Interim Report on

Bi-national Management of Lake of the Woods and Rainy River Watershed

International Lake of the Woods and Rainy River Watershed Task Force

February 24, 2011

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Introduction

Local Efforts

Over the past decade, there has been growing interest in water quality and quantity issues within the Lake of the Woods and Rainy River watershed, with concern by citizens and community groups for the long-term ecological health of the watershed. Issues such as blue-green algae blooms in Lake of the Woods and excessive erosion along its south shore; introduction and impact of aquatic invasive species throughout the watershed; climate change; impacts of fluctuating water levels on traditional practices, shorefront properties and spring sturgeon spawning; effects of mining and hydropower development projects on water quality; and the ecological impacts of application of the 2000 rule curve have raised concerns over water management in the watershed.

Significant activity has been initiated in the watershed to respond to a number of these issues. The Lake of the Woods Water Quality Forum, held annually since 2003, allows researchers in the watershed to present findings of their work and identify emerging issues. The Lake of the Woods Water Sustainability Foundation was established in 2004 to heighten the awareness of water quality issues and to secure funding for research projects aimed at providing much-needed data. Local groups and governments signed resolutions of support to have the International Joint Commission (IJC) become involved in Lake of the Woods water quality issues[1]. In 2009, a Lake of the Woods Multi-Agency Working Arrangement was signed by nine entities (including seven agencies, one non-governmental organization, and one U.S. tribe) to enhance and restore water quality in the watershed. Resource agencies and organizations in the watershed have committed to ongoing and new research projects aimed at identifying sources of nutrients to Lake of the Woods and to the Rainy River and sharing that information. The International Joint Commission's Rainy Boards, working closely with dam operators and provincial, state, and federal agency representatives, established a voluntary hydro peaking agreement to limit fluctuations in water flows driven by variations in demand for electricity from hydropower facilities at Fort Frances-International Falls in order to minimize adverse environmental impacts. These are but a few examples of locally-led activities responding to issues of water quality and quantity in the watershed.

Request from United States and Canadian Governments

In order to ensure the long-term ecological and economic vitality of Lake of the Woods and the Rainy River watershed, and noting their work to foster trans-jurisdictional coordination and collaboration on science and management, the Governments of Canada and the United States determined that a review of the bi-national management of this watershed would complement these ongoing activities and contribute to any future approach to addressing new and emerging water quality issues and water management needs. On June 17, 2010, the Governments of Canada and the United States issued letters (Appendix A) to the IJC requesting that it review and make recommendations regarding the bi-national management of the Lake of the Woods and Rainy River Watershed and the IJC's potential role in this management. The recommendations address potential structures and mechanisms for governance, as well as priority issues or activities to be addressed by or through such mechanisms, with adherence to the following principles:

[1] Sample resolutions are included in appendices to the Work Plan of the International Lake of the Woods and Rainy River Watershed Task Force, available at http://www.ijc.org/conseil_board/rainy_river_watershed/workplan.

- The review and subsequent recommendations should be in line with the IJC's International Watersheds Initiative, which recognizes the strength in watershed-level solutions to trans-boundary environmental challenges and encourages collaboration, communication and coordination amongst local stakeholders, and
- The recommendations must respect existing treaties, orders and jurisdictional authorities already in place in this region.

International Joint Commission's Creation of a Task Force

The IJC appointed an International Lake of the Woods and Rainy River Watershed Task Force (Task Force) and assigned it the above mandate in a July 13, 2010 directive (Appendix B.) The IJC appointed the following members and secretaries to the Task Force and directed them to act in their personal and professional capacity, not as representatives of their countries, agencies, organizations, or other affiliations:

Melanie Neilson (Canadian Co-Chair)	James Chandler (U.S. Co-Chair)
Gail Faveri (Canadian Member)	Lee Grim (U.S. Member)
Kelli Saunders (Canadian Secretary)	Lisa Bourget (U.S. Secretary)

The IJC instructed the Task Force to coordinate its investigations and engage federal governments and relevant provinces, First Nations, tribes and states, as well as the wider body of stakeholders and the public, and to consult with the International Rainy Lake Board of Control and International Rainy River Water Pollution Board. On July 13, the IJC authorized the Task Force to begin its work immediately and instructed it to submit its final report no later than July 15, 2011. The IJC came to the watershed August 31-September 2, 2010 to launch the effort. It received briefings, made site visits, and held public meetings in International Falls (Minnesota), Kenora (Ontario), and Warroad (Minnesota) which the Task Force attended.

Task Force Purpose and Scope

Within the broad context of the charge from the IJC, the Task Force has examined activities that affect water quantity and water quality in boundary waters, as well as activities on one side of the border that could potentially have a significant effect on water-related uses or resources on the other side.

In looking at existing and potential structures and mechanisms for bi-national governance, the Task Force has viewed the concept of governance quite broadly. Both the institutions and processes for decision-making are being considered. For example, several treaties and Orders are already in place in the watershed. Bi-national studies have been carried out by the IJC at the request of the two governments. Bi-national oversight of water quality in the Rainy River continues. Formal and informal memoranda of understanding and other arrangements exist between federal, state and provincial agencies and one tribe regarding water resource related issues. In addition, domestic decision-making bodies in each country often invite the participation of affected interests from the other country. Many of these arrangements have evolved over time to address changing needs. All of these approaches contribute to comprehensive bi-national governance and provide opportunities to fully reflect and incorporate the shared interests of the watershed as a whole.

Noting that the letters from governments focus on the Lake of the Woods and Rainy River basins and request that the study be in line with the International Watersheds Initiative, the Task Force will

consider watershed issues of bi-national concern within the geographic area of the entire Lake of the Woods watershed upstream of its outlet into the Winnipeg River, giving particular focus to effects on boundary waters as defined in the Boundary Waters Treaty (See Figure 1.) In addition, the Task Force will also consider downstream interests beyond the Lake of the Woods and Rainy River watershed that may conceivably be affected by changes within that watershed.

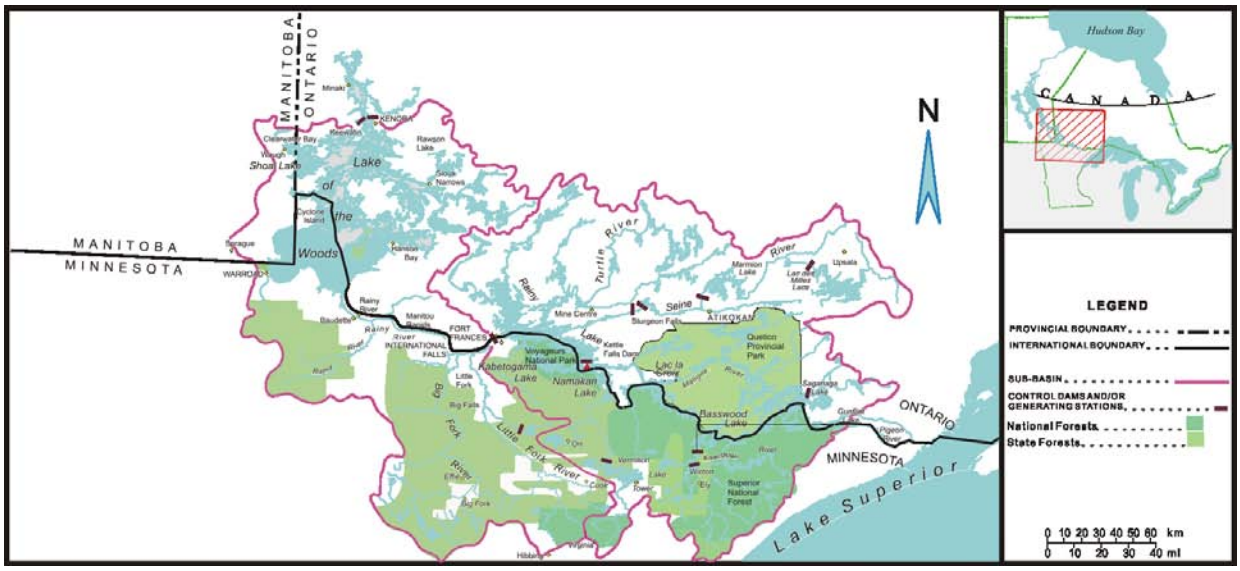


Figure 1: Map of Lake of the Woods – Rainy River Watershed

The Task Force has been given a unique opportunity, in concert with those who have achieved so much already in the watershed, to reflect accomplishments to date, explore possible options for change, and propose a path that can help set the stage to successfully address bi-national water management challenges now and for the foreseeable future. This can be done only with those who have already laid the groundwork, are solving today's issues, and are positioning themselves to make further strides. The Task Force serves as a focal point for input, discussion, and consideration of local and regional issues within a bi-national context.

This interim report is intended to describe Task Force progress to date, describe the current state of affairs regarding bi-national water management, and provide an initial basis for future consideration of governance options. It reflects preliminary findings from the many conversations the Task Force has held with governments at all levels, non-governmental organizations, and citizens. The interim report is seen by the Task Force as an opportunity for comment and feedback, and as a stepping stone to the draft final report it anticipates issuing in May 2011. That draft final report will build on and supersede this interim report.

Task Force Approach

The Task Force developed a work plan with a proposed approach, including a public engagement plan and a schedule. It provided an early draft to the IJC August 20, 2010 but kept the document in draft form pending opportunity for discussion, comment, and refinement. The final work plan, approved by the IJC December 10, 2010, is available at http://www.ijc.org/conseil_board/rainy_river_watershed/workplan . The work plan proposed an interim report presenting progress to date and any preliminary findings (primarily a factual report describing and categorizing major issues and describing authorities, responsibilities, organizations, and relevant efforts underway.) It also proposed a final report including recommendations, to be issued in draft form in May 2010 for comment prior to being finalized for submission to the IJC in July 2010.

The Task Force characterized its main tasks as reviewing the ways that Canada and the United States work together to manage water quality, water quantity and related issues in the watershed, identifying gaps in the current approach, identifying key existing or emerging issues that require attention, and recommending any new or adjusted governance mechanisms that would help address the identified future needs. It determined very early that, to do its work well, it would need to undertake significant outreach with particular focus on current and planned activities that affect or can affect the boundary waters in the watershed. The Task Force reviewed existing relevant reports and relied on information and consultations with experts (see Appendix C for Task Force outreach) to provide the context in which it considered bi-national management and did not collect scientific data or perform technical analyses.

Citizens Advisory Group. The Task Force broadly invited expressions of interest for a Citizens Advisory Group (CAG), an informal group that serves as a sounding board for the Task Force, reviews Task Force draft reports, and makes recommendations on possible bi-national management structures and priority issues or activities. The Task Force appointed 38 members to the CAG, split approximately 50% U.S. and 50% Canadian, and left open the opportunity for additional members to be added over time (see Appendix D for a list of current members.) CAG members participated in an introductory telephone call and then attended one or more of four meetings held in the watershed October 25-28, 2010, to provide feedback on the Task Force's draft work plan and to allow for more detailed discussion and dialogue than might be possible during public meetings. CAG members developed guidelines, identified issues and additional relevant organizations, and offered observations regarding governance. The Task Force established a limited-access website for CAG use, posted background documents, initiated options for CAG online discussion chains on particular subjects, and provided a draft list of issues and a range of possible governance options. The Task Force and CAG will discuss the interim report during April 5-7, 2011 meetings in Warroad (Minnesota), Orr (Minnesota) and Sioux Narrows (Ontario.) Further discussions will be held regarding the Task Force's draft final report during June 13-16 meetings in Atikokan (Ontario), Fort Frances (Ontario), Baudette (Minnesota), and Kenora (Ontario.)

Public-at-Large. The Task Force established a website (http://www.ijc.org/conseil_board/rainy_river_watershed/) for general information including information about the Task Force and its mandate, contact information, background documents, Task Force documents such as the approved work plan, and notifications such as for public meetings or joining the CAG.

The Task Force held an initial series of public meetings October 25-28, 2010, in Ely (Minnesota), International Falls (Minnesota), Kenora (Ontario), and Winnipeg (Manitoba) to receive comments on its

draft work plan and information regarding issues of concern. Further public meetings are planned April 5-7 and June 13-16, 2011 in the same locations as meetings with the CAG. Meetings are advertised in advance in local media.

The Task Force is also planning to participate in several events hosted by others at which it can present information, answer questions, and discuss issues. These include the March 9-10, 2011 Lake of the Woods Water Quality Forum in International Falls (Minnesota) and the May 2, 2011 Lake of the Woods District Property Owners' Association Annual General Meeting and Cottage Show in Winnipeg (Manitoba.)

Bi-national Organizations and Arrangements. The Task Force spoke with bi-national entities, formal and informal, that operate within the watershed: the Lake of the Woods Control Board, the International Lake of the Woods Control Board, the International Rainy Lake Board of Control, the International Rainy River Water Pollution Board, the Ontario-Minnesota Fisheries Management Committee, and the Lake of the Woods Multi-Agency Working Arrangement (both management/working group level and technical advisory group level.) It also arranged discussions with representatives involved in bi-national arrangements in other watersheds, including the Red River and Lake Champlain watersheds; four examples of bi-national governance approaches in other geographic areas (as listed in the Table of Contents) are included in this interim report in order to illustrate how governance is being handled elsewhere.

Aboriginals and Native Americans. The Task Force sent introductory letters to two Tribes in the U.S. and 24 First Nations in Ontario and Manitoba located in or near the watershed asking how they might prefer to interact with the Task Force, and providing information about the Task Force and questions the Task Force wished to ask (see Appendix C.) Task Force members made follow-up calls and sent follow-up emails as needed. The Task Force met with Iskatewizaagegan No. 39 (Shoal Lake 39) Independent First Nation as well as Ochiichagwe'Babigo'Ining (The Dalles) First Nation at their request.

The Task Force also contacted tribal governance organizations. It made presentations at the Treaty 3 National and Chiefs General Assembly in October, 2010; to the Kenora Chiefs Advisory in November, 2010; met with Network for Native Futures; and discussed appropriate approaches with the Fort Frances Chiefs Secretariat and the Anishinaabeg of Kabapikotawangag Resource Council.

Grand Council Treaty 3 suggested a special conference to ensure the views and concerns of First Nation communities in the watershed are heard on the issue of bi-national governance; the Task Force is pursuing arrangements and hopes to organize such an event jointly with the Grand Council Treaty 3. The Task Force is also discussing with the Métis Nation of Ontario possible opportunities for discussion with its representatives.

The Task Force forwarded Aboriginal and Native American concerns beyond its purview to the IJC.

Resource Agencies. The Task Force contacted 26 agencies at federal, state, and provincial levels of government (see Appendix C.) It arranged for individual discussions with most of these agencies to gain a better understanding of current and future initiatives, issues of concern, and perspectives regarding bi-national governance.

Communities, Municipalities, and Counties. At the suggestion of two former mayors, the Task Force issued introductory letters with a questionnaire to 46 communities, municipalities, and counties (see

Appendix C.) The questionnaire asked for information and views as well as desired level of involvement with the Task Force, ranging from none to a desire for follow up. Task Force members issued follow-up emails as needed.

Inter-linkages. The Task Force considered the connections among organizations and mapped these connections for sample issues to help address the issue of scale in understanding how resources are managed in the watershed.

Subsequent to Task Force Efforts

After the Task Force completes its work by July 15, 2011, it anticipates the IJC will hold public meetings and prepare its report to the governments of Canada and the United States by December 31, 2011. The governments may then initiate any needed studies and will carry out their own consultations within their respective countries on future bi-national action in the watershed.

Sidebar: International Red River Board and International Red River Basin RRBC

Another example of bi-national governance occurs in the Red River Basin (Red River of the North) in Minnesota, North Dakota, South Dakota and Manitoba. There the IJC boards overseeing pollution and water quantity in the Souris and Red river basins were transformed in 2001 to form a 12 member watershed board for the Souris River basin and an 18 member international watershed board for the Red River basin. Within the larger International Red River Board (IRRB), a subcommittee focuses on aquatic ecosystems and another on hydrology concerns. The subcommittees prepare their work plans for approval by the board as a whole.

A second grass-roots, not for profit organization, works in concert with the IJC board. The Red River Basin Commission (RRBC) has a U.S. member and a Canadian member on the IJC's International Red River Board. This group often works on contracts let by the IJC board. Also, the RRBC's frequent public meetings which rotate throughout the basin and it's annual conference provides the opportunity for IJC board members to have frequent contact with the public concerns and emerging issues voiced by the members of the RRBC.

The RRBC has a 41 member Board of Directors comprised of First Nations, tribes, provincial, state, county, and municipal officials. There are no federal representatives on the RBBC board. Rather federal agencies are considered ex-officio members and are invited to the RRBC's September meeting. The RRBC's mission is to have a living document, the Integrated Natural Resources Framework Plan, adopted as guidance throughout the basin with commitments to ensure its implementation. The plan covers water quality objectives and best management practices, and soil conservation, ecology, recreation and drought, but recent public concerns have been largely involved with flooding and flood mitigation. Land use is mentioned implicitly in the plan. The RRBC has neither authority nor funding but its strength is in its strong ability to educate and foster communication across the basin and across levels of government.

The proposed Nutrient Management Strategy for the basin illustrates the synergy between the RRBC and the IRRB. Because the federal and state representative on the IRRB recognize the need for a strategy, and the IRRB's ability to fund the science, through the IJC and led by the Aquatic Ecosystem subcommittee, the targets which will be developed as part of the strategy will be adopted by the county, state and municipal governments of the RRBC who have the ability to promote best practices to meet the targets. The RRBC currently acts in an outreach role to foster adoption practices at the local level and push for funding at the state, provincial and federal levels.

The Watershed

"Watershed" is the term used to describe the geographic area of land that drains water (drainage basin) to a shared destination. A watershed, therefore, is "an area of land that drains water, sediment, and dissolved materials to a common outlet" (FISWRG, 1998). Every waterway lies within a watershed, and smaller watersheds join together to become larger watersheds. Watershed boundaries always follow the highest ridgeline (drainage divide) around the stream channels and meet at the bottom or lowest point of the land where water flows out of the watershed.

A watershed may be small and represent a single tributary within a larger system, or be quite large and cover thousands of miles. Watersheds have been defined and named using standardized protocols. Naming conventions are defined at a regional scale, and then are broken down into smaller watershed units for management purposes (USGS, 2008).

The concept of a watershed is very important because it pertains to everyone. No matter where people live, they live in a watershed and what we do on the land affects water quality for all communities living downstream. Water is a universal solvent affected by all that it comes in contact with – the land it traverses and the soils through which it travels (taken from Federation of Ontario Cottagers' Associations, 2009). Features of a watershed not only include the physical characteristics (streams, lakes, valleys, fields, forests, wildlife, etc.), but also the socio-economic features of the landscape such as roads, towns, pits, farms and industry. What is common to both the physical and the socio-economic features is the water.

The Lake of the Woods and Rainy River Watershed (here after the Watershed) is a part of the larger Winnipeg River watershed in Northwestern Ontario, Eastern Manitoba and Northeastern Minnesota that drains to Lake Winnipeg in Manitoba. The Watershed encompasses approximately 69,750 km^2 (27,114 $miles^2$) in Canada and the United States, of which 11,244 $miles^2$ (41 percent) are in Minnesota and 15,870 square miles (59 percent) are in Ontario and Manitoba (MPCA 2004 and DeSellas et. al. 2009). The maximum distance from east to west in the Watershed is approximately 400 km (240 miles), and from north to south 260 km (156 miles).

The Watershed is comprised of four smaller watersheds – the Lake of the Woods (LOW, 14,864 km^2), Upper Rainy River (URR, 18,813 km^2), Lower Rainy River (LRR, 16,760 km^2) and Central Rainy River (CRR, 19,314 km^2) (Gartner Lee Limited, 2007). See Figure 1. The URR watershed is almost all in the Ontario portion of the Watershed. The CRR watershed of Minnesota and Ontario flows into the Namakan reservoir before entering the Rainy Lake reservoir. The URR and CRR watersheds then drain into the Rainy River at Fort Frances and International Falls. The tributaries that flow directly into the Rainy River west of the RR headwaters comprise the LRR watershed receiving water from Minnesota and Ontario. Waters that flow to LOW but not via the RR are within the LOW watershed of Manitoba, Ontario and Roseau and Lake of the Woods Counties of Minnesota.

The Minnesota portion of the Watershed is bounded on the East by the Lake Superior Watershed (LSW), the South by the Upper Mississippi Watershed and the West by the Red River Watershed. The U.S. side is made up of nine smaller quaternary watersheds- Rainy River Headwaters, Vermilion River, Rainy River/Rainy Lake, Rainy River/Manitou, Little Fork River, Big Fork River, Rapid River, Rainy River/Baudette, and Lake of the Woods within the four larger watersheds of the Lake of the Woods and Rainy River Watershed.

The Minnesota headwaters are located in Cook, Lake, Koochiching, Itasca and St. Louis Counties. The eastern portion includes an extensive area known as the Boundary Waters Canoe Area Wilderness within the Superior National Forest. A new state park is being developed on Lake Vermilion near the Vermilion Iron Range. The southern headwaters portion includes part of the Mesabi Iron Range and numerous lakes and streams situated in glacial till and moraines. Relatively large lakes characterize the central portion of the basin located in Koochiching and St. Louis counties. This area includes Voyageurs National Park, with Crane, Kabetogama, Namakan, Rainy and Sand Point Lakes. The Lake of the Woods portion of the Watershed, located in Roseau and Lake of the Woods Counties, is characterized by extensive wetlands located on the old Glacial Lake Agassiz lakebed and Lake of the Woods (MPCA, 2004).

