboundary waters. The IJC serves as an independent advisor to the federal governments, typically addressing and recommending ways to resolve transboundary water issues through bilateral arrangements that often use existing mechanisms of the two countries.

Ontario and Québec along with the eight U.S. Great Lakes states signed the Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement created to protect, conserve and restore the waters of the Basin. The Agreement commits the signatory parties to: ban transfers of water out of the Basin and from one Great Lake watershed to another with strictly regulated exceptions; establish water conservation programs in each jurisdiction; use common standards for making decisions on proposed water uses; strengthen information and science to support sound decisions; and enhance regional oversight and collaboration.

Manitoba has a few watershed management plans for transboundary watersheds. These watershed plans were developed through stakeholder collaboration with members of the different jurisdictions. Manitoba implements actions within the Manitoba portion of the watersheds, as per the watershed plan. However, there is no mechanism to coordinate the actions of all jurisdictions to ensure inter-jurisdictional implementation of the plan. The Red River Basin Commission (RRBC) is a multi-stakeholder organization including board members from the states of Minnesota and North Dakota and the province of Manitoba. The RRBC has a mandate to initiate a grassroots effort to address land and water issues in a basin-wide context. Efforts are now underway to discuss how the Manitoba and Minnesota efforts can be complementary and expanded.

The Mackenzie River Basin, the largest river basin fully within Canada, spans Saskatchewan, Alberta, British Columbia, Yukon and Northwest Territories. The Mackenzie River Basin Transboundary Waters Master Agreement (1997) sets principles for inter-jurisdictional collaboration and establishes the Mackenzie River Basin Board. Jurisdictions within the basin are developing bilateral agreements based upon multilateral guidance.

#### *4.4 IWM Governance*

<b>Existence of IWM Governance Statutes</b>	<b>Jurisdictions</b>
Strong legislation	Manitoba, Québec, Ontario (south)
Enabling legislation	Saskatchewan, Ontario, British Columbia, Northwest Territories (federally administered), Canada
Enabling policy	Newfoundland, Nova Scotia, Québec, Alberta, Northwest Territories
Planning guide	Prince Edward Island

Under development	New Brunswick
No statutes	Yukon
<hr/>	
<b>Existence of Water Resource Management Statutes</b>	<b>Jurisdictions</b>
Enabling Legislation	All

Over the last 40 years Canadian water governance has evolved from the domain of governments and industry to the current period of government agencies playing a fundamental role but including a broader range of actors including non-governmental organizations and the public.

Over that same timeframe, statutes have been introduced in all jurisdictions that provide or enhance IWM mandates, set goals/objectives and funding arrangements, and/or create the government agencies required to oversee this work. Funding for water resources management, particularly in the recent past, has become much more constrained and ‘user pay’ approaches have become more widely accepted and applied.

All Canadian jurisdictions have a number of statutes addressing specific aspects of water resources management but jurisdictions typically do not have a focused piece of strong legislation in place to manage water issues on a watershed basis. As exceptions, Manitoba’s *Water Protection Act* and Québec’s *Water Act* provide strong legislative support for water resource management, including watershed planning.

The UNDP defines water governance as

*“The political, social, economic and administrative systems that are in place and which directly or indirectly affect the use, development and management of water resources and the delivery of water service delivery at different levels of society. Importantly, the water sector is a part of broader social, political and economic developments and is thus also affected by decisions outside of the water sector.”*

Source: [www.watergovernance.org](http://www.watergovernance.org)

The *Saskatchewan Watershed Authority Act* enables Watershed Authorities to protect water, watersheds and land resources through promotion of efficient use and coordination of activities related to water, water quality and related land decisions; Saskatchewan’s Watershed Authorities have no legislative authority.

Ontario’s *Conservation Authorities Act*, originally passed in 1946, delegates some of Ontario’s watershed level decision-making regarding natural resource management to Conservation Authorities within the southern portion of the province and some areas in the north. Examples of delegated watershed decision-making include managing rivers, lakes and streams, and other natural heritage, and protecting life and property from natural hazards such as flooding, drought and erosion. In addition, the *Clean Water Act* (2006) of Ontario establishes mandatory planning requirements for designated drinking water source protection areas. The governance for source water protection in Ontario is complex, with the Crown approving protection plans developed by multi-stakeholder committees (that include municipalities). The committees are overseen and supported by Conservation Authorities. Other statutes in Ontario such as the *Lake Simcoe Protection Act* (2008) also provide a legislated framework for IWM, however these Acts are geographically limited to the watershed/area of interest.