The Canadian portion of the Watershed lies within the Kenora, Fort Frances and Thunder Bay Management Districts of the Ontario Ministry of Natural Resources. The far eastern portion includes the Lac de Milles Lacs area and the upper section of the Seine River watershed North and East of Quetico Provincial Park. The highest density of streams, lakes and ponds are found in this portion of the Watershed. The Canadian portion consists of 42 smaller quaternary watersheds within the four larger watersheds of the Watershed (DeSalles et al., 2009).

Lake of the Woods, the largest lake in the watershed, covers an area of 3,850 km^2, spanning maximum distances of 105 km from north to south and 90 km from east to west. It contains approximately 14,500 islands, which make it extremely hydrologically complex (DeSalles et al., 2009). Water exits from the eastern Kenora powerhouse dam and western Norman dam separated by Tunnel Island at Kenora into the Winnipeg River on the far north end of Lake of the Woods. Outflows and levels have been regulated there since the mid-1890s.

Terrestrial Zones of Vegetation

Canadian and U. S. ecologists use different systems to classify terrestrial vegetation in the region (Environment Canada, 2007; MNDNR, 2003; and Nature Conservancy, 2002).

The Minnesota watershed lies within the Laurentian Mixed Forest Province (LMFP), a broad ecotone between the eastern deciduous forest and boreal forest biomes of North America. Provinces are large units of land defined using major climatic zones, native vegetation and biomes. There are three ecological sections within the LMFP--the Northern Superior Uplands that contain the Border Lakes subsection; the Northern Minnesota and Ontario Peatlands that contain the Agassiz Lowlands and the Littlefork and Vermilion Uplands subsections; and the Northern Minnesota Drift and Lake Plains that includes the St. Louis Moraines subsection. The sections are characterized using the origin of glacial deposits, regional elevation, distribution of plants and regional climate.

The Canadian portion of the Watershed lies in the Boreal Shield ecozone and Great Lakes-St. Lawrence Forest Region. Smaller areas in the region are the LOW, Rainy River and Thunder Bay/Quetico Eco-regions in Ontario and the LOW and Southern Agassiz Plains and Lake Eco-districts of Manitoba.

Within the Thunder Bay/Quetico Eco-region there is a transition from north to south, whereby the northern section is generally dominated by boreal coniferous species (i.e. spruce and jack pine) and the southern section is characterized by a higher component of hardwood species (i.e. poplar and birch), and conifer species such as red and white pine.

The Rainy River Eco-region has low relief with flat to undulating topography. This region has broad swamps and peat lands as the dominant feature, with species such as black spruce, white cedar, trembling aspen, balsam poplar, balsam fir, and white spruce. White elm, basswood, maples, and bur oak can be found on riverbanks.

The Southern Agassiz Peatlands and Lake Plains Eco-district in Manitobais located on the southern part of the lake plain left by GlacialLake Agassiz. The largest patterned peat-land complex in the contiguous United States dominates it. The section extends in a broad, northwest-to-southeast band from the southeastern shore of Lake Winnipeg down to the Upper and Lower Red Lakes and across to Vermilion Lake in the URR watershed.

The LOW Ecoregion/Section extends from Lac du Bonnet in southeastern Manitoba to the east side of Rainy Lake on the Canada-United States border. Patterned peatlands composed of open and treed fens and bogs form the dominant ecosystem. This section is dominated by jack pine and black spruce, white spruce, and balsam fir. Bogs are dominated by black spruce and Sphagnum mosses, while fens are vegetated with sedges, tamarack, alder, and bog birch.

Geology

Bedrock Geology

The Watershed lies mainly within the Superior Structural Province of the Precambrian Shield. The bedrock in this Province was formed 2.5 to 2.9 billion years ago, in the Archean Era when the birth of the North American continent was occurring. During this time there were intense periods of volcanism, island arc formation, mountain building, faulting, earthquake activity, folding, and metamorphism of crustal materials followed by over two billion years of erosion. That combined erosion and subsequent glacial activity reduced possibly 10,000 feet mountains to a relatively flat landscape 1,660 to 1160 feet in the Watershed today.

The Superior sub-province is further subdivided into the Quetico Sub-province and the Wabigoon Sub-province. The Seine River approximates the boundary between these two Sub-provinces. The Wabigoon Sub-province is characterized by Greenstone belts of volcanic and sedimentary rocks, intruded by rock of granitic composition. The sedimentary rock was derived from the erosion of volcanic and other rock, and is usually found in narrow bands parallel to the length of the volcanics. Greenstone belts are found along the Rainy River, the eastern portion of Rainy Lake and the Seine River, the Manitou Lakes, the Tower/Ely area, and the Pipestone Lake area. Masses of elliptical granitic rock occur in the Morson/Nestor Falls Area and Lake of the Woods and the northern Rainy Lake Area.

The Quetico Sub-province of the Precambrian Shield dominates much of the former Flanders area, including Namakan, south of the Seine River. Sedimentary rocks that were eroded from the Wabigoon Sub-province and subsequently metamorphosed characterize this area.

A massive Vermilion granitic batholith intruded into the crust along the southeastern region of the Watershed. The underlying bedrock controls the topography. The bedrock in the BWCAW and Quetico is exposed at the surface from Ely eastward to Saganaga and Sea Gull Lakes and in the granitic hills from Basswood Lake through Lac LaCroix to VNP and south to Vermilion and Burntside Lakes (Heinselman 1996). Other rocks of the Knife Lake Group in the BWCAW and Quetico are steeply tilted and fractured. Lakes there occupy the rock basins between ridges and are long, narrow, deep, and trend northeast.

About 2.0 billion years ago materials of the Mesabi Iron range and Gunflint formation were deposited in oceans on the eastern edge of the Watershed. Almost a billion years later, crustal rifting down the middle of Lake Superior watersed to the east of the Watershed caused major lava eruptions that flowed west away from the LSW over the more ancient bedrock formed earlier and intruded magma laden with precious metals into the older continental crust and cooled deep within the crust. There has been much precious mineral and iron deposition during bedrock formation in the Watershed.

Surficial Geology

Virtually all of the surficial geology in the Watershed is glacial in origin. About two million years ago four great ice sheets advanced and retreated across the watershed, the last occurring during the Wisconsin ice age that spanned from 50,000 to 10,000 years ago. The weight of the ice sheets caused the continental crust to sink beneath their weight. The erosion of the landscape and deposition of the eroded materials created an irregular covering over the watershed. The melt water created new stream systems, glacial lakes, and other depositional features. Glacial Lake Agassiz was extant for about 5,000 years and at its maximum extent covered over 500,000 km^2. Lake Agassiz waters covered many of the present large lakes in the Watershed (Zoltai, 1961, Teller 1983). As the ice and melt-waters were removed from the landscape the depressed crust began to slowly rise – isostatic rebound. The uplift is still occurring in the watershed and causing water depths to increase in areas like the south shore of Lake of the Woods where there are significant shoreline erosion issues.

Glacial Lake Agassiz deposited laminated sediments of clay and silt in the lowlands adjacent to Rainy River, Lake of the Woods, and Rainy Lake. In other areas, clay and silt deposits occur only as small pockets. Large peat bogs occur in the Agassiz lacustrine plain with beaches of sand and gravel occurring along the northern boundary of the clay plain. The last ice movement had the greatest impact on the northern part of the Watershed where tills consist primarily of coarse stony granitic materials and huge glacial erratic boulders. Sandy till is the main constituent of ground moraine, but local pockets of sand and gravel are not uncommon (Roen, 1980).

A narrow, discontinuous terminal moraine extends from Sabaskong Bay of Lake of the Woods to Northwest Bay of Rainy Lake (Zoltai, 1961). This moraine sometimes rises over 100 feet above the surrounding country (Zoltai, 1961). A Steep Rock Moraine extends from Steep Rock Lake in a southeasterly direction (Zoltai, 1965). The Vermilion Moraine of the Rainy Lake Ice Lobe rises high above the landscape along Highway 53 near Orr, Minnesota.

Once the glacial age waned, youthful soils began to reform on the exposed landscape. Till which is rock fragments in an unsorted matrix of sand and finer clay particles covered the entire watershed. The till was modified by freezing and thawing, chemical weathering, and by the accumulation of organic material from animals and plants displaced by the ice sheets that gradually returned. The soils of the Rainy River lacustrine plain are mostly silts and clays. The accumulation of organic material is characteristic of the wet sites. The lacustrine plain is characterized by weakly broken terrain, interrupted by the occasional beach ridge of glacial Lake Agassiz. Deep soils are generally restricted to the lacustrine plain.

Rolling rock ridges are covered by very shallow deposits of stony, silty sands. In areas of granite, the ridges are either bare, or covered by a very shallow mantle of silty-sand till. Areas underlain by volcanic rock tend to have more nutrients and bare rock is less common (Smith, 1966).

The most widespread soil substrate in the Watershed is a shallow discontinuous ground moraine composed of sand mixed with gravel, stones, and boulders less than a meter deep. The ground moraine is derived from metasediments and greenstone belts, and is moderately acidic and relatively rich in available nutrients.

At the area south of the Namakan River, and along the eastern edge of the unit adjacent to Quetico Park, the ground moraine is derived from granite and the soils tend to be acidic and low in nutrients. Soil depths are shallow to extremely shallow. Only small portions of the watershed have suitable soils for farming.

Climate

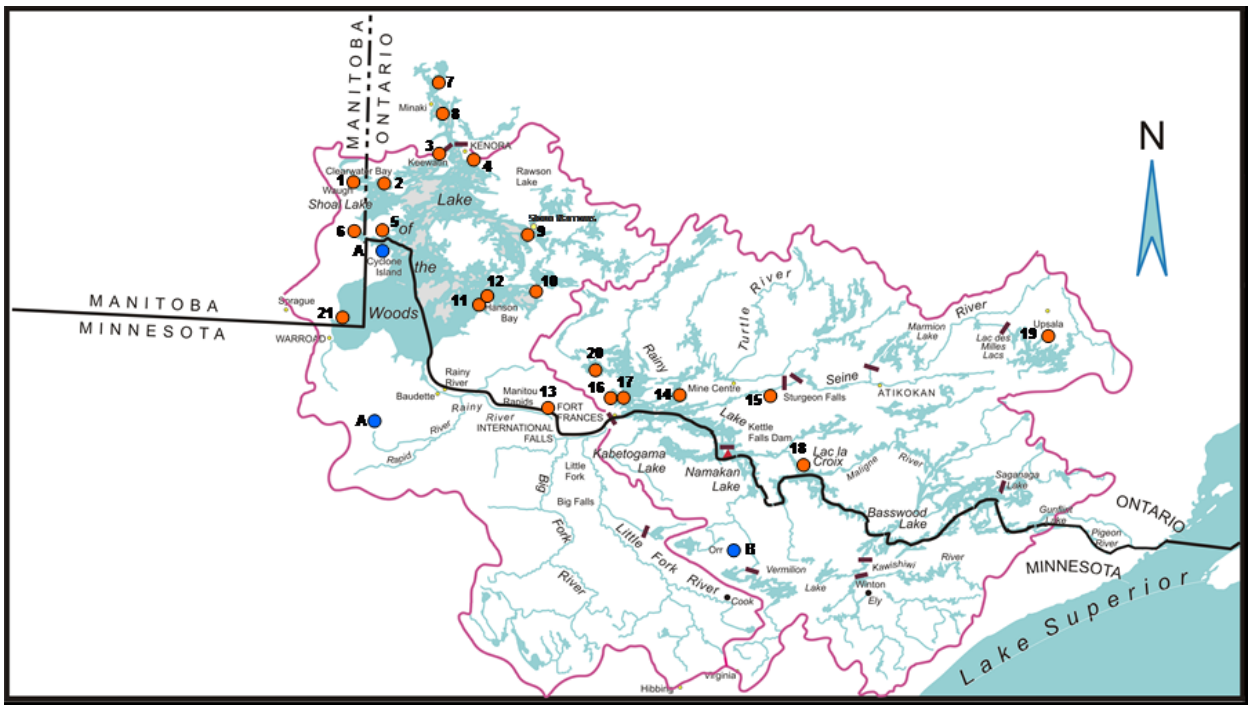
The Watershed climate is marked by warm, moist summers and cold winters. The mean annual temperature is approximately 1 to 2°C (34 to 36°F). Mean summer and winter temperatures in the region are 17.8°C (64.0^{0}F) and -15.0^{0}C (5^{0}F). Snowfall averages have ranged from 40 inches in the west to 70 inches in the east portions of the Watershed. Snow is typically on the ground from November through April, with the warmest month being July. Warmer than average temperatures have occurred in recent years, especially in winter, consistently since 1988. The length of the frost-free season has increased by 13 days, on average, over the last 88 years. The length of the ice-free season is increasing on LOW, with ice out occurring around 15 days earlier than the beginning of the monitoring period (0.3d days/year from 1964-2007) (DeSalles et al., 2009.) A similar pattern has occurred in other regional lakes in VNP, northern Wisconsin, and the Experimental Lakes Area in Northwestern Ontario.

DeSalles et al. (2009) reported that the region receives an average of 742 mm (29 in) (1919-2004) of precipitation per year, most of which falls between May and September. About 70% of the moisture falls as rain, July being the wettest month. The average total precipitation in summer is 287 mm (11 in) and in winter 115 mm (4.5 in). Trends in increasing temperature and precipitation, and declines in winter precipitation occurred throughout the Canadian Shield and Laurentian Great Lakes regions in previous decades (Magnuson et al., 1997)

Frelich (2010) expects that the Watershed will likely experience a magnitude of climate change much larger than the global mean than for other interior boreal forests. That is because this forest is close to the prairie-forest border. Thus, very large changes in natural environments can be expected, with some predicting increases in summer temperatures to be 5-7°C (10-15°F) by the end of the 21st Century.

Land use

Human population centers are sparsely distributed in the Watershed and are concentrated in a few city areas, on First Nation and Tribal lands, and in seasonal residences around the shorelines of major lakes. Larger communities in the watershed include Kenora, Ontario (population 15,177 per 2006 Canadian Census) in Canada, International Falls, Minnesota (population 6,503 per 2000 U.S. Census). Population density ranges from approximately 0.15 to 1.79 people per square kilometer for specific counties and districts in the area (DeSalles et. al, 2009). Approximately two dozen Aboriginal and Native American communities are located within or near the watershed (see Figure 2.)



A. Red Lake Band of Chippewa Indians B Boise Fort Band 1. Shoal Lake #40, 2. Iskatewizaagegan #39, 3. Wauzhusk Onigum First Nation, 4. Obaskaandagaang First Nation	5. Northwest Angle #33 First Nation 6. Northwest Angle #37 First Nation 7. Wabeseemoong First Nation 8. Ochiichagwe'Babigo'Ining First Nation 9. Naotkamegwanning First Nation 10. Ojibways of Onigaming First Nation	11. Big Grassy First Nation 12. Big Island First Nation 13. Rainy River First Nation 14. Nigigoonsiminikaaning First Nation 15. Seine River First Nation 16. Couchiching First Nation	17. Mitaanjigaming First Nation 18. Lac La Croix First Nation 19. Lac Des Milles Lacs First Nation 20. Niacatchewenin First Nation 21, Buffalo Point First Nation

Figure 2: First Nations and Tribal Communities in the Lake of the Woods, Rainy River watershed.

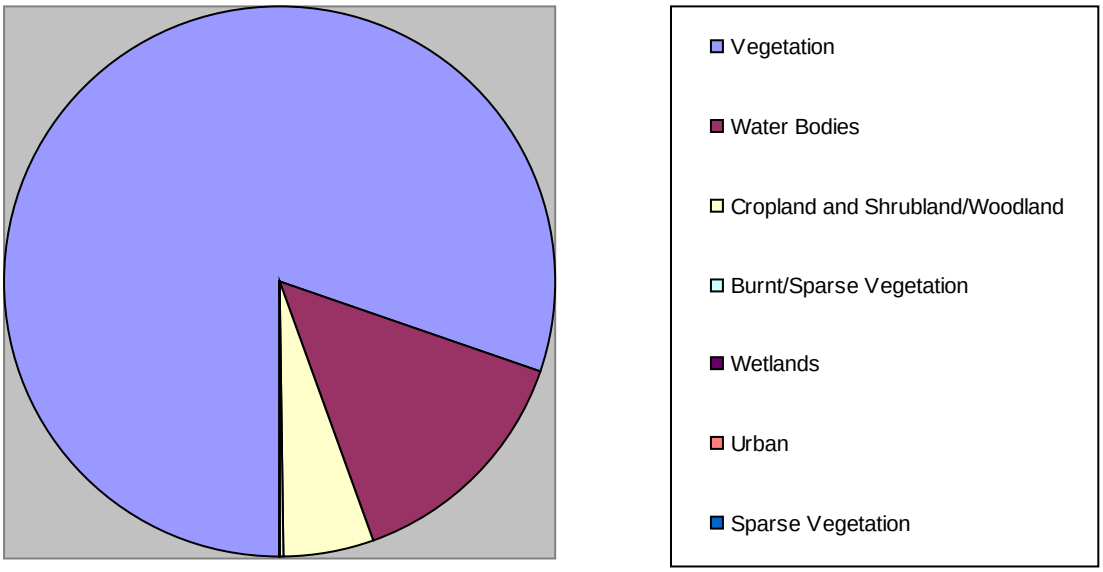


Figure 3: Land Use Characteristics

Land use characteristics (resolution 1 km^2) within the Watershed are discussed in DeSalles et al. (2009, USGS, NRC, and AAFC 2000 data). As per Figure 3, the characteristics and their occurrences for the entire Watershed include vegetation (81.1%, 55,656 km^2), water bodies (14.2%, 9,841 km^2), cropland and shrubland/woodland (5.5% 3,827 km^2), burnt or sparse vegetation (0.1%, 63 km^2), wetlands (0.1%, 41 km^2), urban and built-up areas (15 km^2) and consolidated rock and sparse vegetation (6 km^2). The LOW watershed contains the largest areas of open water and wetlands.

The Watershed is predominantly tree covered. Sawmill and pulp and paper production facilities drive much of the economy. Thus predominant uses are timber harvesting, throughout all four watersheds. Forest fires are not uncommon in the area, which include naturally occurring and prescriptive burns.

Gathering wild rice, hunting, fishing, trapping, water-based tourism and other summer and winter outdoor recreational activities are important multiple/wilderness land uses throughout the Watershed. They generate a significant portion of the Watershed economy. The extensive interconnected waterway systems in the heart of the continent have been designated as provincial parks and national wilderness areas.

Major mining activities have occurred in the past (Steep Rock Iron Mine, Vermilion Iron Range, Mesabi Iron Range) and some others presently occur. Future mining activities in the east and west portions of the Watershed are proposed for mining iron, gold and other precious metals.

Agriculture and croplands occur mostly in the LOW and LRR watersheds. Crops grown include hay, flax, oats, wheat, alfalfa, cranola, and grass seeds.

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Sidebar: Niagara

Declaration of Intent and the Niagara River Toxics Management Plan

The problems of toxic chemical pollution in the Niagara River have been well documented, in particular through a multi-agency study that culminated in the Niagara River Toxics Committee (NRTC) report of October 1984. In response to the recommendations in this report, in 1987, the United States Environmental Protection Agency (EPA Regional Administrator), Environment Canada (EC Minister), the New York State Department of Environmental Conservation (NYSDEC Commissioner) and the Ontario Ministry of the Environment (MOE Minister) – the "Four Parties" – signed a Declaration of Intent. The objective of the Declaration of Intent was to establish a management strategy so that the Parties moved in a directed and coordinated manner toward the objective of achieving significant reductions of toxic chemical pollutants in the Niagara River in accordance with timetables and specific activities. The Declaration of Intent was thus consistent with the goal of virtual elimination of toxic discharges, as agreed upon in 1978 by the Governments of the United States and Canada under the Great Lakes Water Quality Agreement. The Parties committed themselves to using the authority provided by their domestic laws and regulations to achieve this goal.

In October 1986, the Parties released the first edition of the Four-Party Work Plan which established timetables and a set of specific activities to be undertaken. The Declaration of Intent, in conjunction with the Work Plan, together formed The U.S. – Canada Niagara River Toxics Management Plan (NRTMP).

The NRTMP committed the Parties to reduce toxic chemical pollutant inputs from point and non-point sources to the Niagara River, in a manner consistent with federal, state and provincial laws. It also committed them to establishing a common basis for identifying, assessing and quantifying toxic chemical loadings into the Niagara River, including the development of a joint upstream/downstream monitoring program. The initial milestone was to achieve a 50% reduction in loadings of key toxic chemicals, later identified as the "Priority 18'" from point and non-point sources in Ontario and New York by 1996. There was a commitment to update the Work Plan, and report on progress as well as the state of new and emerging hazardous waste landfill remediation technologies at public meetings on an annual basis.

A governance structure was established to oversee implementation of the NRTMP:

1. The Niagara River Coordination Committee (NRCC) was comprised of accountable senior-management level representatives from the Four Parties (USEPA Region 2 Regional Administrator; EC Ontario Regional Director General; NYSDEC Commissioner; MOE Assistant Deputy Minister). They were accountable for progress and presided over the public meetings.
2. The Niagara River Secretariat (NRS) was comprised of senior agency program staff; they maintained the Work Plan and prepared the annual progress reports, including updates on hazardous waste landfill remediation technologies.
3. Committees of experts from the Four Parties were established to oversee and provide updates on inputs from point sources (Point Source Committee) and non-point sources (Non-point Source Committee).
4. A River Monitoring Committee (RMC) was established to design and implement an upstream/downstream Niagara River monitoring program and to report on in-river concentrations and loadings of toxic pollutants. EC funded and implemented the program using

Four-Party agreed-to protocols for sampling, analysis and data interpretation (initially, there were 3 Working Groups to develop the respective protocols).