British Columbia's *Water Stewardship Division Strategic Plan* (2008) incorporates the theme of IWM and resource plans incorporate IWM to varying degrees in the province. *Living Water Smart: British Columbia's Water Plan* is the government's vision and commitment to ensuring healthy and secure waterways and water resources. Legislative proposals under British Columbia's *Water Act* modernization are currently being developed to support and promote IWM. For example, Regional Growth Strategies (RGS) under the *Local Government Act* are initiated, prepared and enacted by a regional district, with the full involvement of its member municipalities, provincial agencies and others. While the content of RGS will vary regionally, they should consider IWM principles, e.g., integrated approach and shared responsibility.

Northwest Territories has strong IWM legislation through the federal *Mackenzie Valley Resource Management Act* (MVRMA) that provides for an integrated system of land and water management in the Mackenzie Valley and ties together land use planning, land and water regulation, environmental impact assessment, and cumulative effects management. Several jurisdictional authorities, such as land and water boards and planning boards, are created and linked through this legislation. However no clear mandate exists on specific roles to implement IWM. The *NWT Waters Act*, an Act respecting water resources in Northwest Territories, ties together water use and the deposit of waste and provides for regulations that establish water management areas consisting of river basins or other geographical areas.

The federal government's *Federal Water Policy* (1987) includes "Integrated Planning" as a key strategy. There are many pieces of federal legislation that govern various aspects of water management, including sector-specific activities. Among these are the *Canada Water Act*, *Fisheries Act*, *Boundary Waters Treaty Act*, and the *Canadian Environmental Protection Act*.

Alberta, Québec, Nova Scotia, Newfoundland and Labrador and Northwest Territories have policy documents that provide the governance framework for water and that encourage an integrated approach.

Alberta's *Water for Life Strategy* (2008) and *Action Plan* (2009) outline outcomes, key directions, and specific actions for managing Alberta's water needs, while maintaining economic prosperity and addressing environmental concerns.

Québec's *Water Act* establishes a framework for watershed planning and enables Watershed Agreements that require Master Plans be developed for each identified watershed. The Agreements do not create legal obligations but instead rely on voluntary signatories to the agreements to implement the measures.

Nova Scotia's *Water for Life: Nova Scotia's Water Resource Management Strategy* makes a commitment to IWM and recommends it as an approach. Nova Scotia has focused on source water protection of municipal drinking water supplies. Municipalities are required under the *Municipal Water Approvals and Renewal Initiative* and the *Drinking Water Strategy of Nova Scotia* to develop and implement source water protection plans. No enforcement mechanism exists requiring municipalities to adopt an IWM approach for the source water protection plans.

Newfoundland and Labrador's *Management of Protected Water Supply Areas* policy states that municipalities are responsible for water management to protect drinking water supplies;

municipalities are encouraged to develop plans but there is no legislative requirement that they do so.

Northwest Territories’ *Northern Voices, Northern Waters: NWT Water Stewardship Strategy* and its associated Action Plan form a comprehensive water resources policy base. The Strategy highlights three grounding approaches: an ecosystem-based approach within watersheds; water and watershed values; and “information to understanding” in a decision-making cycle. Drinking water source protection plans and community-based monitoring are key program aspects underway.

*A Guide to Watershed Management Planning on Prince Edward Island* identifies recommended watershed plan elements for the province; Prince Edward Island is currently developing a strategy to guide the watershed program on the Island in collaboration with the Watershed Alliance. Prince Edward Island has no plans to create mandatory requirements but does encourage best practices through its third-party funding allocations.

New Brunswick is planning to develop a Water Management Strategy, the need for which was identified under the province’s *Climate Change Action Plan*. New Brunswick currently relies on a suite of statutes and regulations to manage water resources.

The Yukon Water Board was established under Yukon’s *Waters Act* but there is no mandate for IWM within the territory and Integrated Resource Management is undertaken through voluntary measures.

#### 4.5 Governance: Decision-making Roles and Stakeholder Involvement

<b>Decision-making Roles and Stakeholder Involvement Approach</b>	<b>Jurisdictions</b>
Combination centralized and watershed-based	Ontario, Québec, Nova Scotia, Newfoundland and Labrador, Canada, Northwest Territories
Centralized, bottom-up approach	Manitoba, Prince Edward Island
Watershed-based organization	Saskatchewan
Issue-specific approach	Alberta
Non-specific approach or range of approaches	New Brunswick, British Columbia

Governance approaches used by Canadian jurisdictions are typically a combination of jurisdictional authority (top-down) and grassroots (bottom-up) approaches. Stakeholder involvement within jurisdictions can entail the appointment of stakeholder representatives from groups (e.g., NGOs, private sector) that are seen to be credible and/or important to water issues. This approach expects these representatives to bring the views of the group they represent (as opposed to personal views) to the table and report back to their group. In some cases, stakeholder involvement is achieved through informal engagement on an issue or project basis (e.g., a public meeting). Like IWM itself, there is no single perfect approach to achieve effective stakeholder involvement.