5. There is no termination date written into the Declaration of Intent, however, there is a milestone of at least a 50% reduction in the "Priority 18" chemicals of concern from point and non-point sources in Ontario and New York by 1996. Even though the Four Parties achieved considerable success in meeting that target, in 1996 the Four Parties reaffirmed their commitment to the NRTMP and to developing a post-1996 strategy for continued reduction of toxic pollutants by signing a Letter of Support.

Now, in 2011, work continues on reducing toxic chemical pollutants in the Niagara River. The Coordination Committee, NRS and RMC are still in place; the Niagara River upstream/ downstream monitoring program continues; the Work Plan is updated and reporting is conducted on a 3 year cycle. Public meetings are held every 3 years.

Historical Context and Frameworks

Since at least as far back as the fixing of the international boundary between the Dominion of Canada and the new United States of America, there has been a series of governance mechanisms and arrangements covering the Lake of the Woods - Rainy River watershed that either directly or indirectly affect water quality or water quantity, or water-related resources of bi-national concern. Following is a short description of the major governance mechanisms and arrangements that have been put in place.

Treaties, Conventions, and Bi-National Practice

Aboriginals and Native Americans

In the Nineteenth Century, in both the U.S. and Canada, treaties were made with First Nations, Métis, and tribes to end long periods of conflict and provide a framework for future relations. In Canada, Treaty #3 in 1873 between Great Britain on behalf of the Dominion of Canada and the many Ojibway First Nations and Métis around Lake of the Woods began to define the future relationship of these peoples in the Lake of the Woods watershed, including the responsibilities of the government of Canada toward the First Nations. This relationship is particularly important given the First Nations' and Métis proximity to and dependence on the water related resources of the watershed for their economic and spiritual well-being. Aboriginals and the Canadian government continue to discuss how to address their remaining concerns, and their relationship continues to evolve.

In the United States, 1850s and 1860s treaties with the Bois Forte and Red Lake bands were only the starting point for developing a new relationship between the tribes and the U.S. federal government. In 1908, the U.S. Supreme Court, in Winters v. U.S., supported the principle that ambiguities in treaties with tribes should be resolved from the standpoint of the tribes and that this principle should certainly be applied to determine between two inferences, one of which would support the purpose of the agreement and the other would impair or defeat it. Building on this and other principles, the relationship between the U.S. government and the Red Lake and Bois Forte bands has continued to evolve.

The Boundary Waters Treaty of 1909

In 1909, the governments of the U.S. and Great Britain, on behalf of the Dominion of Canada, entered into the Boundary Waters Treaty, which established the basic principles for managing many water related issues along the International Boundary and established the International Joint Commission (IJC) as a permanent international organization to assist the governments in several ways. The most relevant provisions of the treaty for the Lake of the Woods and Rainy River watershed follow.

The treaty provides for freedom of navigation of all navigable boundary waters, subject to the laws and regulations of either country within its own territory, provided there is no discrimination against inhabitants or boats of the other country.

Each country has exclusive jurisdiction and control over the use and diversion of water in rivers that would flow across the boundary or into boundary waters; but anyone downstream in the other country injured by a use or diversion will be given the same legal rights as if the injury occurred where the use or diversion took place.

With a couple of exceptions for domestic and sanitary uses and governmental works, uses, diversions or obstructions of boundary waters affecting water levels or flows on the other side of the boundary require international approval, either by special agreement between Canada and the United States or by the IJC.

Dams in waters flowing from boundary waters or in trans-boundary rivers downstream of the boundary that raise water levels in the other country require international approval, either by special agreement between Canada and the United States or by the IJC.

Boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other.

The Governments may refer questions or issues to the International Joint Commission for investigation and recommendations, as they have done several times for issues in the Lake of the Woods and Rainy River Watershed.

The IJC can develop its own rules of procedure but must provide all interested parties an opportunity to be heard. The treaty provides for decisions by a majority of Commissioners, but IJC practice is to make decisions by consensus.

1925 Lake of the Woods Convention and Protocol

Beginning in 1887, prior to the time when international approval was required, dams were built in the outlets of Lake of the Woods to improve navigation and later to generate power. The effect of these dams was to raise the level of Lake of the Woods by about 3.5 ft (1.07 m) above natural conditions. There were numerous complaints of high water from south shore settlers in Minnesota. At the same time, other interests in both the U.S and Canada preferred the higher levels during navigation season. Low water conditions in 1910 and 1911 coupled with attempts by certain U.S. interests to divert some water from the Lake of the Woods watershed into Lake Superior, via Birch Lake, raised questions about future water supplies. In response, on June 27, 1912, the governments of the U.S. and Canada, pursuant to Article IX of the Boundary Waters Treaty, asked the IJC to consider the most advantageous use of the waters of the Lake of the Woods watershed and to make recommendations on lake regulation.

The IJC undertook extensive studies and submitted its final report to the governments in 1917, and on February 24, 1925, the governments signed the Lake of the Woods Convention and Protocol. It constitutes the bi-national arrangement for regulating Lake of the Woods outflows and, consequently, water levels.

While the convention deals with the entire watershed, it only includes provisions required to address the urgent issues of the day. To address unsettled future requirements, the governments included with the convention the text of a new request pursuant to Article IX of the Boundary Waters Treaty for the IJC to carry additional studies and recommend other measures for the governments to consider.

The convention says that the level of Lake of the Woods should ordinarily be held between 1056 ft. (321.87 m) and 1061.25 ft. (323.47 m) sea-level datum and that regulation should ensure the highest continuous discharge from the lake. Even during extreme high supply periods, the lake should not exceed elevation 1062.5 ft. These provisions constitute the only specific regulation goals in the convention.

The convention called for a Canadian Lake of the Woods Control Board to regulate the outflow from the lake. It also established a two-member International Lake of the Woods Control Board to be appointed by the two federal governments to approve regulation decisions when the level of the lake is above 1061 ft. or below 1056 ft. sea-level datum.

There is no provision in the convention for a formal review of regulation by governments to evaluate how interests in both countries have been affected over time.

To deal with possible flood damages resulting from elevated water levels, the convention called for a flowage easement up to elevation 1064 ft. sea-level datum around the lake in the U.S. It also provided that each country would be responsible for any past or future damages to its own inhabitants.

Finally, the convention provided that there should be no diversion of any water from the watershed to another watershed except by authority of the U.S. or Canada within their respective territories and with the approval of the International Joint Commission.

1914 Shoal Lake Diversion

In September 1914, while the IJC was investigating Lake of the Woods water issues, the IJC approved the request of the Greater Winnipeg Water District for permission to divert water from Shoal Lake for domestic and sanitary purposes. There was no upper limit specified for the amount of the diversion, but it was anticipated that in time it could range from 85,000,000 to 100,000,000 gallons per day. This diversion is still in operation, and the IJC retains jurisdiction over it.

1938 Rainy Lake Convention

While the Lake of the Woods Convention was being considered, private groups were developing general proposals for additional water storage in the watershed in Rainy and Namakan Lakes and in other lakes further upstream. As noted above, the governments referred this issue to the IJC for investigation and recommendations at the time the Lake of the Woods Convention was signed. Specifically, they asked the IJC to look at the most advantageous use of Rainy Lake and the boundary waters flowing into and out of Rainy Lake and whether it was practicable, taking into account all affected interests, to raise the upper limit of Rainy and Namakan Lakes.

During the course of the investigation, it became clear that interest in developing additional water storage capacity and water level regulation had waned, and there were no active proposals for specific projects. There was, however, concern in both countries about extreme high water levels on Rainy and Namakan Lakes. The IJC concluded that any future proposals could be formally considered if and when they were submitted for approval, but it did recommend that it be given authority to make regulatory decisions in certain circumstances. The governments agreed and entered into the 1938 Rainy Lake Convention. It authorized the IJC to determine when emergency conditions exist in the Rainy Lake watershed, due to high or low water, and to take regulatory action regarding the existing dams at Kettle Falls and International Falls as well as any future dams or works in boundary waters of the watershed.

The IJC has exercised this authority by issuing formal Orders to the owners of the dams setting forth the range of levels that must be met to assure that emergency conditions not occur, as well as other requirements, such as minimum outflows at International Falls/Fort Frances to protect fishery resources downstream. Regulation is overseen by the International Rainy Lake Board of Control. Originally composed of one federal official from each country, it now includes one local member from each

country. The first Order was issued in 1949. It has been formally reviewed and substantially revised three times, most recently in 2000. An additional review is currently being developed. Data-gathering activities are under way, with a target completion date of 2015. The formal review will begin at that time. The Board of Control works closely with the International Rainy River Water Pollution Board, including holding joint public meetings, taking joint watershed inspection trips and submitting joint reports to the IJC.

1959 Rainy River and Lake of the Woods Pollution

In 1959, the governments of Canada and the U.S. asked the IJC to study whether pollution in Rainy River and Lake of the Woods from municipal and industrial sources was causing injury to health or property in the two countries, and, if so, what should be done about it. Major studies were carried out by an IJC study board which included federal, state and provincial officials. In 1965, based on the board's report and public hearings, the IJC reported that Lake of the Woods water quality was satisfactory but that Rainy River was seriously polluted. The IJC recommended specific water quality objectives for Rainy River as well as programs and remedial measures by the municipalities and the paper companies to achieve them. The IJC also recommended that it be authorized to monitor and encourage implementation of the remedial actions and to review the water quality objectives and recommend amendments, as appropriate.

The governments agreed with the IJC's recommendations, and the IJC appointed the International Rainy River Water Pollution Board, composed of federal, state and provincial members. The board, at times with direct involvement by the IJC, strongly encouraged timely completion of remedial actions by the appropriate governments and private parties in each country.

The major remedial activities were completed by the 1980s, and the board continues to monitor water quality conditions in Rainy River and report to the IJC on major Rainy River Watershed developments. As noted above, it works closely with the International Rainy Lake Board of Control by holding joint public meetings, taking joint watershed inspection trips and submitting joint reports to the IJC.

1976 - IJC Alerting Responsibility

From time to time, the IJC has alerted the governments to issues of concern along the border. In 1976, governments acknowledged this practice and wrote that the IJC would be remiss in its duties if it were not to draw to the attention of governments such matters that came to its attention in the course of its normal activities. As one example, the proposed Namakan River power development was brought to the attention of governments in 2009 under this authority.

1998 International Watershed Initiative

In 1998, the governments asked the IJC to explore the development of international watershed boards to facilitate watershed-level solutions to transboundary environmental challenges by promoting communication, collaboration and coordination among the various stakeholders and interests using an integrated, ecosystem approach. Consistent with this request, the two Rainy boards have worked collaboratively with the paper companies and resource agencies to address peaking operations in the Rainy River for the protection of fish spawning and to remain aware of ongoing research initiatives and issues within the watershed.

2009 Lake of the Woods Multi-Agency Working Arrangement

This arrangement, which was established in 2009 by voluntary agreement of nine agencies from both Canada and the U.S (including seven resource agencies, one non-governmental organization and one US tribe.), seeks to foster trans-jurisdictional coordination on science and management activities to enhance and restore water quality in the watershed. Resource agencies and organizations in the watershed have committed to ongoing and new research projects aimed at identifying sources of nutrients to Lake of the Woods and to the Rainy River and sharing that information.

Sidebar: Lake Superior Binational Program/Lakewide Management Plan

Canada and the United States developed a bi-national program to restore and protect the Lake Superior Basin (LSBP) in 1991. The LSBP, comprised of a Zero Discharge Demonstration Program and a broader ecosystem program, has focused on the entire Lake Superior basin (that is, the lands and waters within its watershed boundary) and address all components of the ecosystem (air, land, water, wildlife and humans.) Participants include government and tribal agencies and interested groups from Michigan, Minnesota, Ontario and Wisconsin, along with both federal governments.

The Lakewide Management Plan (LaMP) is the main planning document developed through the LSBP. The LaMP addresses commitments made by Canada and the United States under the Great Lakes Water Quality Agreement to restore and protect beneficial uses and to maintain the chemical, physical and biological integrity of the basin ecosystem. All activities identified in the LaMP work plan are funded and implemented by the responsible agencies.

The Binational Program adds value to existing programs and activities by linking initiatives and coordinating efforts towards a common vision. The LSBP has developed ecosystem objectives for key elements of the Lake Superior ecosystem, including aquatic communities, terrestrial wildlife, habitat, human health, and sustainability; as well as indicators with quantitative targets to measure and report on the health of the ecosystem. Binational targets for chemical contaminants have also been established and are called “yardsticks”; they were derived by reviewing all applicable agency guidelines and selecting the most sensitive. Indicators have also been identified for reporting on progress in reducing chemical contaminants.

A governance structure has been established to oversee implementation of the LaMP:

1. The Task Force, which is comprised of senior government representatives to make policy decisions. The Task Force reports to the Binational Executive Committee which oversees implementation of the Great Lakes Water Quality Agreement.
2. The Binational Forum, which is a multi-sectoral group of 24 volunteers both citizens and interest group representatives, that provide analysis and advice.
3. The Superior Working Group (SWG), which is comprised of tribal and governmental agency technical experts who develop and implement LaMP projects and report on findings and progress.

Additionally, the SWG has five committees based on the Ecosystem Objective themes (Chemicals, Habitat, Aquatic Communities, Wildlife Communities and Developing Sustainability). In addition, there is a Communications/Public Involvement Committee, which has linkages to all of the theme-based committees. These committees are comprised of staff from the federal, provincial, state and tribal organizations within the Lake Superior basin.

The Lake Superior Binational Program continues today, as well as Lakewide Management Planning processes (and committees) for each of the other Great Lakes. The Binational Forum continues to be active, as does the SWG and its Committees, and the Task Force. The SWG organized a “Making a Great Lake Superior” Conference in 2007 and currently release LaMP Updates on a 3-year cycle.

Organizational Roles and Responsibilities

International Organizations

1. **International Joint Commission (IJC)** is a bi-national organization established by the Boundary Waters Treaty of 1909 between the governments of the United States and Canada. The IJC assists the governments in finding solutions in the boundary waters between the two countries, which respect the Boundary Waters Treaty. The IJC has six commissioners, three from each country. The IJC appoints Boards to assist it in carrying out its responsibilities. The International Rainy Lake Board of Control and the International Rainy River Water Pollution Board are two such IJC Boards in this watershed. The IJC has played a significant role in this watershed in the past, (see historical background section), and continues to do so. The International Lake of the Woods and Rainy River Watershed Task Force was appointed by the IJC to review bi-national governance in the watershed. In addition, the IJC has funded a number of local projects through its International Watersheds Initiative program.
   http://www.ijc.org/en/home/main_accueil.htm

2. **International Lake of the Woods Control Board (ILWCB)**, established by a 1925 Canada-United States of America Treaty (Convention and Protocol for Regulating the Level of the Lake of the Woods), approves the outflow from Lake of the Woods, whenever the level of the lake rises above or falls below certain elevations specified in the treaty. Its two members, one each, from the U.S. and Canada, work closely with the Lake of the Woods Control Board as the lake water levels approach those limits. For more information, see
   http://www.ijc.org/conseil_board/wood_lake/en/wood_home_accueil.htm

3. **International Rainy Lake Board of Control (IRLBC)**, created in 1947 by the IJC, monitors and may, at times, direct the regulation (water levels and outflows) of Namakan and Rainy lakes. Regulation is carried out jointly by the power companies in the United States and Canada in accordance with operating rules specified by the IJC. The board's members come from the U.S. and Canada, two each. Projects in the watershed include the coordination of studies on the impacts of the current IJC 2000 rule curves and collaboration with the IJC trans-boundary hydrographic data harmonization initiative. http://www.ijc.org/conseil_board/rainy_lake/rl_home_accueil.php?language=english .

4. **International Rainy River Water Pollution Board (IRRWPB)**, created in 1966 by the IJC, maintains continuing supervision over the waters of the Rainy River in relation to pollution, advising the IJC on the status of water quality in the River, any exceedances of jurisdictional water quality objectives, and other emerging issues. The Board has established Alert Levels for water quality on the Rainy River and reports on exceedances to the IJC. Its members come from the U.S. and Canada, two each. The IRRWPB and the IRLBC worked with the hydropower generating stations on the Rainy River and local fisheries biologists to create a voluntary peaking agreement which restricts hydropower peaking during the spawning period of bi-national stocks of walleye and lake sturgeon to reduce the impacts to these fisheries. For more information, see
   http://www.ijc.org/conseil_board/rainy_river/en/rainy_home_accueil.htm .

5. **Ontario – Minnesota Fisheries Committee** has existed in various forms since 1983 and operates under Revised Terms of Reference approved in 2000, is established to review and assess fisheries management on boundary waters of the two jurisdictions and make recommendations to the

respective governments that will manage and conserve the fisheries resources of the boundary waters. The Committee recognizes the sovereignty of each jurisdiction over their fisheries resources, while working towards cooperative management. The Committee has two members from the Minnesota Department of Natural Resources and two members from the Ontario Ministry of Natural Resources. It relies on technical/scientific advice, assessment and research information provided by local fisheries managers from both agencies, as well as staff from Voyageurs National Park. Sub-committees are established where necessary to address specific fisheries management issues (e.g., Lake Sturgeon Management, Rule Curve Monitoring, and Rainy River Peaking.)

6. **International Multi-Agency Working Group (IMA-WG)** was established in 2009 by voluntary agreement of nine organizations from both Canada and the U.S., including the Lake of the Woods Sustainability Foundation, Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency, the Ontario Ministry of the Environment, Environment Canada, the Ontario Ministry of Natural Resources, Manitoba Water Stewardship, Red Lake Band of Chippewa Indians, and the United States Environmental Protection Agency. The IMA-WG seeks to foster trans-jurisdictional coordination on science and management activities to enhance and restore water quality in the watershed. Resource agencies and organizations in the watershed have committed to ongoing and new research projects aimed at identifying sources of nutrients to Lake of the Woods and to the Rainy River and sharing that information. The **Technical Advisory Committee** (TAC) advises the work group and develops and implements joint work plans for research and monitoring activities. http://www.lowwsf.com/progress-we-are-making/multi-agency-arrangement.html

Domestic Organizations

1. **Lake of the Woods Control Board (LWCB)**, established in 1919 after studies of the watershed by the International Joint Commission (IJC), is responsible for the regulation of levels in Lake of the Woods and Lac Seul and flows in the Winnipeg and English Rivers downstream of these lakes to their junction. In addition, when the level of Lac Seul exceeds certain specified levels, the Board controls the diversion of water from Lake St. Joseph (Albany system) into Lac Seul. The 1925 Canada-United States Convention and Protocol for Regulating the Lake of the Woods assigned the responsibility for regulating the outflow from Lake of the Woods to this board of control. Its members come from Manitoba, Ontario and Canada. For more information, see http://www.lwcb.ca/ .

Aboriginals and Native Americans

1. **Tribes (in the United States)** have sovereignty over their own trust resources and lands and receive support from the U.S. Department of Interior Bureau of Indian Affairs. Programs for fisheries monitoring and stocking, wildlife research and management planning are conducted by the tribes and are supported by the Bureau of Indian Affairs and may occur at the level of a local tribe or at the agency level. The Red Lake Band of Chippewa Indians holds more than 67% of the lands located in the Northwest Angle of Lake of the Woods. The Red Lake Department of Natural Resources currently has an active water quality monitoring program to monitor water quality in the Northwest Angle and the tributaries which enter this. This data will be incorporated into the Minnesota Pollution Control Agency's (MPCA) Total Maximum Daily Load Study for Lake of the Woods. Bi-national activities include membership in the Multi-Agency Working Arrangement.

2. **First Nations (FN) (in Canada)** liaise with the Canadian Government via Indian and Northern Affairs Canada (INAC). Responsibility for environmental protection and management of natural resources is

transitioning to First Nations with a supporting role from INAC in the form of funding. One example is the Rainy River First Nations Watershed Program which has a goal to restore the ecosystem of the watershed both on the territory and on traditional lands on both sides of the border. Bi-national programs include stream monitoring with the MPCA and research on Lake Sturgeon stocks on the Rainy River with the University of Guelph and Minnesota Department of Natural Resources (MDNR). Watershed restoration has included cattle exclusion fencing on 25 km of the Rainy River. Shoal Lake #39 and #40 participated in the Shoal Lake Watershed Management Plan along with the provinces of Manitoba and Ontario and the federal government.

a. **Grand Council of Treaty #3** is the historical government of the Anishinaabe Nation in Treaty #3 and is the political government for the 28 First Nations in the treaty area. The Chief and Grand Council of Treaty #3 has a mandate to protect, preserve and enhance Treaty and Aboriginal rights. They liaise with non-aboriginal governments on Treaty rights and obligations, negotiate delivery agreements, evaluate government programs and policies, and provide education on Anishinaabe ideals, principles and priorities. http://www.gct3.net/

b. **Kenora Cheifs Advisory Council Ogimaawabiitong (KCA)** is an alliance of seven independent, participating First Nations within the Western Region which provides programs and services to First Nations in the field of health, education, and social services in a holistic, traditional way, including the creation of Community Public Health plans. http://www.kenorachiefs.ca/

3. **Métis Nation (in Canada)** liaise with the Canadian Government via Indian and Northern Affairs Canada (INAC). The Métis Nation of Ontario represents the collective aspirations, rights and interests of the Métis people and communities in Ontario. Local communities are represented by community councils, of which there are four in the Lake of the Woods and Rainy River watershed. The Métis have harvesting rights to natural resources, including activities such as hunting and fishing, within their traditional territory under a self governed management regime that includes the responsibility to preserve and protect those resources for future generations. http://www.metisnation.org/

Federal Agencies

1. **U.S. Department of State**, **(DOS)** is responsible for implementing U.S. foreign policy on behalf of the government of the United States, and in general for fostering and maintaining international relations with other countries. As such they act as a facilitator for other government departments in regards to international activities and may act as a liaison between U.S. government departments and their equivalents in countries such as Canada. They are a primary point of contact between the International Joint Commission and the U.S. government. http://www.state.gov/

2. **U.S. Environmental Protection Agency (EPA)** is mandated under the U.S. Clean Water Act of 1972 to protect the chemical, physical and biological integrity of surface waters nationally. The EPA manages the National Pollution Discharge Elimination System to set discharge standards and issue permits to facilities which discharge effluent into surface waters such as sewage treatment facilities and pulp and paper effluent, which it does in partnership with state agencies. Other activities include monitoring surface water quality, setting regulatory guidelines for industrial and municipal discharges under the EPA's 1987 Water Quality Act, setting water quality and bacterial criteria for

beach monitoring. The EPA is also mandated by the Safe Drinking Water Act of 1974 to set health based standards for substances in drinking waters and to protect sources of drinking water. Bi-national activities include participation in the Lake of the Woods Multi-Agency Working Arrangement. http://www.epa.gov

3. **U.S. Army Corps of Engineers (USACE)** is responsible for investigating, developing and maintaining water and related environmental resources in the United States. It provides public engineering services to the United States including flooding control, prediction and disaster response. The St. Paul District USACE is actively involved in a number of bi-national projects on the hydrology of the Rainy River and Rainy and Namakan Lakes watershed in conjunction with the IRLBC, Environment Canada, and USGS. It is an active member of the IRLBC and as part of this organization has been heavily involved in successive Rule Curve reviews for Rainy and Namakan Lakes including the current Plan of Study to evaluate the 2000 Rule Curves. http://www.usace.army.mil/Pages/default.aspx

4. **U.S. National Park Service (NPS), Department of the Interior** was created in 1916 to conserve the natural beauty, history and wildlife of the United States park lands for future generations with a philosophy of multiple use. There are 392 park lands in the National Parks system including 58 National Parks of which Voyageurs National Park is one. Voyageurs National Park staff is involved in a number of studies to monitor the impacts of water level regulations on the park's ecosystem. Recent studies include impacts of climate change on park ecosystems, water quality monitoring and a nutrient loading study of Kabetogama Lake in conjunction with the USGS. Bi-national activities include taking on a project management role, in cooperation with the IRLBC and IRRWPB and resource agencies on both sides of the border, to fill gaps identified in the Plan of Study to evaluate the IJC 2000 Rule Curves for Rainy and Namakan Lakes. Voyageurs National Park is a member of the Heart of the Continent Partnership and works closely with the Minnesota Department of Natural Resources and Quetico Provincial Park (Ontario Parks) on such activities as fire management. http://www.nps.gov/index.htm

5. **U.S. Geological Survey (USGS), Department of the Interior** is a federal science organization that conducts monitoring and research on environmental and ecosystem health, natural hazards, natural resources and the impacts of climate change and land-use change. Much of this is in support of programs and initiatives of other government federal and state agencies. USGS is mandated under the US Clean Water Act of 1972 and the Water Quality Act of 1987 to engage in science to protect the nations' water quality in cooperation with the US EPA and state agencies. The USGS is mandated under the Water Resources Act to collect information needed to manage and understand the water resources of the United States. The USGS monitors water quality across the country as part of the National Water Quality Assessment Program. In particular, it monitors sediment and water quality in the Rainy River watershed on a rotating basis and recently teamed with VNP to monitor water quality, sediment quality and stream flow from 22 sites affecting Kabetogama Lake to assess internal and external nutrient loads. The USGS also monitors flow in several locations of the Rainy River and its tributaries as part of the National Streamflow Information Program. Bi-national activities include partnerships with EC, USACE and the IJC on their stream gauging network on the Rainy River. They are a participating member of the IRRWPB and recently teamed with the IJC to install new flow gauges to better understand upstream water control in the bi-national waters of the Rainy River in conjunction with the IRLBC, IRRWPB, USACE and Environment Canada. They are also participating in the IJCs data harmonization initiative in the Rainy River watershed. http://www.usgs.gov/

6. **U.S. Fish and Wildlife Service (FWS), Department of the Interior** is mandated to manage and protect the fish and wildlife resources of the United States. Through the Fisheries Program, the U.S. Fish and Wildlife Service protects fish stocks and their habitats and includes programs such as the stocking of sport fish in lakes and streams. It administers and enforces the Endangered Species Act, and the Migratory Birds Act, with which it has an international treaty with the government of Canada. U.S. Fish and Wildlife's Endangered Species Program protects federally listed species under the Endangered Species Act of 1973, including protections for listed species in the watershed such as piping plovers nesting on Lake of the Woods. The Fish and Wildlife Coordination Act also mandates the Fish and Wildlife Service to evaluate the impacts of proposed water resources development projects to fisheries. Bi-national activities include collaborative work with MN-DNR and the Rainy River First Nation to enhance bi-national Lake Sturgeon stocks by raising eggs and releasing fingerlings. http://www.fws.gov/

7. **Bureau of Indian Affairs (BIA), Department of the Interior** is mandated to enhance the quality of life, to promote economic opportunity and to carry out their responsibility to protect and improve the trust assets of American Indians, Indian tribes and Alaska Natives. These trust resources include treaty rights such as hunting and fishing and exist both on reserves and on ceded tribal lands where treaty rights to resources are held by tribes. The Bureau acts in a supporting role to tribes who hold sovereign control over their own resources. The Division of Natural Resources is responsible for providing support in the protection of trust resources such as water, fish, wildlife, and agricultural land use by tribes. The Wildlife and Parks program supplies funding for tribal projects on fisheries, wildlife, outdoor recreation, and conservation enforcement. The Fish Hatchery Operations and Maintenance Programs provide funds for fish stocking, rearing and other fisheries maintenance programs by tribes. Bi-national activities include participation with U.S. tribes on the Great Lakes Watershed Restoration Initiative. http://www.bia.gov/

8. **U.S. Forest Service (FS), Department of Agriculture** manages National Forests under the principles of ecosystem management and multiple use. The Forest Service manages the federal land and waters of the Superior National Forest which includes the Boundary Waters Canoe Area Wilderness under the Boundary Water Wilderness Act of 1964. Services delivered include special use authorities, fire management and the maintenance of habitat and water quality. It does not manage hunting and fishing within the National Forest, as this is done by MDNR. Bi-national activities include collaboration with Voyageurs National Park and Quetico Provincial Park on cooperative fire suppression activities on both sides of the border. It is also a member of the Heart of the Continent Partnership. http://www.fs.fed.us/

9. **Natural Resources Conservation Service** (**NRCS), Department of Agriculture** encourages conservation stewardship on private lands through the 2008 Farm Bill Act. The NRCS's Highly Erodible Land Conservation and Wetland Conservation Compliance Program promotes water quality by tying Farm Benefit funds to farming Best Management Practices that reduce soil erosion and are protective of surface water quality. Currently NRCS is working to improve water quality through erosion control on private lands in the Lake of the Woods and Rainy River district through conservation practices such as conservation buffers, access control with fencing, residue management, nutrient management, prescribed grazing, reforestation, animal waste management systems and stream bank protection. NRCS and partner agencies are conducting a study of the Bostic and Zippel Bay watersheds to determine sources of sediment loads to Lake of the Woods. The study will include recommendations for land treatment practices to reduce sediment loads. http://www.nrcs.usda.gov/

10. **U.S. Farm Service Agency (FSA), Department of Agriculture** serves farmers, ranches and agricultural partners through the delivery of effective, efficient agricultural programs. They support and provide assistance to farming communities through their farm commodity programs, farm credit, disaster assistance programs and farm loan programs. The Conservation Reserve Program is a voluntary program to encourage landowners to adopt conservation practices which reduce water run-off and sedimentation in conjunction with NRCS. They also encourage the retirement of environmentally sensitive agricultural land. The Farmable Wetlands Program encourages the voluntary restoration of farmable wetlands. Their Source Water Protection Program is designed to prevent source water pollution from agricultural sources through the development of Rural Source water protection plans. http://www.fsa.usda.gov/

11. **U.S. National Weather Service (NWS) National Oceanic and Atmospheric Administration** provides weather, hydrologic, and climate forecasts and warnings for the United States, for the protection of life and property, and for the enhancement of the national economy. They are responsible for forecasting water levels, particularly flood conditions. The NWS is a request based organization, and responds to requests from communities for water level forecasting services. In our watershed, the NWS would respond to a request from a local community for a river forecast through the local NWS office in Duluth, MN. Although they are not currently forecasting on the Rainy River, they have done forecasting of water levels on the Souris and Red Rivers. They work closely with Canadian flood forecasters on bi-national waters and provide expertise to the province of Manitoba. They also work closely with Manitoba Water Stewardship. http://www.weather.gov/

12. **U.S. Federal Emergency Management Agency (FEMA), Department of Homeland Security** is mandated to support citizens and emergency first responders to build, sustain, and improve the capability to prepare for, protect against, respond to, recover from, and mitigate all hazards. Through the Disaster Relief and Emergency Assistance Act and the Homeland Security Act, FEMA assists and coordinates the federal response to disasters in the U.S. which exceed the capacity of local and state agencies and a state of disaster is declared. They also provide advice on building codes and flood plain management to mitigate the impacts of flooding and other natural disasters and manage the National Flood Insurance Program. They assist local and state agencies on emergency preparedness, provide disaster relief and help support the nation's fire service. http://www.fema.gov/

13. **Department of Foreign Affairs and International Trade Canada (DFAIT)** manages Canada's diplomatic and consular relations with other countries, and to encourage international trade. Under the Department of Foreign Affairs and International Trades Act they are responsible for developing and advancing foreign policy objectives on behalf of the Canadian government to enhance economic opportunity and security. They may also act as a liaison between other Canadian government departments and those in the U.S. They are the main formal point of contact between the Canadian government and the IJC and are involved in appointing Canadian commissioners to the IJC and drafting references to the IJC on behalf of the government of Canada. DFAIT and the Department of State work closely together, in conjunction with the IJC, on matters affecting international boundary waters. http://www.international.gc.ca

14. **Environment Canada (EC)** has a responsibility to protect the integrity of domestic waters in cooperation with provinces and territories under the Canada Water Act, the Environmental Protection Act and the Department of the Environment Act. They are also involved in environmental

impact assessments of development projects which impact waters or ecosystems in federal waters through the Environmental Assessment Division. Environment Canada has a mandate to monitor water quality and conduct science to support decision making in trans-boundary waters such as Rainy River and Lake of the Woods. Through their National Hydrometric Program the Water Survey Division is responsible for the collection, interpretation, and dissemination of water quantity data in Canada. Environment Canada measures water quantity and flow in the Rainy River and Rainy Lake Watersheds and creates predictive models of water availability and flooding in collaboration with US partner agencies such as the USGS and US Army Corps of Engineers. Environment Canada is conducting research on Lake of the Woods in collaboration with the International Multi-Agency Working Arrangement, as part of ECs Lake of the Woods Science Initiative to better understand nutrient dynamics in Lake of the Woods and the influence of this on harmful algal blooms. EC is also in the process of establishing the baseline status of the benthic community of the lake as key indicators. EC is a participant of the IRLBC, the ILWCB, the IRRWPB, the LWCB and ILWCB, and the International Multi-Agency Working Group and Technical Advisory Committee. http://www.ec.gc.ca/

15. **Indian and Northern Affairs Canada (INAC)** is responsible, along with Band councils and Health Canada to ensure the provision of safe drinking water and waste water services to the First Nations and the Métis Nation through the Indian Act. They provide funding towards drinking water and waste water infrastructure and training through the First Nations Water and Waste Water Action Plan. They are also the agency involved in the settlement of First Nations land claims in the watershed. http://www.ainc-inac.gc.ca/index-eng.asp

16. **The Department of Fisheries and Oceans (DFO)** delivers programs and services to support the sustainable use and development of safe and accessible waterways, healthy and productive aquatic ecosystems and sustainable fisheries in Canada. Under the Fisheries Act the department is mandated to protect fisheries and fish habitat and is therefore involved in the evaluation of the potential impacts of proposed developments to fisheries and fish habitat. They are a member of the Lake Sturgeon Recovery Team, a species at risk in the Lake of the Woods and Rainy River watershed. Bi-national activities include membership on the Peaking Working Group, which includes representatives from the power companies who operate the dams at Fort Frances/International Falls as well as MNDNR. This group has developed and maintained a voluntary agreement to suspend peaking for hydro generation during the spring spawning periods of lake sturgeon and walleye in the bi-national waters of Rainy River. The Canadian Coast Guard is a division of DFO. They are responsible for navigational aids on Canadian waterways such as the Canadian portion of Lake of the Woods. http://www.dfo-mpo.gc.ca/

17. **Health Canada (HC)** is the federal department responsible for helping Canadians maintain and improve their health. The Pesticide Management Regulatory Agency is a division of Health Canada which is responsible for assessment and regulation of pesticides and their use under the Pest Control Products Act. Health Canada also shares responsibility with First Nations Band Councils and INAC to ensure safe drinking water supplies and the provision of waste water treatment programs to First Nations through their Environmental Public Health Program. They are responsible for monitoring and permitting of discharges from First Nations waste water treatment facilities including in Lake of the Woods and Rainy River. Health Canada reports the concentrations of nutrients, BOD and other compounds in sewage discharges from these facilities to the IRRWPB which are included in their semi-annual report to the IJC. http://www.hc-sc.gc.ca/

18. **Agriculture and Agri-Foods Canada (AAFC)** provides information, research and technology to achieve an environmentally sustainable agricultural sector. They deal generally with terrestrial agricultural ecosystems. They set voluntary Agricultural Best Management Practices to mitigate potential negative impacts of agriculture to surface and ground water quality. Implementation of BMPs is largely done through the provincial agricultural agencies. Bi-national activities include Agriculture Canada's involvement in the Lake Winnipeg Initiative on practices to reduce nutrient inputs into the Red River and participation on the International Red River Board. http://www.agr.gc.ca/

State/Provincial Agencies

1. **Minnesota Pollution Control Agency (MPCA)** is mandated under the US Clean Water Act to protect the chemical, physical and biological integrity of Minnesota surface waters. MPCA administers requirements for storm water and waste water discharges under the Clean Water Act, issuing permits for municipal, construction and industrial storm water facilities through the Storm Water Program. They manage and monitor waste water discharges through the NPDES in conjunction with the US EPA. MPCA sets guidelines and monitors for microbial contamination of beaches for Minnesota's Beach monitoring program. In cooperation with MDNR and the Minnesota Department of Health, the MPCA monitors contaminant body burdens in sport fish and issues fish consumption advisories. As part of their Intensive Watershed Approach Program they assess water and biota for impairments on the Rainy, Little Fork, and Big Fork Rivers. Through their Major Watershed Load Monitoring Program they monitor long term trends in water quality in the Rainy, Little Fork, Big Fork, Vermillion and Rapid Rivers. Bi-national activities include participation on the IRRWPB and the International Multi-agency Working Group and Technical Advisory Committee where they work cooperatively with other US and Canadian agencies to implement a nutrient loading study for Lake of the Woods. They also created the 2004 Rainy Basin Plan. http://www.pca.state.mn.us/

2. **Minnesota Department of Natural Resources (MDNR)** works with citizens to conserve and manage the state's natural resources, provides outdoor recreation opportunities, and provides for the commercial use of natural resources in a sustainable way. They are responsible for floodplain and shoreline management through the DNR Waters Floodplain Management Program and the DNR Waters Shoreland Management and are the permitting agency for shoreline development, fish removal, dams, aquatic plant control and public waters work. They manage and operate Minnesota's State Parks such as Lake Vermilion State Park. They manage and protect state fish and wildlife resources including within the boundaries of Superior National Forest, including restoration projects to improve habitat and water quality. They are involved in the monitoring and control of aquatic invasive species in the Lake of the Woods water shed. They monitor fisheries in state waters including those of Lake of the Woods, Rainy and Namakan Lakes and are involved in bi-national monitoring of Lake Sturgeon and walleye stocks with OMNR in the Rainy Watershed. Other bi-national activities include membership on the Ontario-Minnesota Fisheries Management Committee and the Peaking Working Group as well as the International Multi-Agency Working Group and Technical Advisory Committee. They are also participating in a number of studies, in cooperation with OMNR and VNP to assess the impacts of the IJC 2000 Rule Curves for Rainy and Namakan Lakes on fish habitat and typically attend the annual IRLBC/IRRWPB resource agency meeting in August. http://www.dnr.state.mn.us/index.html

3. **Minnesota Department of Health (MDH), Environmental Health Division, Hazardous Sites and Substances Assessment and Consultation Unit** is charged with preventing or reducing exposures to

spills, hazardous sites and toxic substances. It is also responsible for setting state wide safe drinking water guidelines and issue permits for well construction. It issues state wide Safe Eating Guidelines for Fish and collaborates with fish consumption guidelines in cooperation with MDNR and MPCA. http://www.health.state.mn.us/divs/eh/

4. **Minnesota Department of Agriculture (MDA)** is the state agency responsible for all aspects of pesticide and fertilizer environmental and regulatory functions. Under Minnesota's Clean Water Legacy Act they also fund projects to improve water quality. Their Agricultural Best Management Practices Program for fertilizer and pesticide use is protective of surface waters. The state has also passed and enforces the Phosphorus Lawn Fertilizer Law of 2007 which restricts the use of lawn fertilizers containing phosphorus to reduce nutrification of surface waters. http://www.mda.state.mn.us/

5. **Minnesota Department of Transportation (MnDOT)** is responsible for providing and maintaining the highest quality, dependable transportation system for the state of Minnesota. As such they are responsible for maintaining transportation structures in the watershed and mitigating their impacts on water quality and hydrology. They are currently reviewing a proposal to rehabilitate or replace a bridge over the Rainy River at Baudette. This is being done cooperatively with the Ontario Department of Transportation in consultation with the Lake of the Woods Control Board to ensure that there are no adverse effects to water flow. http://www.dot.state.mn.us/

6. **Ontario Ministry of the Environment (OMOE)** is a regulatory agency tasked with protecting, restoring and enhancing the natural environment to provide Ontarians with safe and clean air and water through the Environmental Protection Act, and the Ontario Water Resource Act. Their mandate includes the pro-active inspection of sites that may pollute air, land or water. As part of the Lake of the Woods initiative the Kenora area office has been pro-actively inspecting septic systems of resorts on Lake of the Woods to reduce nutrient inputs into the lake. They work cooperatively with the Ontario Ministry of Natural Resources (OMNR) to sample contaminant body burdens in Ontario sport fish and publish site specific fish consumption guidelines. Their Lake of the Woods Watershed Stewardship Strategy mandates them to look at water quality and its management locally on a watershed basis. Activities include monitoring water quality in Ontario tributaries entering Lake of the Woods and the Rainy River, as part of the MOE Tributary Monitoring Program. This has been an important component in generating nutrient loadings for Lake of the Woods in cooperation with MPCA and university partners. In the Lake of the Woods and Rainy River watershed, they monitor water quality in collaboration with international partners such as MPCA as part of the Multi-Agency Working Arrangement, making this an international effort in Scope. They are also a member of the IRRWPB. http://www.ene.gov.on.ca/environment

7. **Ontario Ministry of Natural Resources (OMNR)** promotes healthy, sustainable ecosystems and works to conserve biodiversity. They conduct scientific research and apply the findings to develop effective manage natural resources in a sustainable fashion through the Fish and Wildlife Conservation Act, the Lakes and Rivers Improvement Act, the Ontario Fishery Regulations under the Fisheries Act, the Aggregate Resources Act, the Ontario Parks Act, and the Forest Fire Prevention Act. They manage Ontario's Crown Land through the Public Lands Act, and the Crown Forest Sustainability Act, which makes up a significant portion of land in Central and North Western Ontario and their jurisdiction includes all inland waters in the Fort Frances District in addition to Rainy River, Rainy Lake and Namakan Reservoir. As such they provide advice on regulation of flows and levels for the Namakan Reservoir, Rainy Lake, Seine River and Rainy River. They are the owners

and operators of water control structures on the Manitou River, Footprint River and Big Canoe River. They participate with OMOE in sportfish contaminant monitoring and reporting programs. They also operate **Ontario Parks** such as Quetico Provincial Park, Turtle River – White Otter Waterway Park, numerous nature reserves, natural environment and conservation reserves such as the Rainy Lake Islands. They are responsible for fisheries management including allocation, population assessment and inventory, objective setting and planning, disease surveillance, contaminant monitoring, commercial food and bait fish management. Bi-national activities include participation on the IRRWPB and the Ontario-Minnesota Fisheries Committee as well as the International Multi-Agency Working Group and Technical Advisory Committee and they are engaged with the Heart of the Continent Partnership. http://www.mnr.gov.on.ca/

8. **Ontario Ministry of Municipal Affairs and Housing (MMAH)** is responsible for planning and zoning particularly in the unincorporated areas of the province of Ontario. Through Section 3 of the Planning Act, the Provincial Policy Statement (PPS) sets the policy foundation for regulating the development of and use of land in Ontario. Section 2.2 of the PPS contains policies to protect, improve, or restore the quality and quantity of water. Planning applications which must be approved by a number of agencies such as OMOE, local municipalities and the Lake of the Woods Control Board, are coordinated by the MMAH. They are currently updating the PPS and are consulting with other provincial agencies and stakeholders to ensure the PPS is up to date with other interests. http://www.mah.gov.on.ca/

9. **Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)** priorities are to support a strong rural economy, promote healthy agriculture and food sectors through the wise use of rural Ontario's land and water resources while enhancing the protection of the natural environment. In cooperation with AAFC, they promote the adoption of agricultural Best Management Practices, to reduce impacts to water quality from agriculture. In conjunction with the Ontario Ministry of the Environment they are also responsible for overseeing nutrient management planning and compliance in the storage and application of nutrient rich materials such as sewage sludge and manure under the Nutrient Management Act. http://www.omafra.gov.on.ca

10. **Ontario Ministry of Transportation (MTO)** priorities are to provide a transportation structure to move people and goods that is safe, efficient, and sustainable. They are responsible for maintaining provincial transportation structures in the water shed. They work with appropriate state and federal agencies on both sides of the border on transportation structures which cross trans-boundary waters; these include bridges which serve as border crossings. Currently they are working with MNDOT on a bridge which crosses the Rainy River at Baudette. http://www.mto.gov.on.ca/english/

Local Governments

1. **Counties (U.S.):** U.S County zoning offices issue permits, as described in local zoning ordinances. Local ordinances generally address building standards, floodplain regulations, shore land regulations, and other development issues. These plans and ordinances allow the counties to enforce management practices such as controlling erosion, managing storm water and preventing sewage effluent from entering the water. Counties work in conjunction with adjoining counties and state agencies to create river plans and ordinances which apply to the Rainy, Rapid, Big Fork, Little Fork and Rat Root River. This lead to the creation of River Management Boards for the Big Fork and Rainy/Rapid Rivers. The counties work with SWCDs, MDNR, and NRCS to create local water management plans for each county.