Ontario’s approach to drinking water source protection is driven as a top-down process but the general watershed management process is implemented from the bottom-up or in combination

with the province. Under the *Clean Water Act*, Conservation Authorities and appointed Source Protection Committee members from municipal governments, NGOs, Aboriginal representatives and the general public are tasked with developing technical assessment reports. The reports identify risks to municipal water supplies and source protection plans that will mitigate those risks. Outside of areas where Conservation Authorities have jurisdiction for watershed planning, local decision-makers may undertake watershed planning guided by provincial direction.

Québec's approach of management through watershed roundtables results in a combination top-down/grassroots approach since planning agencies are represented at the table. The multi-party roundtables promote the exchange of knowledge and build relationships among watershed stakeholders with the goal of developing a common understanding of aquatic resource management issues.

Nova Scotia has a combination approach of top-down and bottom-up for source water protection (SWP). SWP plans are a regulatory requirement of municipal drinking water supplies. The way the plans are developed is flexible. Each municipality has flexibility to develop plans in a way that suits their system, community, risks, etc. The province encourages municipalities to engage stakeholders in SWP through the formation of a SWP Committee by each municipality.

In Newfoundland and Labrador, the governance approach is top-down with watershed committees providing input through consultation to the government as the decision-making body.

The federal government's approach for IWM tends to be top-down for Canada-U.S. transboundary watersheds. Otherwise, the approach may be collaborative or bottom-up.

In Northwest Territories and Nunavut the governance approach is defined through negotiated agreements with Aboriginal governments. Institutions of government and co-management boards and agencies are formed to provide for collaboration and public input. In Northwest Territories community and regional input is emphasized. This emphasis is promoted or supported by several orders of government, including the federal departments of the Environment, Fisheries and Oceans, and Aboriginal Affairs and Northern Development, as well as the Government of Northwest Territories.

In Manitoba and Prince Edward Island, the governance approach to developing plans is bottom-up, with participation and collaboration with stakeholders at the local order of government to develop plans.

In Saskatchewan, citizen involvement is encouraged through stakeholder participation and Watershed Association board membership; the executive director of the watershed boards is the key decision-maker.

In Alberta, the planning framework for IWM does not include a formal detailed public consultation process but citizens are engaged on an issue-specific basis. Key partners including the Alberta Water Council, Watershed Planning and Advisory Councils and community-based water stewardship groups play roles in establishing goals and priorities in Alberta's watershed planning process.



New Brunswick’s watershed management approach is informal and thus cannot be characterized in terms of bottom-up or top-down.

British Columbia has historically had a centralized, top-down approach to water management. However, currently a range of approaches are undertaken. In particular where community and watershed groups have undertaken initiatives for watershed management, the recommendations or activities are incorporated into local and regional plans to the extent possible or necessary.

#### 4.6 Governance: Decision-Making Roles with Aboriginal Canadians

<b>Aboriginal Engagement and Involvement Approach</b>	<b>Jurisdictions</b>
Formally incorporated into policy or legislation	Canada, Québec, Saskatchewan, Northwest Territories, Yukon
Policy development in progress	New Brunswick, Manitoba
Geographically-based policy	Ontario
Informally incorporated	Newfoundland and Labrador, Nova Scotia, Prince Edward Island, Manitoba, Alberta, British Columbia

Aboriginal engagement is formally incorporated into governance approaches in the federal, Saskatchewan, Québec, Northwest Territories and Yukon jurisdictions. Governments have an obligation to take treaty and Aboriginal rights into consideration and a duty to consult.

In Northwest Territories, Aboriginal governments and Aboriginal people are primary participants in IWM management. Stemming from comprehensive land and resources agreements, the MVRMA creates an integrated system that operates through land and water boards, with members from Aboriginal, territorial and federal governments. Both the MVRMA and the Mackenzie River Basin Transboundary Waters Master Agreement acknowledge and call for the use of traditional knowledge in planning, assessment and management of both land and water. The Government of Northwest Territories has had a traditional knowledge policy since 1997 that recognizes Aboriginal traditional knowledge as a valid and essential source of information about the natural environment and its resources, the use of natural resources, and the relationship of people to the land and to each other. The overarching *Northern Voices, Northern Waters: NWT Water Stewardship Strategy* and the associated action plan were the result of collaboration and input from Aboriginal leaders, communities, governments, regulatory boards, environmental non-government organisations. The Strategy emphasizes the importance that all water partners work together to make sound decisions about water. Currently, community-based monitoring initiatives are underway in several communities. These community-based monitoring initiatives seek to support communities to address their aquatic ecosystem-related concerns about water, through state of the knowledge reporting, vulnerability assessments, and research and monitoring, particularly in areas where transboundary concerns have been expressed.

In Yukon, governance of water and rules regarding water management and engagement with Yukon First Nations are established in the First Nation Final Agreements. Eleven of 14 Yukon First Nations have settled their land claims through a system of land and water boards

established through comprehensive land and resources agreements and overarching legislation. Similarly, the Gwich'in Tribal Council Yukon Transboundary Agreement establishes water rights in the Tetlit Gwich'in First Nation Primary and Secondary Use areas. The governance of water under the Inuvialuit Final Agreement applies to the Yukon North Slope.

Watershed organizations in Québec must reserve a seat for an Aboriginal person living within the watershed. Before being finalized, Master Plans for Water in Québec (akin to watershed management plans) must be submitted to Aboriginal communities for comment and consultation.

The *Saskatchewan Watershed and Aquifer Planning Model* states that watershed plans should be comprised of background information that includes Aboriginal knowledge. In practice, the Saskatchewan Watershed Authority (SWA) appeals to Aboriginal communities to participate in the planning process and if gaps are identified in the diversification of stakeholders, SWA initiates more targeted invitations.

New Brunswick is working towards a formalized process for inclusion of traditional knowledge. Similarly, in Manitoba, the inclusion of traditional knowledge and/or local knowledge is an element that Manitoba Water Stewardship is actively pursuing. Since Aboriginal representatives do not typically participate as part of Water Planning Authorities, one technique Manitoba uses that has successfully gathered important information is to host planning meetings in Aboriginal communities with maps and visual tools to enable knowledge sharing.

Ontario is working on developing strong collaborative relationships with Aboriginal communities. For example, Ontario includes consideration of Aboriginal traditional knowledge in Far North community-based land use planning, in the source protection planning process established under the *Clean Water Act*, the Lake Simcoe Protection Plan and other initiatives, such as those related to Great Lakes protection. In addition, under the *Clean Water Act*, First Nations may participate on Source Protection Committees. When there is a reserve in the Source Protection Area and a First Nations drinking water system these can be included in the *Clean Water Act* source protection planning process, when endorsed by band council resolution and through the passing of a provincial regulation.

Other jurisdictions incorporate traditional knowledge through informal methods and Aboriginal input is encouraged but not formally included in IWM plan development.

#### 4.7 Structure and Planning Approaches

<b>Structure and Planning Approaches</b>	<b>Jurisdictions</b>
Formal watershed-level approach to planning within a jurisdiction	Nova Scotia, Prince Edward Island, Québec, Ontario (Southern), Manitoba, Saskatchewan, Alberta
No formal approach	Canada, Newfoundland and Labrador, British Columbia, Yukon
Other planning-scale approach	Northwest Territories

The shared nature of water resources management in Canada has resulted in a complex management structure comprised of multiple levels of government, often several departments within a government, as well as a host of other actors.

Federal, British Columbia and Yukon jurisdictions have no specific structure or planning approach. In British Columbia, strategic planning has typically been driven by forestry with water and watershed management being elements of plans. Yukon does not have a watershed-based approach. There is also no specific IWM planning or approach at the federal order of government.

Alberta has established Watershed Planning and Advisory Councils (WPACs) and provides funding to support State of the Watershed Reports and IWM plans. Once WPACs are established, the first step is to undertake a State of the Watershed Report. The scope and scale of the reports varies depending on watershed size and data availability.

In Saskatchewan, the Saskatchewan Association of Watersheds is an umbrella organization for the Watershed Associations (WAs). WAs were formed by watershed stewardship groups to develop watershed plans. WAs are non-governmental organizations that receive funding from the Saskatchewan government for education, awareness and coordination of program delivery. The planning approach begins with solicitation of issues from stakeholders and prioritizing them.

Manitoba implements IWM through Conservation Districts in a process that takes one to two years and is subject to review every eight to ten years. A Watershed Planning Authority (WPA) takes responsibility to develop an IWM plan in accordance with Manitoba's *Water Protection Act*. Watershed teams comprised of diverse stakeholder groups commit to provide technical information about the watershed and to meet three to four times during a plan's development. The province's Water Stewardship Fund, administered by the Minister of Finance, supports research, implementation and other management for water quality purposes advised by the Lieutenant Governor in Council. Manitoba has established a Conservation Districts Commission, comprised of representatives from six provincial departments, a municipal organization, a conservation district association and two public appointees to oversee watershed planning on a conservation district basis.