2. **Cities and towns (U.S.):** Responsible for waste water treatment and disposal and water treatment infrastructure within their boundaries in conjunction with local Sanitary Sewer Districts. They are also responsible for land use and zoning regulations within their geographic mandate. These include regulations for the protection of wetlands as based on the Minnesota Wetland Conservation Act. The City of International Falls is a participant of the Namakan Basin Sanitary Sewer Initiative (see accomplishments section) involved in sewering properties on lakes in the Namakan watershed to protect water quality.

3. **Cities/Townships (Canada):** Municipal government units responsible for regulating land use through local zoning ordinances and for waste water treatment and disposal and water treatment infrastructure. Cities and townships formulate a plan for development within their geographic mandate. Un-incorporated areas fall outside of this mandate. These plans have land use policies which impact shoreline development, drainage, docks, preservation of vegetation, land division, flood hazard land, and development on sensitive areas, open spaces, and natural areas. The City of Kenora has an Official Plan for development that incorporates environmental protection and the maintenance of water quality as does the Township of Sioux Narrows-Nestor Falls. Some cities and townships communicate with the Lake of the Woods Control Board three times a year at its regulation meetings.

4. **Soil and Water Conservation Districts (SWCD):** In the United States, Soil and Water Conservation Districts are local units of government which direct natural resource management programs at the local level in conjunction with landowners and other units of government to carry out programs for conservation use and development of soil, water and related resources. They may issue permits for activities such as filling and draining wetlands, which are covered under the Wetland Conservation Act and shoreline stabilization projects. Specific projects in the watershed include the Big Fork River Target Watershed Assessment by the Lake of the Woods and Koochiching SWCDs; collecting water chemistry and other parameters at Big Fork, Bear, and Sturgeon River; monitoring of water quality for phosphorus and chlorophyll for 6 Cook County lakes in partnership with the Cook County Lakes Association and the Citizen Lake Monitoring Program; and collaborating with MPCA on water quality monitoring of Lake of the Woods, Baudette, Manitou, Rapid and Big Fork Rivers as part of Intensive Watershed Monitoring Program. http://www.maswcd.org/

5. **Northwestern Health Unit (NHU)** serves the Kenora and Rainy River districts in Ontario, Canada. Their mandate is to promote health and quality of life in the communities within this district. They are mandated under Ontario Public Health Standards and Ontario's Small Drinking Water System legislation to protect the health of the public from waterborne illness or injury related to drinking water and recreational use in the Lake of the Woods and Rainy River districts. Within this district they implement the Part 8 Private Sewage System Program to ensure that sewage is properly treated. They issue permits and perform inspections for sewage systems as directed under the Building Code Act. They have responsibility for sewage permitting for all private residences within this district as well as commercial operations with a maximum daily flow rate of 10,000 liters per day or less. http://www.nwhu.on.ca/

6. **Non-Government Organizations (NGOs)** are not-for-profit groups which operate independently of governments. In this watershed, NGOs have been instrumental in grass roots efforts to promote stewardship and education, lobby governments, collect and disseminate information. They have worked with local agencies and other NGOs on cooperative projects in the watershed, such as water

quality on Lake of the Woods (see accomplishments section). NGOs in the watershed include the Lake of the Woods Water Sustainability Foundation, the Lake of the Woods Property Owners Association, Rainy Lake Conservancy, Heart of the Continent, The Rainy River Soil and Crop Improvement Association, the Quetico Foundation, the Cook County Coalition of Lakes Association, Friends of the Boundary Waters Wilderness, and the Nature Conservancy.

Sidebar: The Lake Champlain Basin Program

The Lake Champlain Basin Program (http://www.lcbp.org/) is an ongoing, non-binding, collaborative effort by the state, provincial, and U.S. federal governments in the Lake Champlain watershed to restore and enhance the ecological health of the watershed.

In 1988 the Governors of Vermont and New York and the Premier of Quebec initiated a creative approach to cooperative watershed management by signing the Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain. This agreement created a mechanism for the exchange of scientific information, encouraged cooperative planning for environmental protection, established the Lake Champlain Steering Committee with diverse representation from the three jurisdictions, established citizens advisory committees, and provided for renewal of the agreement every four years.

In 1990 the Lake Champlain Special Designation Act was passed in the U.S. It, along with important amendments in 2002, has provided strong ongoing financial and institutional support to the work started by the states and province. Specifically, the law established the Lake Champlain Basin Program and charged it with developing a watershed management plan and establishing the technical and education and outreach advisory committees. It also authorized funds to support the implementation of the program.

Since 1988, there have been several renewals of the Memorandum of Understanding between Quebec, Vermont and New York as well as separate Memoranda of Understanding between two of the Parties on specific issues. Of particular note is a 2002 Missisquoi Bay Phosphorus Agreement between Vermont and Quebec which determined a division of responsibility between Vermont and Quebec for phosphorus load reduction in that bay. Also, the 2010 revision to the larger Memorandum of Understanding commits the Parties, where practicable, to provide prior notification and opportunity for consultation to each other on any pending major action which could affect the environmental quality of Lake Champlain.

The Steering Committee and the advisory committees are supported by a core group of professional staff. This staff manages funds received from U.S. federal sources, facilitates coordination and collaboration among committee members, carries out specific program activities and manages contracts and grants to other entities that are implementing parts of the programs.

The management plan for the Lake Champlain watershed is called Opportunities for Action. The recently completed, current version is available on the Basin Program's website. It is comprehensive and detailed and reflects the current thinking of the Program partners. Key issues include: reducing phosphorus inputs to Lake Champlain; reducing contaminants that pose a threat to human health and the Lake Champlain ecosystem; preventing the introduction, limiting the spread, and controlling the impact of non-native aquatic invasive species; identifying potential changes in climate and developing appropriate adaptation strategies; and promoting healthy and diverse economic activity and sustainable development principles within the Lake Champlain Basin while improving water quality and conserving the natural and cultural heritage resources on which the regional economy is based.

All Lake Champlain Basin Program meetings are open to the public.

Accomplishments

Bi-national management of waters within the Lake of the Woods and Rainy River watershed has seen a considerable number of successes over the years, some of which can be attributed to the IJC, some to various levels of government and some to grassroots organizations throughout the watershed. In the short time of the Task Force's tenure, it has gained a heightened awareness of many of these accomplishments, all of which have a goal of protecting the resources and positively influencing that protection through cumulative improvements. Successes ranged from the large-scale, effective cleanup of the Rainy River to the more subtle enhancements of communication between Boards and communities and increased recognition of the need for local input to solve local issues. While by no means comprehensive, this section provides an overview of many accomplishments achieved throughout the watershed.

1. Improvements in Water Quality

At one time, the Rainy River was extremely polluted with the human waste, bark, lime and sulphite solutions from the two pulp and paper mills at Fort Frances and International Falls and municipal treatment facility discharges entering the river untreated. The 1950s found the river in its worst shape. In the early 1960s, at the request of the U.S. and Canadian governments, the IJC conducted a comprehensive study of the river and recommended water quality objectives, remedial measures to be completed in each country, and ongoing monitoring of the situation in the future by the IJC. With the installation of sewage treatment, bark handling facilities, sulphide mill shut-downs and the initiation of the IJC's International Rainy River Water Pollution Board (IRRWPB), the river gradually showed improvements by the end of the 1960's and significant improvements were seen by the 1980's. For example, biological oxygen demand (BOD) levels in the Rainy River in 1968 were 74 metric tonnes/day; by 1976, they had dropped to 50 metric tonnes/day; by 1982 they had gone down to 13 metric tonnes/day and by 2009, had decreased to 3.6 metric tonnes/day. The water quality objectives recommended by the IJC in its study mentioned above set limitations for waste water (pulp and paper and sewage) for parameters such as E coli, suspended solids, dissolved oxygen and nutrients (though vague). Once the IRRWPB was established, pressure from both the IJC and the IRRWPB further enhanced the cleanup of the river over time. In order to maintain acceptable phosphorus (and other nutrients and contaminants) levels in the river, for which objectives had not been established as part of the IJC study, the IRRWPB instigated "alert" levels for the river in 1992. The alert levels represented levels stated as guidelines or objectives of regulatory agencies with jurisdiction on the river; the alert levels chosen were the most stringent of those used by the agencies. To this day, provincial/state agencies and industries on both sides of the border monitor effluent from sewage treatment plants, the mills and other facilities to ensure they are complying with environmental regulations. Results are reported back to the IJC in an effort to keep abreast of how facilities on both sides of the border are adhering to water quality objectives and these alert levels for the river. The IRRWPB posts the results via their biannual reports on their website for public access.

1.1 *Water Quality Monitoring Efforts*

1.1.1 <u>Aquatic Synthesis for Voyageurs National Park (VNP)</u>

An Aquatic Synthesis for VNP was published in 2003, which summarized the results of research completed and further assessments needed in the aquatic environments of the boundary waters in and

around the park. There is an aggressive water quality-monitoring program in boundary waters associated with Voyageurs National Park.

1.1.2 State of the Basin Report and Subsequent Studies/Monitoring Efforts on Lake of the Woods

In 2009, the first ever "State of the Basin Report for the Lake of the Woods and Rainy River Basin" was published and provided an overview of environmental conditions in the watershed, the existence of data and the gaps in information that exist in order to understand water quality issues in the watershed. This report was a collaborative effort between the LOWWSF, MOE, MPCA and EC and triggered a number of significant research projects as a result, including the Lake of the Woods Nutrient Budget Study which was an attempt to quantify nutrient loads entering and leaving the lake. One of the significant data gaps identified in the State of the Basin Report, and a requirement for a comprehensive nutrient budget to be accomplished, was monitoring data from Canadian tributaries to Lake of the Woods and the Rainy River. In 2008, Environment Canada came on board with a comprehensive sampling initiative on the lake and the Rainy River that has focused on monitoring nutrients, mercury, algae and benthos as well as determining algal composition on Lake of the Woods. In 2009, the MOE commenced a targeted sampling program to measure nutrient concentrations in 9 tributaries and the outflow to the Winnipeg River. MPCA's tributary and lake monitoring program has been ongoing and reached full force in 2010 when sampling for their Total Maxmimum Daily Loads study started in response to algae and phosphorus levels in Lake of the Woods being above state standards.

1.1.3 Citizen-Based Monitoring

There are numerous citizen-based monitoring projects throughout the watershed in which members of the public take samples on a regular basis and submit them for analysis. In this way, a substantial database can be developed for lakes otherwise not monitored. Examples include the MOE's Lake Partner Program (33 samplers on Lake of the Woods alone) and the Cook County Coalition of Lake Association's sampling program, which currently involves 12 samplers in this watershed (personal communication, B. Clark, 2011).

1.1.4 Local Agency Contributions

Many agencies and organizations are contributing to the understanding of water quality and ecosystem health issues within the watershed. As part of the Lake of the Woods Water Quality Forums in 2008 and 2009, information on who was monitoring where and how in the watershed was collected. The information revealed that at least one dozen agencies/organizations were conducting some kind of water quality sampling in the watershed, with many more entities researching the fishery, benthos, precipitation trends, and paleolimnology and conducting modeling exercises on Lake of the Woods or the Rainy River.

2. *Enhanced Communication and Local Involvement*

2.1 IJC Presence in Watershed

After the Rainy River cleanup, during the 1970's and early 1980's the IJC and the IRRWPB had a reduced presence in the watershed. Resource, business and other groups individually sought out the IRLBC to find a path to the solutions each group wanted in water level management locally. At this point, the IJC and the IRLBC began to foster the joining of disparate interest groups to come together to reach a compromise for the good of the watershed and its interest groups.

Beginning in the late 1980's, the IRLBC made several tours throughout the Rainy River Watershed and encouraged concerned groups to come together to speak with one voice as a collective. In essence, these meetings fostered a greater understanding of a watershed concept. It was also the birth of the

watershed initiative in the watershed according to those with corporate memory. In addition, in response to comments from the public in the late 1980's, the Board had decided that it should attempt to inspect a portion of the watershed each year prior to the Public Meeting. The purpose would be to gain more first-hand knowledge of current conditions and public concerns. This concept was implemented in 1988.

In the early 1980's, following public consultation, the Lake of the Woods Control Board (LWCB) implemented new policies to include the participation of First Nations and other local interests in the management of the waters regulated under its mandate. First Nations, Specific Interest Groups and Resource Advisors were invited to participate in all regulation meetings of the Board.
Similarly, in early 1998, the LWCB launched a comprehensive web site to provide the public and others with current watershed conditions, as well as technical and historical information related to the water management of the Winnipeg River watershed. This web site has been instrumental in increasing public awareness of, and participation in, the water level and flow management of Lake of the Woods and the Winnipeg River downstream.

Enhanced coordination led to the development of a bi-national steering committee (established in 1991) to promote rule curve changes on the Rainy Lake and Namakan Reservoirs that would favor more natural flows such as in Lac La Croix, an unregulated border lake. It stimulated much discussion among proponents and opponents about the proposed changes. The "Rainy Lake / Namakan Chain International Water Level Steering Committee" held many meetings across the watershed with First Nations and other groups to develop a proposal for rule curve changes for Rainy Lake and the Namakan Chain of Lakes. Its work was brought to the attention of the IJC, which commissioned additional studies, established new rule curves in 2000, and specified that further review would occur by 2015. A 2009 Plan of Study was prepared to identify gaps in research to develop a final document for a 2015 IJC review of the 2000 rule curve changes on the Rainy and Namakan Reservoirs. Recommended studies are currently being funded by the IJC through its International Watershed Initiative. The IRRWPB and IRLBC have plans to secure a POS project manager and are working with resource agencies and others to hire researchers to complete the studies.

Compared to decades in the past, the IJC and its boards (IRRWPB and IRLBC) have fostered a significant dialogue and presence in the watershed today and have significantly increased local outreach and involvement. Commissioners now come to the watershed annually and are readily available to the public at meetings and on field trips. Resource agencies in both countries are invited annually to a forum with the Commissioners and Boards in an environment where they can freely discuss watershed management issues. The IRLBC was expanded in 2004 to add two local representatives from within the watershed. Board engineering advisors continue to work closely with paper company dam operators.

3. *Proactive Protection Measures*

3.1 Legislative Changes

As air and water pollution became increasingly serious in Canada and the United States in the 1950s and 1960s, comprehensive environmental laws and regulations were promulgated and new federal, state and provincial institutions were established that have helped address many issues in the Lake of the Woods and Rainy River watershed. The establishment of agencies such as the Minnesota Pollution Control Agency in 1967, the U.S. Environmental Protection Agency and Environment Canada in 1970, and the passing of legislation such as the Canadian Environmental Protection Act in 1971, the U.S. Clean Water Act of 1972, and the Ontario Water Resources Act in 1972, represent major milestones in

improving water quality in the watershed. Taken together, these provisions cover most municipal and industrial point sources. Non-point sources, including the atmospheric deposition of phosphorus, runoff into tributaries and legacy pollutants, such as nutrient loadings in lake and river sediments, have not been as fully addressed.

Significant new efforts are also currently being made in both countries. Minnesota is in the midst of a "Total Maximum Daily Load" study for Lake of the Woods in response to the portion of this water body in the United States being declared "impaired" for phosphorus and algae. Canada and Ontario are partnering on research initiatives and communicating with Minnesota to support study. Ontario's Lake of the Woods Watershed Stewardship Strategy focuses on science, compliance, outreach/communication, partnership-building and international cooperation to ensure that approaches used in Ontario to promote best management practices and research initiatives are aligned with Manitoba and Minnesota's goals. In fall of 2008, Minnesotans passed The Clean Water, Land and Legacy Act, an amendment to the state's constitution that created a three-eighths of a percent sales tax to fund, among other things, the protection and preservation of Minnesota's freshwater. The amendment has the potential to raise more than $275 million a year, of which roughly one third—about $85 million a year—will go toward protecting and preserving Minnesota's surface and ground water.

In spring 2009, the Minnesota legislature took the first step in investing that money, appropriating $750,000 to the University of Minnesota's Water Resources Center to create a comprehensive, 25-year framework for the sustainable management of Minnesota's water resources. The framework is intended to serve as a roadmap—with clear signposts on how and when to spend the money and on what initiatives—based on scientific research, expert opinion, and input from citizens around the state. The plan, titled "Minnesota Water Sustainability Framework," will be presented for recommendation to the legislature in January of 2011.

In February 2008, Environment Canada launched a $17.7M (over a four-year period) Lake Winnipeg Basin Initiative (LWBI), which includes support for monitoring and research activities in Lake of the Woods. The LWBI was developed partly in response to Manitoba's request for federal support in meeting research, information and monitoring needs, and to facilitate governance and cooperation throughout this vast, trans-boundary watershed. Work is now underway on the three components of the LWBI: $12.1M to conduct a science (research/information/monitoring) program; $3.6M to develop and administer a Lake Winnipeg Basin Stewardship Fund; and $1.9M to facilitate governance. As the LWBI is scheduled to end in 2012, discussions are currently underway to explore potential priorities for a renewed Lake Winnipeg initiative, which once again would include a governance component. For this reason, it will be important for the Task Force to communicate our recommendations for governance in the Lake of the Woods and Rainy River watershed, ideally to have these coincide with proposed governance for the Lake Winnipeg Basin.

3.2 Namakan Basin Sanitary Sewer Project

The Voyageur's National Park Clean Water Joint Powers Board was set up to carry out a preliminary planning project to help project partners develop a comprehensive wastewater collection and treatment system (including centralized and decentralized treatment) for the housing, recreational, and resort developments in the Park's Namakan watershed area. A planning report was prepared and presented at a series of public hearings in June 2010.

3.3 1989 Shoal Lake Tripartite Agreement

This agreement between the Shoal Lake Indian Band No. 40, the Province of Manitoba and the City of Winnipeg was made to facilitate the exercise of regulatory authority by the Band on Reserve lands in a manner consistent with the preservation of the quality of the Winnipeg water supply and consistent with the Band's need for economic growth.

3.4 Preservation of Lands and Resources

As part of the 2007 Provincial Parks and Conservation Reserves Act in Ontario, ecological integrity was given first priority when planning and managing provincial parks and conservation reserves and balancing the varied interests. As part of this Act, the Lands for Life program was born. On Lake of the Woods alone, over 39,000 ha were protected as Conservation Reserves; on Rainy Lake, at least 7,800 ha of islands were also protected from major industrial uses such as mining and forestry.

Management plans for Quetico Provincial Park, Voyageurs National Park, the Boundary Waters Canoe Wilderness Area and the Superior National Forest have common management agreements for resource protection. In an effort to prevent severe burns that would adversely impact water quality and unique resources, Quetico Park and Superior National Forest worked bi-nationally to reduce fire fuel loads after the massive blow down of July 1999.

In response to pressures on the fisheries resource in the watershed, a number of proactive resource management activities have taken place. These include the buy-out of commercial fisheries on border lakes (other than those with tribal rights), reduction of limits on game fish, establishment of slot limits and closure of major known spawning bays in spring to protect fish from overharvesting.

4. *International Cooperation*

There has been an increasing number of examples of international cooperation (some outside of the IJC structure) to solve shared problems in the watershed.

4.1 Lake of the Woods Water Quality Forum

This annual event, now in its eighth consecutive year, is held at the Rainy River Community College in International Falls, Minnesota. It is the premier event for researchers and resource managers to congregate to discuss research plans, hear research progress, and collaborate across the Canada/U.S. border on items such as joint quality assurance / quality control, sharing resources and data, and focusing on common goals. Over the years, topics for discussion have included algae and nutrients, paleolimnology, international cooperation, and hydrological monitoring. Hosted by the LOWWSF, the partner organizers for this forum hail from MPCA, MOE, Environment Canada, St. Cloud State University, and Rainy River Community College.

4.2 Hydropower Peaking Arrangement

Concerns about the impacts of hydropower peaking operations at Fort Frances – International Falls on the Rainy River prompted the IRLBC and IRRWPB to convene an informal work group with representatives from the hydropower companies and resource agencies to develop a means of addressing the concerns. The working group considered hydropower needs and fish spawning. The hydropower companies agreed to voluntarily restrict hydropower peaking operations during key spring spawning times as conditions permit. The working group reviews conditions, including temperature, to inform decisions and reviews the process annually.

The Rainy boards, working closely with dam operators and provincial, state and federal agency representatives, successfully concluded an agreement to limit fluctuations in water flows driven by variations in demand for electricity - "peaking" - from hydropower facilities at Fort Frances-International Falls, in order to minimize adverse environmental impacts. In 2006, the boards convened an informal working group to design and establish an informal process to balance hydropower needs with fish spawning needs during the spring spawning period on a two-year trial basis. The working group agreed on an annual 2-1/2 month spring spawning window during which no hydropower peaking would take place for 2007 and 2008; this voluntary arrangement continues to today. The general start and end dates for this window were April 15th to June 30th, but the dates are revisited annually to reflect the actual timing of the walleye and sturgeon spawning and incubation. The boards have initiated studies, with IWI funding, to more accurately identify the spawning window.

4.3 Multi-Agency Arrangement

Recognizing the need for a collaborative effort on the part of resource agencies in the watershed to research and begin to manage water quality concerns on Lake of the Woods, an International Multi-Agency Arrangement (2009) was established among agencies, a non-governmental organization, and a tribe. The group is entering its second full year of operation and has developed a five-year plan for research and goal-setting related to concerns around erosion and blue-green algae on Lake of the Woods. While informal in structure, this group has developed a quality assurance / quality control program for sample analysis, begun discussion on collaborative data management, partnered on filling data gaps regarding much-needed water quality sampling, and begun paleolimnological and modeling research.

4.4 Bi-national harmonization of Geographic Information System (GIS) data

GIS-based hydrographic datasets developed in the U.S. and Canada commonly terminate at the international border, and are often inconsistent with each other in terms of scale, classification and standards. These inconsistencies make it difficult to model hydrology on a watershed basis in trans-boundary waters, such as Lake of the Woods and the Rainy River. As part of the IJC's International Watershed Initiative, a Transboundary Hydrographic Data Harmonization Task Force is coordinating the harmonization of both hydrographic and drainage area data sets in the Lake of the Woods and Rainy River watershed. It has completed the first phase of this effort, which involved harmonizing Canada's National Hydro Network (NHN) with the U.S. National Hydrographic Dataset (NHD) within 100 m of the border. Next steps are to harmonize GIS datasets on a more detailed, local scale. The Data Harmonization Task Force held an initial meeting with GIS experts from local agencies at the 2010 Lake of the Woods Water Quality Forum.

4.5 Joint Research

Sturgeon research on the Rainy River and Rainy Lake/ Namakan Reservoirs was directed by the bi-national Minnesota and Ontario Fisheries Committee. Results informed the voluntary hydropower peaking arrangement (discussed above) on Rainy River by paper companies to protect fish during spawning, and have increased understanding regarding how sturgeon are using border waters and the Namakan River.

There has also been extensive bi-national sharing of watershed research and monitoring data concerning eagles, colonial water birds, cormorants, loons, beaver, wolves, moose, lynx, fisheries, zooplankton, exotic species, lake bottom sediment, aquatic vegetation, benthic organisms, environmental contaminants, phycology, climate change and paleoecology.

5. *Initiation of Watershed-based Initiatives*

5.1 IJC's International Watersheds Initiative (IWI)

A growing interest in managing water-based issues on a watershed basis has gained momentum within the watershed, from both the IJC perspective and other agencies. The IJC's IWI concept promotes an integrated ecosystem approach to issues that is focused on facilitating local people in their efforts to solve local issues. The initiative facilitates the development of watershed-specific responses to emerging challenges such as population growth and urbanization, climate change, and introductions of exotic species. The IJC's International Watershed Initiative has funded significant hydrological research on the lower and upper Rainy River that will be shared with resource agencies in both countries. Additional projects include temperature and flow gauge installation and management that will inform hydropower peaking discussions and water flow management.

5.2 Local Watershed Planning

The Rainy River Basin Planning Process and Report (2004), conducted by the MPCA under the Clean Water Act, was completed with goals and objectives for water management in the Rainy River Basin. Significant planning and public outreach were done as a part of this project, and research has proceeded in the past few years that emanated from this study. Minnesota takes a watershed approach to monitor and assess water quality throughout the state and is now doing so on a 10-year cycle in order to restore waters that do not meet water quality standards and to protect those that do meet standards.

Watershed planning has also been ongoing at the local level, most significantly in Minnesota. Each county with area within the watershed has developed local water management plans, supported by the efforts of their soil and water conservation districts, which address priority water-related issues across the county and make recommendations for the implementation of protection strategies. Issues of focus include land use management, erosion/sedimentation, sewage treatment, water quality and education.

On the Canadian side of the border in this watershed, there is no current watershed management planning mechanism. However, relevant water-related plans include the Shoal Lake Management Plan, the Seine River Water Management Plan, the Steep Rock Mine Reclamation plan, and Environment Canada's Lake Winnipeg Basin Initiative, which incorporates the Lake of the Woods watershed. ,

6. *Grassroots Interest*

6.1 Local Voices Pushing for Action

Grassroots non-governmental organizations such as the Lake of the Woods Water Sustainability Foundation (LOWWSF), Lake of the Woods District Property Owners' Association, Rainy Lake Conservancy, Quetico Foundation, Heart of the Continent, Rainy River Soil and Crop Improvement Association and others, became involved in lobbying governments and the IJC and its Boards, promoting stewardship education, and attending public meetings concerning watershed issues. For example, since 2004 the LOWWSF has been heightening the awareness of water quality concerns on Lake of the Woods at all levels of government within Canada and the U.S. and garnered written support for their cause from U.S. Counties, local non-governmental organizations, the Premier of Ontario, Manitoba Water Stewardship, and others throughout the watershed. Koochiching, Lake of the Woods and Roseau Counties worked cooperatively with the Lake of the Woods Sustainability Foundation to support bi-national efforts to protect Lake of the Woods water quality.

6.2 *First Nation/Tribal Efforts*

6.2.1 *Red Lake Band of Chippewa Indians*

The Red Lake Band of Chippewa Indians signed the international Multi Agency Arrangement to protect water quality in Lake of the Woods. As a result of that affiliation, the Red Lake Band initiated a water sampling program to fill a gap in data on the west side of Lake of the Woods.

6.2.2 *Rainy River First Nation Watershed Program*

The Rainy River First Nations Watershed program was established in 1998 and aims to increase public awareness to promote involvement in the protection, conservation, and revitalization of the Rainy River watershed; monitor and inventory potential impacts to the Rainy River watershed; and rehabilitate areas of concern. Within a watershed approach to environmental protection, the program achieves its goals by working cooperatively with community members, elders, local businesses, private landowners and municipal, provincial and federal agencies. Activities within the program include educational workshops, river cleanup events, stewardship activities with school age children, science camps, collaboration with Health Canada to conduct bacteriological surveys along the Rainy River (from the dam at Fort Frances/International Falls to its mouth near Rainy River/Baudette, both in Canada and the United States), hosting of Man-O-Min watershed conferences, stream assessments and lake sturgeon research, bald eagle aerial surveys, prairie-oak savannah inventories, developing a fisheries resource stewardship framework, conducting land use/stream assessments and producing a community environmental plan.

Issues in the Watershed

The International Lake of the Woods and Rainy River Watershed Task Force has engaged many people from around the watershed to discover the issues that concern them. Meetings were held with First Nations and tribes, governmental and non-governmental resource agencies, and the public at large. The Task Force went upstream to Ely, Minnesota, downstream of the watershed to Winnipeg, Manitoba, and to points in between. The Task Force compiled all the issues heard into the Issues Table in Appendix E, from the initial round of IJC public meetings in late August and early September 2010, from the CAG and public meetings in October, or from individual meetings with agencies or aboriginal groups. The table lists each issue brought to the attention of the Task Force, characterized in the following categories:

- Watershed development
- Water quality
- Water quantity
- Education and Outreach
- Communication
- Aboriginal affairs
- Governance

This section briefly describes the issues raised in each category, but for the complete list the reader is directed to the Issues Table in Appendix E.

Some readers may feel an issue raised in upland areas of the watershed may not be an issue of bi-national concern, as only the waters of Namakan and Rainy lakes, the Rainy River, and Lake of the Woods are boundary waters. However, an issue which affects the quality or quantity of the surface water runoff or groundwater in the watershed, which eventually flows downstream to significantly affect a boundary water, could potentially be considered an issue of bi-national concern.

4.1 Watershed Development

Inhabitants of the watershed raised concerns about residential and industrial developments impacting water quality and quantity locally and downstream. The cumulative impact of growth was a concern as no overarching mechanism exists to assess the impacts of development on the watershed in its entirety. Land uses generating non-point and point sources of pollution are not currently mapped within the entire watershed. The Task Force heard that the diversion of water from Shoal Lake, a bay of Lake of the Woods, for Winnipeg's drinking water conflicts with development in the watershed. Furthermore, the environmental assessment process for development projects varies on each side of the international border. While a number of parks, protected forests, and wilderness reserves exist in the upper watershed, a 20-mile long break interrupts the wildlife corridors and protected areas along the Namakan River. Issues with watershed development included impacts from residential growth, road, and hydropower development; timber and agriculture industries; and mining and impingement on wetlands. The concerns were raised not only around the Lake of the Woods but also upstream in the headwater portions of the watershed. Each concern is discussed below.

4.1.1 Residential Growth: The particular concern with increased residential growth, and the conversion of cottages to permanent residences, is the capacity of existing sewage treatment facilities to handle increased loadings. Septic fields may then have insufficient capacity; piping to proper facilities and the

upgrading of facilities requires adequate funding. Increased industrial growth would increase populations, increasing the demands on existing sewage treatment facilities. Also included in this issue category would be inadequate set-backs for shoreline erosion protection, water quality and aesthetics, and concerns for adequate drinking water supplies. A large concern was expressed about the lack of development control for the large portion of the watershed in unorganized territory in Ontario.

4.1.2 Road and Hydropower Development: An issue was raised about the twinning of the highway north of Lake of the Woods and possible impacts that could have on water quality. Also raised was that upgrades to the road bridge linking Baudette, Minnesota to Rainy River, Ontario are proposed which may have effects on water quality, flows, and levels during construction. Another issue was the development of hydropower on the Namakan River in particular and elsewhere in general. The sturgeon stock that could have their migration inhibited by the construction of run-of-river hydroelectric power on the Namakan River do not observe international boundaries; tracking studies have shown they swim downstream into Namakan Lake and its tributaries on both sides of the border. The Task Force also heard that studies have shown that hydro-power development increases the loading of methyl-mercury in downstream water bodies.

4.1.3 Timber and Agricultural Industries: These industries, which impact large tracts of land, affect both water quality and water quantity, compared to pre-development conditions. Leaching of soils and agricultural nutrient runoff directly impact water quality downstream. These land uses change the timing and magnitudes of peak runoff for water quantity. The Task Force was told that timber cutting has a significant impact on wildlife corridors and impacts river morphology and sediment loads.

4.1.4 Mining: Mining issues range from the abandoned Steep Rock mine in Ontario to potential mining of sulfite-bearing ores in upstream Minnesota. The Steep Rock mine, developed during the Second World War, is slowly but surely filling to overflowing, when its toxic waters will spill downstream into the Seine River and Namakan Lake. New mining may not only affect surface water quality and quantities, but may also contaminate groundwater, should proper controls be ignored. The increased employment activity with new mining may lead to the growth issues discussed in sub-section 4.1.1.

4.1.5 Impingement of Wetlands: An issue was raised with development draining wetlands and reducing the acreage of this land feature essential to the health of the watershed, both around Lake of the Woods and in the tributary river watersheds and the upstream lakes. Wetlands assist in the purification of water, serve as fish nurseries for many species, and provide habitat for many wildfowl, fur-bearing animals, and other creatures. Of particular concern was the trenching of ditches south of the Rainy River to allow for more land to be tilled in agriculture.

4.2 Water Quality

Inhabitants of the watershed also raised concerns about water quality. Many voiced the issue that poor water quality impacts the economy of the watershed, which is heavily reliant on tourism, fishing, and the outdoor experience. Some requested a timely solution to the recent poor water quality on Lake of the Woods. More specific issues revolved around current water quality problems, regulations for water quality and water quality monitoring. These are discussed below.

4.2.1 Current Water Quality Problems: Water quality issues involve the erosion and sediment problems both along the south shore of Lake of the Woods and also along the Rainy River, nutrient loading problems including toxic blue-green algae on Lake of the Woods, and problems with wildlife, especially

invasive species, as well as fish and exotic parasites. Climate change may be influencing the growth of algae, a major cause for concern on Lake of the Woods. Air-borne pollutants, both long-range and local, contribute to water pollution in the watershed. Issues were raised with water treatment plants, the extent of their service, and inflow and infiltration problems. Nutrient sources, particularly of phosphorus, were major issues.

4.2.2 Water Quality Regulation: Many voiced the concern of insufficient water quality regulations in the watershed, insufficient enforcement of what regulations existed, and a lack of collaboration between regulatory agencies allowing for gaps and inconsistencies between each country and between portions of the watershed. A desire for obligatory water quality objectives for Lake of the Woods approved by the U.S. and Canadian governments was noted, in addition to a request for alert levels similar to those for the Rainy River. Many government agencies raised the need for land use guidelines or regulations that would stipulate best practices that would improve the water quality from non-point sources.

4.2.3 Water Quality Monitoring: The issues raised regarding water quality monitoring ranged from a specific, current issue, that no monitoring of cumulative non-point source pollutants into water bodies is occurring within the watershed, to a more general, long-term issue that coordination and the sufficiency of monitoring is inadequate. The Task Force heard that no responsible body currently exists to whom the water quality monitoring results are reported and that would coordinate monitoring efforts.

4.3 Water Quantity

Inhabitants of the watershed raised concerns about water quantity, such as regulation, monitoring and flooding, all of which are discussed briefly below.

4.3.1 Regulation: The concerns with the regulation of the water levels in Lake of the Woods and Rainy and Namakan lakes are related to sudden water level fluctuations on the lakes as well as in upstream and downstream rivers, the effects of fluctuations on ecology, especially sturgeon spawning and wild rice culture, and the process of regulation. The Task Force heard that people are unable to influence the levels on Lake of the Woods, are unable to handle climate change, particularly the increased variability in weather of the past decade, and are unable to regulate the watershed as a whole. A desire for a more systematic approach using numerical models of the entire watershed, which would contribute to more knowledge and insight into the effects on water levels of regulation, was voiced. The Task Force also heard of concerns with the age and life-cycle management of the structures in the watershed, including when the structures would be removed.

4.3.2 Monitoring: The concerns with water quantity monitoring in the watershed related to the need for more gauges throughout the watershed: streamflow, snowpack, water level, temperature, and precipitation. Funding for gauging is precarious and uncertain in the long-run. Also an issue is the use of multiple vertical datums, which generates confusion (1929, NAVD 88). The datum for the defined lake level operating range is different than that currently used for land surveys. In addition, isostatic rebound is very slowly changing the levels of the lake measured at the south end of the lake, relative to the north end.

4.3.3 Flooding The concerns with flooding relate to a lack of compensation for First Nations, outstanding in Canada for nearly a century to the effects on endangered species such as the nests of the piping plover and on the wild rice crop, and to the lack of hazard land descriptions or zones along the Rainy River and Rainy and Namakan lake shorelines. The delineation of flood hazard zones could prescribe the

construction within lands subject to flooding and reduce damages considerably. The Task Force heard that excessive flows due to destabilized tributary rivers increase erosion of vulnerable shores and create subsequent sedimentation downstream.

4.4 Education and Outreach

Inhabitants of the watershed voiced many concerns calling for a better understanding through education and outreach. The need for the outreach ranged from education on the physical processes to support for socio-economic processes. Support for the social dimension of watershed management is also important, especially for reaching people in smaller isolated communities. People at the IJC's public meetings called for education on the effects of weather on water levels, how property rights are protected under the 1938 Rainy Lake Convention, and how the transition between control of lake levels by the Lake of the Woods Control Board to the International Lake of the Woods Control Board occurs. A member of the CAG brought up the need for more media attention for the Taskforce and by extension, to the existing Boards and their operations. An example would be more media attention on the Lake of the Woods Control Board's education and outreach on development on flood hazard lands. Some government agencies expressed concern about a lack of knowledge of the governmental processes on other side of the border in each country.

4.5 Communication

Official communication, coordination and collaboration were also raised as issues, such as the insufficient communication between the upstream populace/agencies with the downstream populace/agencies/institutions of the International Joint Commission. The Task Force heard of the difficulties that individual agencies had interacting with their counterparts across the border, or even within the same country. The current state of affairs was termed a "tangled web" which made communications difficult from one agency to another.

4.6 Aboriginals and Native Americans

The First Nations, Métis and tribes in the watershed voiced many concerns, starting with the presumption of the Canadian government that it could ask the International Joint Commission to look into water management in the watershed without consulting the First Nations and Métis first. Affected First Nation communities in Canada stated they have yet to be compensated for flooded lands bordering Lake of the Woods. Aboriginal peoples in the watershed have a different tradition for managing the land and water resources; their law emphasizes sharing resources and concerns were raised that others' laws should recognize the traditional aboriginal law. The Kenora Chiefs noted that they want to be at the table as "rights holders" not "stake holders"; these rights include land claims, hunting and fisheries resource allocation. The Shoal Lake Band #39 is considering establishing a Shoal Lake Water Control Board and would like to ensure communication with other Boards in the watershed.

4.7 Governance Mechanisms

Many inhabitants of the watershed expressed issues with the historic and current governance mechanisms, and aspirations for future governance mechanisms, briefly described below.

4.7.1 Historic: Shoal Lake Band #39 expressed concern that although the IJC gave permission for the City of Winnipeg to withdraw water for municipal purposes, it didn't include industrial uses. Band #39

also stated that land has been expropriated for the intake, increasing the inflow of poorer quality water from Lake of the Woods into Shoal Lake. Shoal Lake Band #40 mentioned that there was a watershed agreement, but it was dysfunctional.

4.7.2 Current: The concerns with current governance mechanisms ranged from the "patchwork" of authorities of the existing Boards and arrangements, both geographically and with respect to mandates, to an exclusion of First Nation communities, to difficulties in information and communication exchange between federal, state and provincial agencies. A number of agencies mentioned that Homeland Security and Canadian Customs officials make frequent impromptu trans-border travel difficult. A lack of leadership and funding commitments was noted, as was a lack of a priority list with concomitant funding and resources. Another issue was the differing goals and socio-economic-political values between the two countries. Also, noting the different legal systems in the two countries, several individuals voiced uncertainty and difficulty navigating the regulatory process on the other side of the border. A regulatory gap exists in Canada for the vast extent of unorganized lands. Finally, a concern was raised about the availability of the International Joint Commission's International Watershed Initiative program to help build local capacity.

4.7.3 Future Aspirations: The concerns expressed for the future include identifying priorities, resource capacity, and local participation. First Nations wish to be at the table on equal footing with the Canadian and American nations. A notion to enhance the connection between existing boards rather than creating a new mega-board was expressed within the CAG and the Rainy Boards. The Task Force heard the warning that any new mechanisms be fully committed with resources and funding to accomplish the assigned tasks. Finally, a need for an overarching mechanism that provides international coordination where necessary, but not to replace more local efforts, was expressed within the CAG.

As this brief discussion shows, the people in the watershed have many and varied issues with water management. The Task Force continues to compile others and will note those most frequently expressed and those of high priority for the final report. The reader is again encouraged to review the Issues Table in Appendix E for a complete list of the issues heard to date.

Observations

Having examined activities and governance mechanisms that impact water management, and based on feedback that we have received to date, the Task Force has some initial observations to share in terms of what currently appears to be working, where there may be room for improvement, and what may be missing. In the next section, we have proposed some options for structures and activities that may be appropriate to address these observations. Over the course of the next few months, the Task Force will have further discussions with bi-national entities, First Nations, Métis, Tribes, government agencies, communities, our CAG, and interested public to ground-truth these observations and to secure additional feedback re the strengths and weaknesses of existing governance mechanisms, as well as our proposed range of options. We also plan to prioritize and map issues against existing organizations and governance mechanisms to ensure that there is an entity in place to address them.

In an effort to examine and share information regarding how issues are currently being addressed in the watershed at various scales, the Task Force undertook to create some charts showing the cross-linkages among stakeholders at different scales (NGO/Community, Local Governments, State/Provincial, National, International) with existing governance structures for:

1. Water level regulation on Lake of the Woods,
2. Water quality in the Lake of the Woods / Rainy River watershed, and
3. Environmental assessment on both sides of the border.

These charts served not only as educational tools for identifying roles, existing collaboration, and existing and potential opportunities for input but were also useful at highlighting some possible deficiencies. A brief description of each chart, along with some of our observations, is provided below. The Task Force is currently developing charts for environmental assessment on both sides of the border as a further means of mapping connections, and will make those charts available in the future.