Ontario's Conservation Authorities deliver watershed-based programs for member municipalities including review of and comment on growth and development plans, zoning and bylaws, from the perspective of the watersheds. Under the *Clean Water Act*, Conservation Authorities are also the responsible agencies supporting the local multi-stakeholder committees carrying out the provincial source water protection program, primarily in the southern portion of the province. The planning approach for source water protection is risk-based with a view to protecting human health.

Québec has established IWM zones in the southern part of the province through *Organismes de bassins versants* (OBV) with an umbrella agency, the *Regroupement des organismes de bassin versant* (ROBVQ), which is a non-profit organization that represents 40 watershed organizations in the province. The 2011-2026 St. Lawrence Action Plan calls for the creation of 12 regional consultation groups whose mission will be similar to that of the watershed management groups

(OBV). In this instance, the designated areas are the shores of the St. Lawrence River, the Saguenay River and the St. Lawrence islands (river, estuary and gulf).

Prince Edward Island has 26 community-based watershed groups that originally were typically focused on stream enhancement projects. The province created a watershed management fund to encourage the groups to engage in watershed planning activities. Some mergers have occurred, encouraged by the province, in order to maximize efficiency of the watershed groups. One challenge for Prince Edward Island in watershed management is that municipal governments do not cover the extent of the Island (and there are no county governments) so there is no intermediate order of government for implementation of land use policies. Each watershed group identifies priorities based on its assessment of the issues facing their watershed. A similar approach is undertaken in New Brunswick with watershed based groups, coordinated through the Department of Environment and Local Government and supported via the New Brunswick Environmental Trust Fund.

Nova Scotia has a senior-level interdepartmental committee to oversee the implementation of the Strategy and three program-level interdepartmental committees to generate cross-departmental collaboration. As well, Nova Scotia has brought together a group of external stakeholders such as academics and industry representatives (the Water Advisory Group) to provide advice and expertise to government on implementing the Water Strategy. Municipalities are responsible to develop source water protection plans and they are encouraged to involve stakeholders and to take an IWM approach.

Newfoundland and Labrador encourages development of drinking water source protection committees. Municipalities are responsible to apply to form watershed protection committees and to fund plan development. Plans may also be funded by non-governmental organizations. The source water protection approach is risk-based to protect human health.

Since the continental Northwest Territories falls almost entirely within the Mackenzie River Basin, the scale of IWM would need to be at a sub-basin level. Aboriginal comprehensive land, resources and self-government agreements define land use planning scales. However within those regions, though attention is being paid to watersheds, no formal watershed committees have yet been established aside from the Peel Watershed Planning Commission (based in the Yukon) with membership that includes the Gwich'in of Northwest Territories. The Yukon-Northwest Territories Bilateral Agreement, borne of the Mackenzie River Basin Transboundary Waters Master Agreement, is funded through a shared contribution agreement of the Mackenzie River Basin Board. Jurisdictions within the Mackenzie River Basin contribute to Environment Canada using a prescribed formula in order to fund the operations of the Mackenzie River Basin Board.

#### *4.8 Monitoring and Data Management*

<b>Monitoring and Data Management Approach</b>	<b>Jurisdictions</b>
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Monitoring that takes place over various spatial and temporal scales is important to IWM and is a significant challenge in many jurisdictions. Most jurisdictions' monitoring systems can detect outputs such as the number of trees planted or length of riparian habitat restored. However, environmental outcomes, such as changes in fish and wildlife populations and/or water quality, are often not monitored or adequately assessed to determine whether ecological changes have occurred. Significant scientific gaps in cause-and-effect relationships exacerbate this gap between monitoring and evaluation of ecological outcomes. This problem in monitoring also highlights the need to recognize the importance of a nested or linked approach within a watershed or connected watersheds in order to identify the impacts of actions/activities taken outside of the watershed of interest.

To encourage data exchange, some jurisdictions are in the process of developing centralized information databases for watershed monitoring data. For instance, Alberta and Québec are each developing a Water Portal and Nova Scotia is developing a Water Geodatabase. New Brunswick continues to bolster its efforts with the Canadian Rivers Institute to modernize and further developing its Aquatic Data Warehouse (NBWaters). The Federal government has an open data portal that allows access to data on water quality and availability. As well the federally coordinated Canadian Aquatic Biomonitoring Network (CABIN) and the National Hydrometric Network have tools to allow users to access datasets maintained by the federal government.

Ontario's Ministry of Natural Resources manages Land Information Ontario and the Ministry of Environment has several long-standing monitoring networks such as the Provincial Water Quality Monitoring Network (over 40 years), the Dorset Environmental Science Centre (monitoring lakes and streams in south-central Ontario for over 30 years). More recently, the Ministry of the Environment established a water-taking reporting system which tracks water takings in the province. The Ministry's databases are connected to an internal GIS Portal, also accessible by Conservation Authorities, that includes water quality data and addresses water programs and issues.

British Columbia has an Environmental Monitoring System Web Reporting (EMS WR) application that allows authorized users to access information stored in the EMS database, including:

- physical, chemical, and biological test results for analyses performed on air, water, solid waste discharge, and ambient monitoring locations throughout British Columbia
- drinking water test results on samples collected by water purveyors and health authorities
- bacteriological and pool/hot tub water test results.

Northwest Territories is developing a multi-layered NWT Spatial Data Warehouse that identifies both GIS and reports available in particular regions of Northwest Territories, including watersheds. Community water supply watersheds are mapped for every community. As well, the a NWT Water Portal is under development.

## 4.9 Evaluation and Reporting

<b>Evaluation and Reporting Approach</b>	<b>Jurisdictions</b>
Performance measures in place	Canada, Ontario, Manitoba, Saskatchewan, New Brunswick

Establishing benchmarks for IWM and collecting robust data for evaluation against the benchmarks were also identified as challenges. Few jurisdictions formally evaluate IWM using a comprehensive suite of performance-based indicators that are monitored on a watershed-basis. As part of an evaluation approach, many of the monitoring systems in place can be characterized as detecting change from ambient conditions rather than programs to evaluate progress relative to established goals.

Through the federal Canadian Environmental Sustainability Indicators (CESI) initiative, the federal government reports on environmental indicators that track the long-term trends for issues such as land use, wastewater treatment, water use, water quality and water availability.

Several of Ontario's Conservation Authorities have developed Watershed Report Cards. These report cards are a means of collecting and reporting on surface water quality, forest conditions and groundwater, and provide a summary of key watershed features and actions undertaken locally. Ontario's key provincial land use plans (e.g., Greenbelt Plan, Oak Ridges Moraine Conservation Plan, Growth Plan for the Greater Golden Horseshoe, and Provincial Policy Statement) contain requirements for performance measurement to evaluate the effectiveness of the land use planning policies.

In Manitoba, the development and effective use of IWM plans and Conservation District governance is evaluated through a reporting table that tracks three groups of metrics: watershed management; citizen engagement; and integrated watershed management planning and implementation. Qualitative scores are assigned to each metric and they are summed to arrive at a final indicator value.

The Saskatchewan Watershed Authority released its second State of the Watershed Report on March 29, 2010. The State of the Watershed Report is a benchmark tool for assessing watershed health. It is based on a stress-condition-response model, and uses indicator-based assessments to rate watershed health, environmental stressors and management responses. The report includes 41 indicators to assess the current health of Saskatchewan's watersheds, provide information about human activities that impact the environment within watersheds, and evaluate the effectiveness of the management activities. All of this information is presented in a comprehensive report card format that is easy to understand.

New Brunswick produces a yearly State of Environment (SOE) Air Report and continues to evaluate an overarching SOE Reporting Framework approach.

#### 4.10 Cumulative Effects Assessment

##### **Cumulative Effects Assessment and Management Approach**

##### **Jurisdictions**

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Under development

Canada, Ontario, Québec, Alberta, British Columbia, Northwest Territories

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With the recognition of a need to manage water on a watershed basis, there has also been recognition of the need to assess the impacts of multiple changes within watersheds, including concurrent projects and impacts from past activities. The assessment of cumulative effects was identified as problematic due to insufficient data and a lack of methodologies to assess cumulative effects. Climate change introduces additional complexity that needs to be incorporated into assessment and management of cumulative impacts. This is an element of IWM that requires further study.

Alberta is managing cumulative effects at the regional level. As the first regional plan under Alberta's Land-use Framework, the Lower Athabasca Regional Plan identifies and sets resource and environmental management outcomes for air, land, water and biodiversity, and guides future resource decisions while considering social and economic impacts. The plan is a blueprint to manage a renewed economic boom in northeast Alberta, support communities and maintain a healthy environment.

Alberta Environment and Sustainable Resource Development's role in managing cumulative effects in the region is detailed in management frameworks. Three management frameworks have been drafted for the Lower Athabasca Regional Plan: an air quality management framework, a surface water quality management framework, and a groundwater management framework.