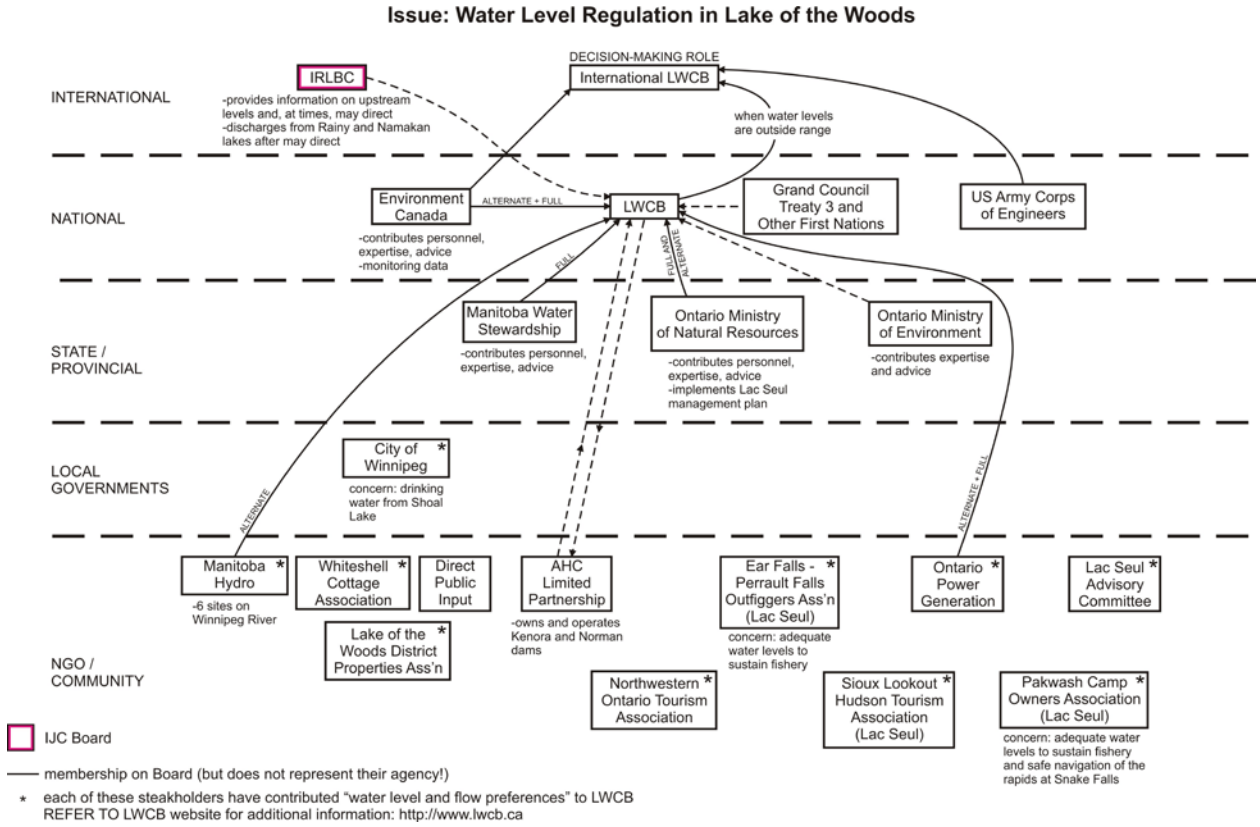

Figure 4: Water Level Regulation on Lake of the Woods

As shown in Figure 4, the Lake of the Woods Control Board, which is a Canadian Government entity, has full discretionary power at regulating water levels in Lake of the Woods within the range of levels contained in the Lake of the Woods Convention for the benefit of a wide range of both American and Canadian interests. There is no mechanism in place to review the decisions of this Board. It has members at the National and Provincial scales. Numerous stakeholders at the NGO/Community scale, as well as one Local Government (City of Winnipeg), identify formal "*Water Level and Flow Preferences*" to the LWCB for their consideration in regulating water levels. The Task Force observed that there is an absence of "*Water Level and Flow Preferences*" submissions from US stakeholders even though the Control Board has asked for input in the past. In discussions with the Task Force, a few U.S. Government agencies have articulated interest in specifying their preferences for water levels to the Control Board, however, other US agencies were unaware of opportunities for making their preferences known to the LWCB.

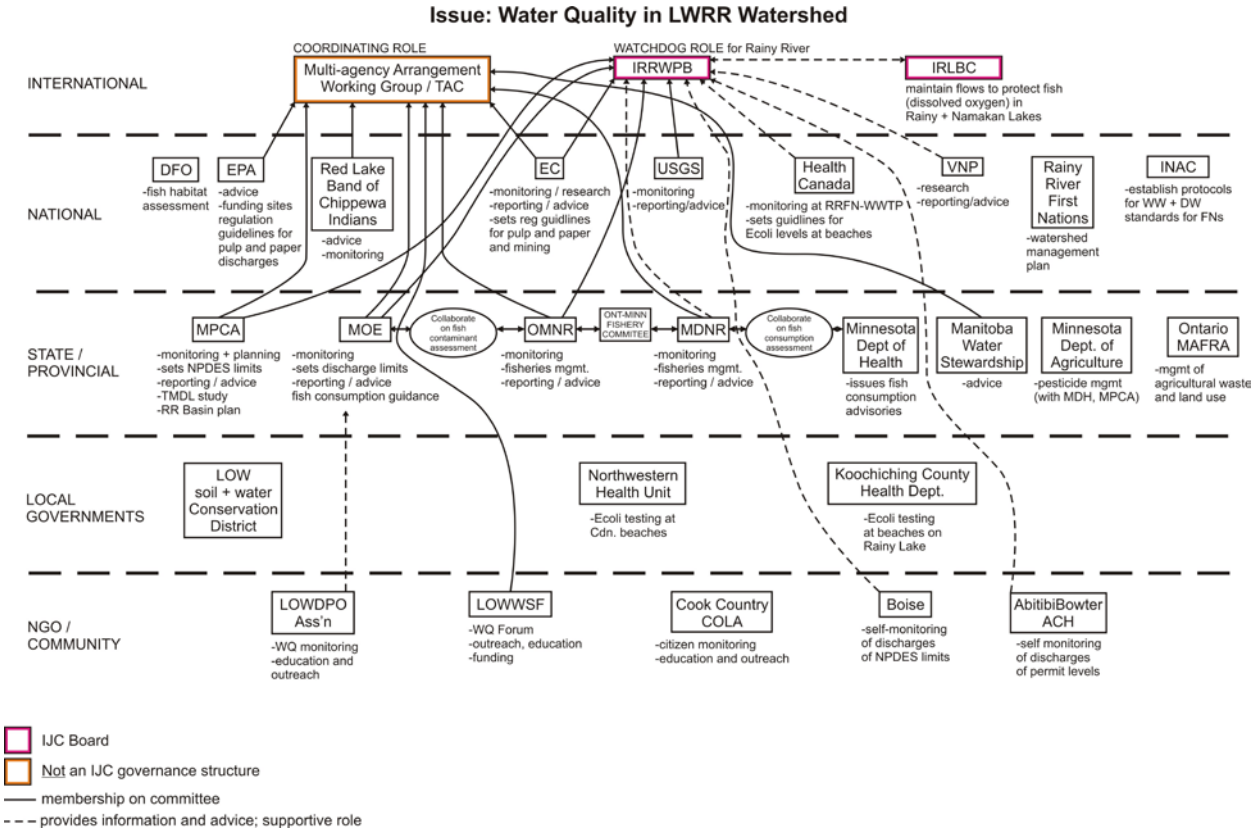

Figure 5: Water Quality in Lake of the Woods and Rainy River Watershed

Figure 5 illustrates the many organizations, at all levels of scale, which are monitoring water quality in the watershed. The IRRWPB draws on information from many (but not all) of these organizations in order to report to the IJC. There is also evidence of some collaboration among multiple agencies (such as the IMA-WG) as well as interagency (such as between MOE and OMNR for providing fish consumption guidance); however, there is no one entity that has the role of overall coordination and reporting, particularly for the water quality of Lake of the Woods. We also note that, while there are good working relations among individual federal, state and provincial agency officials, there is no higher level arrangement between Minnesota and Ontario that establishes cross border communication and collaboration as a shared priority of the governments.

The Task Force also gleaned considerable information through our civic engagement (that is, discussions with aboriginal groups, CAG members, public and various government agencies operating in the watershed). For example, we observed that stakeholders were not always aware of issues being faced elsewhere in the watershed, nor what impact activities in their portion of the watershed might have on downstream interests. Additionally, we noted that there are several significant county water management plans, watershed plans, and individual river plans in existence. For example, in 2004 the MPCA completed the Rainy River Basin Plan under the authority of the U.S. Clean Water Act, which covers most of the U.S. portion of the Lake of the Woods and Rainy River Watershed. There is no comparable management plan in the Canadian portion of the watershed and no management plan for the entire watershed. Finally, at the working level, there seemed to be good communication and collaboration across the border; however, there appeared to be a lack of understanding as to how to communicate issues and become engaged in processes at the decision-making level (e.g., approvals for

the proposed hydroelectric development project at Namakan). There is also uncertainty whether and, if so, how issues of bi-national concern are addressed in decision-making processes in the other country.

In our examination of governance mechanisms in the watershed, the Task Force observed that current arrangements are fragmented and overly complicated; at the same time, there is not presently an international governance mechanism in place to manage water quality in Lake of the Woods (the IMA-WG simply coordinates science and shares information). We observed a shortage of public involvement in overseeing water management in the watershed, as well as Tribal/First Nation/Métis representation on governance entities. That being said, we recognize the difficulties: for example, selecting a single participant that could represent the many (>20) First Nation communities in the watershed.

Although perhaps outside the scope of governance, per se, we learned that there is a great deal of good work underway to identify and understand issues in the watershed, but we observed in some cases that the science has not yet identified the source/cause of the problem in order to proceed with remedial measures (e.g., source of nutrient loading to Lake of the Woods; cause of nuisance/harmful algal blooms). We noted a lack of water quality monitoring in extensive areas of the watershed which would make it difficult, if not impossible, to assess the cumulative impact of all of the contributions to the watershed. We have further observed that, when solutions are found that call for implementation of remedial measures, most importantly, there may not be the commitment or resources to carry them out.

Possible Governance Options

This chapter, included at this early stage in part because of requests from the Citizens Advisory Group for examples that could spark more informed discussion, provides initial consideration of some possible governance options. It illustrates the general range of options related to bi-national governance structures and activities to be addressed, and provides four illustrative examples. The range of options and the illustrative examples presented are based on the input and feedback received to date, while acknowledging that further engagement and discussion is required, and are primarily intended to stimulate discussion. The draft final report, which the Task Force expect to issue in May, will address in further detail governance options for the bi-national management of water quality and water quantity issues in the Lake of the Woods and Rainy River watershed.

Range of Options related to "bi-national governance structures"

The range of options concerning bi-national governance structures span from the status quo (that is, do nothing), to creating an international watershed board; and everything in between.

Under the status quo option, the Lake of the Woods Control Board and the International Lake of the Woods Control Board would continue to operate as they now do. The International Rainy Lake Board of Control and International Rainy River Water Pollution Board would continue as separate IJC Boards, with separate mandates, but would work closely together as they have in recent years. In addition to their specific responsibilities, as set forth in relevant IJC Orders and directives, the Boards would continue to report key watershed developments of potential bi-national concern in the Rainy River Watershed to the International Joint Commission. Additionally, the Multi-Agency Arrangement would continue as a co-operative arrangement by the signatories, coordinating science activities and sharing data/information. The Minnesota-Ontario Fishery Committee would also continue.

At the other end of the spectrum, an International Watershed Board could be created for the entire international Lake of the Woods and Rainy River watershed; the Board could be an agent of the Governments or the International Joint Commission. The mandate, membership and responsibilities of such a Board would need to be defined. The Board could be a separate organization that would coordinate with other existing organizations, or it could subsume one or more of those organizations.

Many options fall within these two ends of the spectrum that might be recommended to enhance the current bi-national institutional arrangements, or create new governance structures. These include:

- The International Rainy Lake Board of Control and the International Rainy River Pollution Board could be merged and their mandate expanded to include additional duties, as well as an expanded geographic scope;
- The Multi-Agency Arrangement could be expanded to coordinate science activities throughout the Lake of the Woods and Rainy River watershed, and assume additional water management duties; one possibility is that this could be similar to the Lake Superior Lakewide Management Plan Working Group;
- The two Rainy Boards could continue in their present form and a new IJC Board established to deal with water quality issues in Lake of the Woods.

Range of Options related to "Activities"

A range of options for specific activities could lead to enhanced water management in the watershed; some of these are outlined below:

The Lake of the Woods Control Board and the International Lake of the Woods Control Board could be requested by governments to increase transparency and provide increased, convenient opportunities for affected interests in both the U.S. and Canada (including Aboriginals and Native Americans) to participate in discussions regarding the management of Lake of the Woods levels.

The Multi-Agency Arrangement could be formalized, such as by an agreement between the U.S. and Canada. The nature of its development and implementation would need to be determined and could vary depending on the specific benefits desired, available resources, breadth of partners and activities, etc.

There could be a recommendation that Minnesota and Ontario (and perhaps Manitoba) take steps, through a memorandum of understanding or otherwise, to coordinate and focus their efforts to restore and enhance the ecological health of the Lake of the Woods-Rainy River watershed. This would facilitate cross border communication and would provide more robust support to current and future bi-national activities in the watershed.

There could be a recommendation to develop a watershed plan (see Box) to provide vision, context and guidance for future development and activities in the watershed. Terms of reference for this activity, as well as a list of participants, would need to be developed. The nature of such a plan could vary depending on whether it was binding or aspirational, high-level or more operational, etc.
There could be a recommendation to establish a Water Resources Centre or Water Science Centre of Excellence, within the watershed, to ensure collaboration and data sharing continue, to act as a resource for both the scientific community and the public and to provide a venue for all information pertaining to the watershed and its resources.

There could be a recommendation for new bi-national studies, such as:

- A water quality study on Lake of the Woods
- A study of Lake of the Woods water level regulation and its effects
- The possibility of more systemic regulation of water levels throughout the watershed

Studies could be conducted under a reference to the IJC under Article IX of the Boundary Waters Treaty or by a bilateral study group, at the discretion of the two federal governments. Resources permitting, studies could focus federal attention on watershed issues and needs; study outcomes could answer long-standing questions, provide scientific grounding for better defining the means of addressing various issues, raise governance implications, etc.

Watershed Planning

Making decisions such as land use activity, water quality protection or water level regulation are best made within the context of "watershed planning", which employs an ecosystem approach to understanding environmental interrelationships and to managing change within the watershed itself. This requires a perspective that boundaries are not tied to political jurisdictions, but rather to the natural, biophysical boundaries within which the interaction of human activity and the natural environment can be considered.

A "watershed management plan" recommends how water resources are to be protected and improved as land uses change within the watershed. It is based on field research that includes information on the form and function of natural systems within the watershed; it investigates and explains the relationships between the organisms, including humans, that use and impact the water. The plan should be developed cooperatively by government agencies, First Nations, Métis and Tribes and the stakeholders who manage the water for the benefit of the land/water interactions, aquatic life and aquatic resources with the watershed. The plan is proactive in that it provides a framework for dealing with issues early on before they become more costly to correct; it brings together all interests in the basin to understand how they influence one another and the information in the plan can provide valuable background for policies and provisions included in planning documents. When ecosystem considerations are integrated into the planning process, it is more likely that land use decisions will not jeopardize ecosystem and human health (Federation of Ontario Cottagers' Associations, 2009).

Illustrative Examples

Listed below are three examples in further detail for illustrative purposes.

Example 1: Enhanced Bi-national Institutional Arrangements

The Lake of the Woods Control Board and the International Lake of the Woods Control Board would continue to operate under the 1925 Convention at this time. The boards would be requested by governments to increase transparency and provide increased, convenient opportunities for affected interests in both the U.S. and Canada (including Aboriginals and Native Americans) to participate in discussions regarding the management of Lake of the Woods levels.

The International Rainy Lake Board of Control and the International Rainy River Water Pollution Board would be merged and would become the International Lake of the Woods and Rainy River Watershed Board. This new board would:

- Continue to manage Rainy and Namakan Lake outflows, perhaps with a committee to act in emergency situations;
- Extend the current alerting role regarding matters of bi-national concern to the entire Lake of the Woods-Rainy River watershed and develop a watch list of issues that might become matters of bi-national concern in the future;
- Monitor and report on progress toward achieving water quality objectives approved by the governments and on water quality parameters that are of concern in the watershed.
- Continue to convene meetings of resource agencies in the watershed;
- Facilitate cross-border participation by government officials and others in licensing and other activities which have potentially significant trans-boundary effects; and
- Increase the number of public meetings held each year in the watershed to provide greater opportunities for members of the public to participate in discussions and become better informed about watershed issues.

The Multi-Agency Arrangement would by formalized by an agreement between the U.S. and Canada. Its mandate could be expanded to include the entire watershed. Among other things, it could be responsible for:

- Undertaking water quality studies for Lake of the Woods or other portions of the watershed, at the request of the governments;
- Implementing the results of those studies, or of studies carried out by the IJC, at the request of the governments; and
- Facilitating cross-border participation by government officials and others in licensing and other activities which have potentially significant trans-boundary effects.

The Minnesota-Ontario Fishery Commission would continue but would look for new opportunities to work collaboratively with other bi-national boards and groups in the watershed. For example, it could work with the new International Lake of the Woods and Rainy River Watershed Board as part of the working group and could contribute to the related sturgeon spawning studies.

Mechanisms to involve Aboriginal and First Nations in cross-border governance structures would be considered.

Issues such as water quality in Lake of the Woods and the development of a nutrient management strategy and plan and a review of the regulation of Lake of the Woods levels and outflows could be referred to the International Joint Commission for investigation and report.

Example 2: MAA is the watershed initiative board

Under this option, the Lake of the Woods Control Board and the International Lake of the Woods Control Board would continue to operate under the 1925 Convention at this time. The boards would be requested by governments to increase transparency and provide increased, convenient opportunities for affected interests in both the U.S. and Canada (including First Nations and Tribes) to participate in discussions regarding the management of Lake of the Woods levels.

The International Rainy Lake Board of Control and the International Rainy River Water Pollution Board would be merged and would become the International Rainy Board. This new board would:

- Continue to manage Rainy and Namakan Lake outflows in accordance with IJC Orders;
- Continue to monitor and report on water quality in the Rainy River;
- Continue to convene meetings of resource agencies in the watershed; and
- Provide an alerting function for issues that may affect bi-national water management in the Rainy River watershed.

The Minnesota-Ontario Fisheries Management Committee would continue but would collaborate with the new International Rainy Board on issues of mutual interest. Mechanisms to involve Aboriginal and First Nations would be considered.

The Lake of the Woods Multi-Agency Arrangement would provide focus for addressing Lake of the Woods watershed water management issues with bi-national implications. It would:

- Continue to foster trans-jurisdictional coordination on science and management activities;
- Continue to undertake, through its participating members, new research projects;

- Continue to share new information broadly;
- Expand its focus from water quality to ecological health in Lake of the Woods;
- Coordinate with the Lake of the Woods Control Board, the International Lake of the Woods Control Board, the International Rainy Board, and the Minnesota-Ontario Fisheries Management Committee
- Seek to establish common objectives for water quality (ecological health?) in the Lake of the Woods watershed and provide a venue for determining what actions and schedule each partner will undertake to achieve those objectives;
- Provide a vehicle for bi-national coordination and discussion about issues affecting water management, including discussion and attempted resolution of issues of potential bi-national concern in the watershed; and
- Serve as an international watershed board:
    - Approach 1: Providing reports to the International Joint Commission, not as a IJC-constituted or IJC-appointed board, but through an agreement for appropriate alerting and reporting; the relationship would allow for:
        - Regular consideration of actions taken and progress achieved in meeting water quality objectives and achieving long-term ecological health;
        - Elevation of critical issues to the IJC when needed (and, through it, to the two federal governments when appropriate); and
        - Provision of funds by the IJC to carry out work consistent with its International Watershed Initiative.
    - Approach 2: Providing reports directly to governments through agency representatives participating in the Arrangement.

The nine entities currently party to the Arrangement would consider whether the proposed changes would benefit from more formal institutionalizing or adjusted membership.

Example 3: Establish a Lake of the Woods Water Quality Board

The governments would refer water quality impairment issues, i.e. excess nutrients and nuisance algal blooms in Lake of the Woods, to the International Joint Commission for investigation and report.

Article IV of the Boundary Waters Treaty of 1909 states that boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of the health and property on the other side. If the waters of Lake of the Woods are seen to be polluted or otherwise impaired, the governments of Canada and the United States may refer this matter to the IJC, under Article IX of the Boundary Waters Treaty.

Thus, a study would be commissioned to inquire into and report on the sources of water quality impairment on Lake of the Woods focusing on nuisance algal blooms and excess nutrient loads, particularly phosphorus. The study could address the following:

- Whether the waters of Lake of the Woods are being polluted on either side of the boundary to the injury of health or property on the other side of the boundary.
- If this is found to be the case, to what extent, by what causes and at what localities is the pollution taking place.
- Recommend measures to remedy the impairment to water quality and reduce the sources of water pollution.

- This could include determining water quality objectives for waters of Lake of the Woods which would be protective of health and property on either side of the boundary.
- This could include coordinating existing water shed plans, such as the Total Maximum Daily Load study being developed by the Minnesota Pollution Control Agency, and equivalents on the Canadian side, to meet water quality objectives in collaboration with responsible jurisdictions in the watershed.

The IJC would report to the governments based on the results of the abovementioned study. As a result of this report, the governments may recommend that a new water quality board be created for Lake of the Woods. This would be an IJC Board.

Under this option, the Lake of the Woods Control Board and the International Lake of the Woods Control Board would continue to operate as per the 1925 Convention at this time. The International Rainy River Water Pollution Board and the International Rainy Lake Board of Control would continue to operate as at present.