The federal *Mackenzie Valley Resource Management Act* (1998) for Northwest Territories highlights the need to ensure a comprehensive approach to cumulative effects. Part 6 calls for analysis of data, traditional knowledge and other pertinent information for the purpose of monitoring the cumulative impact on the environment of concurrent and sequential uses of land and water and deposits of waste in the Mackenzie Valley. Through a federally-led partnership program, strategic planning is underway in 2011-2012. Recent discussions highlight the need to consider a watershed approach, given the significant cultural values associated with water in Northwest Territories.

Cumulative effects in British Columbia is defined as "changes to environmental, social, and economic values caused by the combined effect of present, past, and reasonably foreseeable future actions or events on the land base." The cumulative effects approach that will be applied in British Columbia will assess the effects of projects using a common set of environmental, social and economic values at the region or watershed level and at the project level. Monitoring will be undertaken to ensure complete, consistent and up-to-date information which builds upon best available information and protocols. A mitigation strategy is also being developed to support management of any cumulative effects.

Environment Canada's Science Plan identifies understanding cumulative risks as a strategic goal. To that end, EC has committed to developing tools to assess cumulative impacts and to undertaking research to better understand the impacts. From a legislative point of view, the *Canadian Environmental Assessment Act* (CEAA) requires consideration of cumulative effects and provides practitioners with guidance on applying these considerations.

## **5.0 Advancing IWM in Canada – from Approach to Implementation**

There are many challenges associated with advancing IWM in Canada including: the scope to which it is applied; how to secure an effective, efficient and fair form of governance structure; and how to resource implementation in general. The degree of these challenges and the way in which they are dealt with varies from jurisdiction to jurisdiction.

### *5.1 Scope*

Jurisdictions generally scope and tailor their approach to water resource management on the basis of risk management, resourcing and organizational capacity. Drinking water source protection is commonly a high jurisdictional priority. Where authority for issue identification is delegated to watershed organizations, issues identified vary in accordance with local priorities and the capacity of each organization.

### *5.2 Governance Structure*

Jurisdictions with watershed organizations that undertake IWM find the quality of the resulting plans to be variable, depending on the talents and resources available for the plan. To build capacity and to create baseline requirements for plans, many jurisdictions have developed guidance documents for IWM/water resource management plans. Alberta has developed *The Handbook for State of the Watershed Reporting: A Guide for Developing State of the Watershed Reports in Alberta* (2008) to guide State of the Watershed reports across the province. The handbook focuses primarily on measures of a watershed's environmental condition. The Québec government published a guide for watershed organizations to develop Master Plans for Water (watershed management plans). In Saskatchewan, the Watershed and Aquifer Planning Model was developed as a tool to guide the watershed planning process. Given that the nine plans published to date differ in focus and scope, the Saskatchewan Watershed Authority (SWA) is in the process of revising this model to reflect the broader integrated nature of more recent plans and to define a protocol for developing IWM plans with actions and stakeholder roles. In addition, SWA is building a plan review template in order to update past plans so they are in line with more recent IWM content. The Ontario Conservation Authorities have a watershed management framework that can be adapted for any watershed, subwatershed or tributary. This framework can also be used for environmental site planning processes.

Prince Edward Island has also experienced high variability in the content and quality of plans. To assist in community-based plan development, the province has developed a Report on the Public Consultations on Managing Land and Water on a Watershed Basis and a Guide to Watershed Planning on Prince Edward Island. Manitoba has developed an approach it calls 'plan on a page' which comprises a one or two page summary of a watershed plan with a timeline, goals and



priority zones depicted. In order to maintain flexibility to adapt each plan to the watershed's culture, Manitoba does not require the use of a standardized template.

Ontario has a *Lake Simcoe Protection Act* and Lake Simcoe Protection Plan which takes an IWM approach. This plan is guided by many stakeholders, including Conservation Authorities, as well as Aboriginal Communities and has established a Science Committee and a Coordinating Committee. Key initiatives for Lake Simcoe include the development of a Phosphorus Reduction Strategy, investigation into innovative approaches such as water quality trading, stormwater master planning, shoreline development and a climate change strategy.

In 2001, Conservation Ontario and the Ontario Ministries of Natural Resources and Environment partnered to develop a series of watershed-based pilot projects focusing on: (i) new and innovative approaches to watershed stewardship, and, (ii) objectives to develop, implement and demonstrate place-based environmental management approaches. In 2010, Conservation Ontario, with assistance from the Ontario Ministries of Natural Resources and Environment and Fisheries and Oceans Canada released three main documents (plus a summary report) entitled "Integrated Watershed Management: Navigating Ontario's Future". This research initiative enables the categorization of a set of tools that could be applied to Ontario for planning and decision-making. Conservation Ontario has also undertaken a number of Watershed Management Pilot Projects with financial assistance from the province. The Ontario government also published documents in 1993 and 1997 on watershed management in the province. Finally, under the *Clean Water Act*, Source Protection Committees provided source protection plans to the Ministry of the Environment for approval by August 2012. Once the plans are submitted and approved, a variety of bodies will become responsible for implementation of the plans, including municipalities, Conservation Authorities and provincial ministries.

British Columbia's Living Water Smart includes 45 commitments and actions to be undertaken by the government, including updating the *Water Act* in the province. The proposed *Water Sustainability Act* is being prepared to meet four primary goals which stem from Living Water Smart: protecting stream health and aquatic environments; regulating groundwater use; introducing more flexibility and efficiency in the water allocation system; and improving water governance.

In Northwest Territories a comprehensive approach to watershed management is fundamental to the recent *NWT Water Stewardship Strategy and Action Plan*. A multi-partner effort is required to implement the principles and actions called for in the plan. Joint Aboriginal government, federal government and territorial government decision-making is formalized through institutions of public government for land and water management as well as land use planning. Informally, an Aboriginal Steering Committee brings regional interests to the table so that within Northwest Territories those within the Mackenzie River Basin can learn from each other and help shape actions collectively. Though it is challenging to integrate IWM values into decisions made regarding development throughout Northwest Territories or in neighbouring upstream jurisdictions, regional land and water boards and the Mackenzie River Basin Board are venues to do so. Annual board forums are a venue to discuss these matters between boards.

### 5.3 Resourcing

The following discussion presents examples of how IWM is being resourced in various jurisdictions. This is by no means an exhaustive discussion.

Six provincial jurisdictions (Alberta, Saskatchewan, Manitoba, Ontario for source water protection, Québec and Prince Edward Island) allocate provincial funding to third-party organizations for watershed-based planning.

Alberta provides funding in two portions: operational funds to pay staff, office space and operations in the first instance; and project funds to pay for State of the Watershed reports, planning and implementation in the second.

Saskatchewan relies on several revenue sources including general revenue, water rental charges through the *Water Power Act*, industrial water use charges, and contracts with other agencies, among other sources. This core funding is contingent on hiring of a watershed manager/coordinator and office space. Saskatchewan encourages watershed stewardship organizations to officially obtain Watershed Association status to deliver watershed plans.

In Manitoba, the Watershed Stewardship Fund is cost-shared between the provincial government and municipal governments.

Ontario's Conservation Authorities' IWM work under the *Conservation Authorities Act* is funded largely through municipal tax-levies whereas the drinking water source protection planning work undertaken under the *Clean Water Act* has been funded one hundred percent to date by the provincial government (>\$200 million since 2004/05). There is also a stewardship fund enshrined in legislation to provide financial assistance to those whose activities or properties are affected by the Act. Ontario also provides dedicated staff resources and funding tied to implementation of its Lake Simcoe Protection Plan and has several resources available (e.g., guides to implement an ecosystem approach) to assist with integrated watershed management.

Québec provided about \$65,000 per watershed organization per year from 2001 to 2008. In 2009, the amount increased to up to \$126,000 per watershed organization, depending on population and watershed size.

Prince Edward Island provides \$920,000 per year in funds and staffing support to watershed groups for watershed management, planning and restoration activities.

Collectively, Canada, British Columbia, Saskatchewan, Alberta, Yukon, and Northwest Territories contribute to fund the Mackenzie River Basin Board's operations at about \$280,000 annually.

In New Brunswick, no funding is provided to watershed groups. However, third party organizations can obtain funding through a provincial Environment Trust Fund and other sources. Nova Scotia does not provide direct funding for IWM however there are two watershed planners that are currently dedicated to assist municipal source water protection efforts and other

capacity development assistance is provided. Newfoundland and Labrador does not provide funding for IWM. British Columbia and Yukon do not use the IWM model.

The federal government provides financial support to community-based and non-profit organizations for work that protects, rehabilitates or enhances the natural environment through various programs such as Environment Canada's EcoAction Community Funding Program, the Lake Winnipeg Stewardship Fund, the Environmental Damages Fund, and the Great Lakes Sustainability Fund. Many federal departments support similar initiatives aligned with their mandate including Agriculture and Agri-food Canada, Infrastructure Canada, and Aboriginal Affairs and Northern Development Canada.

Those jurisdictions that provide funding support for third-party watershed organizations generally also provide access to in-house jurisdictional expertise.