The Multi-Agency Working Arrangement would eventually be replaced by the new water quality board for Lake of the Woods.

The Minnesota- Ontario Fisheries Management Committee would continue. Mechanisms to involve Aboriginal and First Nations in cross-border governance structures would be considered.

The function of the Lake of the Woods Water Quality Board would be similar to the current functions of the International Rainy River Water Pollution Board, including:

- Reporting on water quality objectives and progress on achieving those objectives;
- Identifying and reporting on emerging issues or threats to water quality in Lake of the Woods to the IJC; and
- Working closely with the Lake of the Woods Control Board as well as IJC Boards and responsible resource agencies.

Appendix A: Letters of Government to the IJC

United States Department of State

Washington, D.C. 20520

June 17, 2010

Charles A. Lawson, PhD
U.S. Section
International Joint Commission
2000 L St., NW, Suite 615
Washington, DC 20036

Dear Dr. Lawson:

The International Joint Commission (IJC) has a long and successful history of engagement in the Lake of the Woods and Rainy River system. Concern over fluctuating water levels on Lake of the Woods led governments to refer the matter to the IJC in 1912, resulting in the Lake of the Woods Convention and Protocol in 1925 and the establishment of the International Lake of the Woods Control Board. The IJC has been regulating water levels in the Rainy and Namakan lakes since 1938 and overseeing the water quality of the Rainy River since 1965.

In order to ensure the long-term ecological and economic vitality of Lake of the Woods and the Rainy River Basin, the governments of Canada and the United States are fostering trans-jurisdictional coordination and collaboration on science and management activities to enhance and restore water quality in the basin. A review of the bi-national management of the basin would complement these activities and will contribute to any future approach to addressing new and emerging water quality issues and water management needs.

In accordance with Article IX of the Boundary Waters Treaty and further to the reference letters from governments on November 19, 1998, concerning the International Watersheds Initiative, the governments of Canada and the United States request that the IJC examine, and make recommendations regarding, the bi-national management of the international waters of the Lake of the Woods and Rainy River system and the IJC's potential role in this management.

These recommendations should address potential structures and mechanisms for governance, as well as priority issues or activities to be addressed by or through such mechanisms.

The examination and recommendations should be in line with the IJC's International Watersheds Initiative, the aim of which is to facilitate watershed-level solutions to transboundary environmental challenges by promoting communication, collaboration and coordination among the various stakeholders and interests using an integrated, ecosystem approach. The recommendations must, of course, respect existing treaties, orders and jurisdictional authorities already in place in this region.

The Commission is requested to produce a final report of its work in response to this reference within eighteen months from the date of this reference. The governments request the Commission to pursue its activities and examinations expeditiously, and to make periodic reports to the governments, as appropriate. Reporting should include IJC plans for engaging with the federal governments and relevant provinces, First Nations, tribes and states, as well as the wider body of stakeholders and the public.

The governments further request that the Commission undertakes this work as part of the International Watersheds Initiative with respect to funding any activities required, drawing upon the resources provided by the governments to the Commission for this program annually.

Based on the recommendations of the Commission and after consideration of input provided by the relevant provinces, tribes, and state, the governments may consider a follow-up reference to expand IJC's role in addressing water quality issues in Lake of the Woods.

A similar letter is being sent to the Secretary of the Canadian Section of the Commission by the Department of Foreign Affairs and International Trade.

Sincerely,

Velia M. De Pirro
Director, Office of Canadian Affairs

Foreign Affairs and International Trade Canada
Affaires étrangères et Commerce international Canada

Ottawa, Canada
K1A 0G2

Mr. Murray Clamen, Secretary
International Joint Commission
Canadian Section
234 Laurier Avenue West, 22nd Floor
Ottawa, ON K1P 6K6

JUN 17 2010

Dear Mr. Clamen:

The International Joint Commission (IJC) has a long and successful history of engagement in the Lake of the Woods and Rainy River system. Concern over fluctuating water levels on Lake of the Woods led governments to refer the matter to the IJC in 1912, resulting in the Lake of the Woods Convention and Protocol in 1925 and the establishment of the International Lake of the Woods Control Board. The IJC has been regulating water levels in the Rainy and Namakan lakes since 1938 and overseeing the water quality of the Rainy River since 1965.

In order to ensure the long-term ecological and economic vitality of Lake of the Woods and the Rainy River Basin, the governments of Canada and the United States are fostering trans-jurisdictional coordination and collaboration on science and management activities to enhance and restore water quality in the basin. A review of the bi-national management of the basin would complement these activities and will contribute to any future approach to addressing new and emerging water quality issues and water management needs.

In accordance with Article IX of the Boundary Waters Treaty and further to the reference letters from governments on November 19, 1998, concerning the International Watersheds Initiative, the governments of Canada and the United States request that the IJC examine, and make recommendations regarding, the bi-national management of the international waters of the Lake of the Woods and Rainy River system and the IJC's potential role in this management.

These recommendations should address potential structures and mechanisms for governance, as well as priority issues or activities to be addressed by or through such mechanisms.

The examination and recommendations should be in line with the IJC's International Watersheds Initiative, the aim of which is to facilitate watershed-level solutions to transboundary environmental challenges by promoting communication, collaboration and coordination among the various stakeholders and interests using an integrated, ecosystem approach. The recommendations must, of course, respect existing treaties, orders and jurisdictional authorities already in place in this region.

..2

Canada

The Commission is requested to produce a final report of its work in response to this reference within eighteen months from the date of this reference. The governments request the Commission to pursue its activities and examinations expeditiously, and to make periodic reports to the governments, as appropriate. Reporting should include IJC plans for engaging with the federal governments and relevant provinces, First Nations, tribes and states, as well as the wider body of stakeholders and the public.

The governments further request that the Commission undertakes this work as part of the International Watersheds Initiative with respect to funding any activities required, drawing upon the resources provided by the governments to the Commission for this program annually.

Based on the recommendations of the Commission and after consideration of input provided by the relevant provinces, tribes, and state, the governments may consider a follow-up reference to expand IJC's role in addressing water quality issues in Lake of the Woods.

A similar letter is being sent to the Secretary of the United States Section of the Commission by the United States Department of State.

Sincerely,

Michael Rooney, Director
United States Transboundary Affairs Division

Appendix B: Directive to the International Lake of the Woods and Rainy River Watershed Task Force

DIRECTIVE

TO THE
INTERNATIONAL LAKE OF THE WOODS AND RAINY RIVER WATERSHED TASK FORCE

The purpose of this directive is to establish and direct the International Lake of the Woods and Rainy River Watershed Task Force to examine and report to the International Joint Commission on matters expressed by the governments of Canada and the United States in letters to the International Joint Commission dated June 17, 2010 (copies attached). As stated in these letters, the Governments requested that the IJC review and make recommendations regarding the bi-national management of the Lake of the Woods and Rainy River Basin and the IJC's potential role in this management. This is the mandate of the International Lake of the Woods and Rainy River Watershed Task Force.

The Commission will appoint Members of the Task Force, Co-Chairs to lead the Task Force's efforts, and Co-Secretaries. The Co-Chairs will be responsible for organizing and executing the work of the Task Force, and for coordinating with, and reporting to, the Commission. The Task Force will be binational, comprising an equal number of members from each country. Under the general supervision of the Co-Chair(s), the Secretaries shall carry out such duties as are assigned by the Co-Chairs or the Task Team as a whole. Members and Secretaries of the Task Force will act in their personal and professional capacities and not as representatives of their countries, agencies, organizations, or other affiliations. The Commission will provide guidance to the Task Force and will pursue technical assistance from the two Governments, as identified by the Task Force. Members of the Task Force and any committees or work groups created by it will be responsible for their own expenses unless otherwise arranged with the Commission.

In addressing the matters raised by the Governments in their June 17 letters, the Task Force will coordinate its investigations and engage federal governments and relevant provinces, First Nations, tribes and states, as well as the wider body of stakeholders and the public. The Commission stresses the importance of public outreach and consultation. The Task Force shall coordinate all such activities with the Commission. The Task Force shall consult with the International Rainy Lake Board of Control and International Rainy River Pollution Board to seek their views so that each Board and Task Force may be aware of any activities of the other that might be useful to it in carrying out its responsibilities.

The Task Force shall keep the Commission fully informed of its progress and direction through regular communications with, and by reporting to, the Commission Secretaries or their designees.

The Task Force will evaluate and analyze available information, and it will inform the Commission of any additional informational requirements necessary to address the matters raised by the Governments. The Task Force will strive to reach decisions by consensus and will immediately notify the Commission of any irreconcilable differences. Any lack of clarity or precision in instructions or directions received from the Commission shall be promptly referred to the Commission for clarification.

The Commission authorizes the Task Force to begin its work immediately. The Task Force will submit a work plan with an associated schedule of activities and budget for the Commission's approval as soon as practicable. The work plan shall include a proposal that will describe how public consultation will be undertaken. The consultation plan shall discuss how the Task Force will collaborate with federal governments, provinces, First Nations, tribes and states, as well as the wider body of stakeholders and the public. The Task Force will submit its final report no later than July 15, 2011. The final report should contain the Task Force's findings, conclusions and recommendations regarding the matters raised by the governments.

Documents, letters, memoranda, and communications of every kind in the official records of the Commission are privileged and become available for public information only after their release by the Commission. The Commission considers all documents in the official records of Task Force or any of its committees or work groups to be similarly privileged. Accordingly, all such documents shall be so identified and maintained as separate files.

Signed this 13th day of July, 2010.

Charles A. Lawson
Secretary
United States Section

Murray Clamen
Secretary
Canadian Section

Appendix C: Task Force Outreach

The Task Force has been assisted greatly in its work by those who have provided information and views. This appendix documents outreach by the Task Force as of February 18, 2011. Further outreach continues and will be documented in subsequent reports.

The Task Force contacted the following local governments to ask for their views and to determine how each might prefer to communicate with the Task Force. The Task Force also contacted the Rainy River District Municipal Association.

Communities / Municipalities:
Alberton
Atikokan
Babbitt
Baudette
Beatty
Breitung
Chapple
Cook
Dawson
Eagles Nest
Ely
Embarrass
Emo
Field
Fort Frances
Grattan
Greenwood
Hibbing
International Falls
Kenora
Kinghurst
Lake of the Woods
LaVallee
Leiding
Linden Grove
Morcom
Morley
Orr
Pike
Portage
Rainy River
Sandy
Sioux Narrows / Nestor Falls
Tower
Vermillion Lake
Waasa

Warroad
Winnipeg
Winton
Wuori

Counties:
Cook County
Koochiching County
Lake County
Lake of the Woods County
Roseau County
St. Louis County

The Task Force contacted the following agencies. Unless otherwise indicated, the Task Force met with agency representatives either in person or by telephone. (Inquiries to the U.S. Farm Service Agency, U.S. Army Corps of Engineers, and U.S. Federal Emergency Management Agency have not yet resulted in a meeting or call.)

State/Provincial:
Manitoba Water Stewardship
Minnesota Department of Natural Resources
Minnesota Department of Transportation
Minnesota Pollution Control Agency
Ontario Ministry of Aboriginal Affairs
Ontario Ministry of Environment
Ontario Ministry of Municipal Affairs and Housing*
Ontario Ministry of Natural Resources
Ontario Ministry of Northern Development, Mines and Forestry
Ontario Parks

Federal:
Agriculture and Agri-Food Canada
Environment Canada
Fisheries and Oceans Canada
Health Canada*
Indian and Northern Affairs Canada
U.S. Bureau of Indian Affairs
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey
U.S. National Park Service
U.S. National Resources Conservation Service
U.S. National Weather Service

*Contact not resulting in meeting in person or by telephone

The Task Force issued a letter to each Tribe to ask to ask for their views and to inquire how each might prefer to communicate with the Task Force. The Task Force has also been in contact with Grand Council Treaty 3, Fort Frances Chiefs Secretariat, Anishinaabeg of Kabapikotawangag Resource Council (AKRC), Network for Native Futures, the Kenora Chiefs Advisory, and Métis Nation of Ontario.

Anishinaabeg of Naongashiing (Big Island) First Nation
Bimose Tribal Council
Bois Fort Tribe
Buffalo Point First Nation
Couchiching First Nation
Iskatewizaagegan (Shoal Lake) #39 Independent First Nation
Lac Des Milles Lacs First Nation
Lac La Croix First Nation
Mishosiimiiniizibing (Big Grassy) First Nation
Mitaanjigaming (Stanjikoming) First Nation
Naicatchewenin First Nation
Naotkamegwanning (Whitefish) First Nation
Nigigoonsiminikaaning First Nation
Northwest Angle #33 First Nation
Northwest Angle #37 First Nation
Obashkaandagaang First Nation
Ochiichagwe'Babigo'Ining (Dalles) First Nation
Ojibways of Onigaming First Nation
Rainy River First Nation
Red Lake Band of Chippewa Indians
Seine River First Nation
Shoal Lake #40 First Nation
Wabaseemoong (White Dog) First Nation
Wabigoon Lake Ojibway Nation
Washagamis Bay (Obashkaandagaang)First Nation
Wauzhusk Onigum First Nation

The Task Force met with the following organizations either in person or by telephone.

Lake of the Woods Control Board
International Joint Commission
International Rainy Lake Board of Control
International Rainy River Water Pollution Board
Lake of the Woods Multi-Agency Arrangement Work Group
Ontario-Minnesota Fisheries Committee

Appendix D: International Lake of the Woods and Rainy River Watershed Task Force's Citizen Advisory Group

NAME	ORGANIZATION
Les Ainspac	Shoal Lake 39
Bob Anderson	Boise Paper
Paul Anderson	Rainy Lake Conservancy
Carla Arneson	Citizen, Researcher
Barry Baltessen	Lake of the Woods District Property Owners' Association
Rick Battles	Warroad Watershed
Cecil Burns	Citizen
Jerry Caple	Cook County Coalition of Lake Associations (Gunflint Lake rep.)
John Carlson	Border Lakes Association
Rick Carson	Citizen
Cameron Clark (or Arthur Saunders)	The Quetico Foundation
Barbara Clark	Cook County Coalition of Lakes Associations
Len Compton	Citizen
Iain Davidson-Hunt	Citizen
Graham Gork	Citizen
Craig Halla	Forest Capital Partners
Eric Hansen	Ontario Power Generation
Kiley Hanson	Citizen
Mike Hirst	Lake of the Woods Soil and Water Conservation District
E. James Hook	Citizen
Bruce Johnson	Citizen
Larry Lamb	Ontario Soil and Crop Improvement Association
Kurt Lysne	Voyageur National Park
Jay Mackie	JR Mackie & Associates
Tim "Chopper" McBride	City of International Falls
Jack McKenzie	Citizen
Susan McLeod	Lake of the Woods District Property Owners' Association
Craig Pagel	Iron Mining Association of Minnesota
Joan Richardson	Citizen
Rob Scott	Crane Lake, Voyageurs National Park Clean Water Joint Powers Board
Todd Sellers	Lake of the Woods Water Sustainability Foundation
Tim Shanks	City of Winnipeg
Colleen Sklar	It's Lake Friendly!
Roger Skraba	City of Ely
Claudia Westlund	Northwestern Health Unit
Jason Westmacott	Manitoba Hydro
Dyke Williamson	Heart of the Continent Partnership, citizen
Tom Worth	Rainy Lake Sportfishing Club
James Yount	Citizen

Appendix E: Issues Table

Character	Description
1. Watershed Development	• Cumulative effects of increased development in the watershed on LOW water quality and drinking water sources upstream • Comprehensive land use and pollutant point source mapping for entire watershed • Stormwater management • Subdivision of large tracts into much smaller land holdings increases the difficulty of conducting sound land management practices to prevent septic failures and shoreline erosion • Uncontrolled land use in areas outside of natural parks, municipal and county regulated areas, etc. No control over anglers, recreational visitors, etc. • Land use changes (especially forest to cropland) • Resource development impacts (hydropower, mining, forestry, agriculture) • Unregulated industrial growth contaminating water • Development of private lands around LOW with very shallow soils • Increased surface water temperatures from vegetation removal, expanded impervious surfaces and exposed compacted areas from urban development, hydrology changes that destroy or re-route natural flow via culverts, etc. • Undesirable erosion and water contamination from uncontrolled shoreline property development without sufficient vegetated buffer riparian zones • Sediment loading (both point and non-point) from development along lakes and streams, road construction, forestry operations, and agricultural activities • Enforcement of existing land use laws and use of BMP in development and forest management activities • Groundwater issues • Effects of mining on aquifers and sulfide mines near Ely on surface and ground waters • Impacts of proposed gold mining in Pinewood River basin and Harmion Lake on water quality and quantity and other mines on US side • Steep Rock abandoned mine and possible effects • Cumulative impacts of hydropower development • Effect of possible Seine River hydropower development • Possible effects of Namakan River hydropower project on bi-national water management (water quality, water levels, fisheries) • Private power companies control water releases on eastern power plants • Shoal Lake FN are asking for a commitment (see submission); concern re supply of freshwater for municipalities and potential need to draw from northern lakes

	• Rebuilding Baudette/Rainy River road bridge • Water management and erosion control at road, bridge and construction sites • Bypass surveys - Effect of moving Hwy 17N closer to LOW (effect on LOW water quality) • Watershed protection for sources of drinking water conflicting with development desires • The reduction, through development and lack of management, of marshes and fens and other wetlands which serve to conserve and cleanse water • Timber harvest – Cutting has a significant impact on wildlife corridors, impacts water quality and morphology – for example, Little Fork has not yet stabilized; direct inflow to Rainy River with big sediment load • 20 mile gap along Namakan River between National Forest with wilderness canoe area and VNP • Proximity of agricultural uses to the lake • Contamination and nutrients from feedlot runoff
2. Water Quality	
2.1 Current Problems	• Timeliness of solutions to water quality issues • Algal blooms and underlying water quality are significant concerns. Higher nutrient loading may be associated with this accelerated erosion. (need to quantify in terms of volume and importance.) • At low flows, water quality in the Winnipeg River related to DO deficiency, a legacy oxygen demand from bottom sediments from Kenora's pulp and paper industry as well as dilution of municipal waste effluent • Economic impacts of poor water quality • Impacts of cyanobacterial toxins or e.coli concentrations on water quality and its use for food production or cattle watering • Impact of Climate Change - increased local climate variability • Climate change – trying to coordinate the best way to respond to climate change with partners , the Landscape Conservation Cooperatives have been a good mechanism for this
2.1.1 Physical	• Acidification • Air quality - deposition of contaminants • Local air pollution affecting water quality • Erosion at southern end of LOW, relationship to water management practices, if any • Link between erosion and water quality, if any • Impacts of tile drainage on soil erosion • Rainy River streambank erosion • Increased shoreline erosion on the southern shore of Lake of the Woods - including Pine Island, Garden Island, Curry Island and Buffalo Point. • Large boats causing erosion, other problems with wakes • Velocity of Warroad River flows affecting bank erosion, water quality

	and fisheries management • Entire shoreline of Shoal Lake is eroding – movement of water east and west due to conflicting uses • 2002 major flood event eroded ditches, drainages, and shoreline depositing sediment in watercourses, impeding both drainage and waterway navigation. Continual dredging for access to channels leading to LOW. • Increasing frequency of larger water level fluctuations on Rainy Lake which in turn increase lakeshore erosion. • Excess sedimentation in Bostic Bay, Zippel Bay and Little Fork River and in the Rainy River leading to boating issues. • Opening up of Ash Rapids to allow logging from Shoal Lake into Kenora – pollution entering Shoal from LOW as a result • Hydro facilities at east end of Shoal Lake being used as a holding space – shoreline eroded • Hydro-wires in water • Water purification plants now required for drinking water • Impacts from mining effluent (sulphides, mercury and phosphorus) • Sulfate levels affecting wild rice roots • Chemical spills upstream of water intake line • Toxic Chemicals – mercury, PCBs, landfills, hazardous waste generators • Mercury levels throughout the watershed • Elevated mercury levels in Kabetogama system • Mercury sources, including natural sources, aerial transport, legacy lake sediments from historic pulp and paper processing and mobilization by fire • Impacts of fluctuating water levels on mercury and methyl-mercury in water • Potential increase in methyl mercury with Namakan power project • Pesticides • Threat to d/s water quality when Steep Rock Mine near Atikokan overflows • Climate change
2.1.2 Biological	• Economic impact of algae in the water to property owners • Increasing frequency, duration, and extent of algal blooms on LOW, particularly blue-green algae • White mat/foam on shorelines • Impacts to wild rice such as algal blooms • Microbial induced corrosion • Nutrient loadings to LOW • Eutrofication and the movement of nutrients in LOW, Kabetogama and Namakan Lakes and how nutrients influence the population dynamics of phytoplankton.. • Finding an appropriate mixing model for Lake of the Woods, a southern basin that is well mixed and appropriate for a bathtub model

	vs northern basins with complex water flow and thermal stratification • Impact of total phosphorus levels and how much from visitors and how much from residents • Historic buildup of phosphorus in the system's sediments and its current impact • Nutrient contributions into the Rainy River on the north side, some from agricultural sources, and how to be pro-active in addressing them; Consider paying farmers to avoid commercial fertilizer • A clear determination of a nutrient budget for the lake is needed, as well as actions that could be taken for the long-term health of the lake. • Nowhere to empty holding tanks on south end of LOW • Pollution resulting from inadequate wastewater management, including failing septic systems, inflow and infiltration problems, storm overflows, industrial effluent, and recreational wastes • E.coli contamination • Pollution to surface and ground water from contaminated runoff • Legacy pollutants • Endocrine disruption (part of sewage discussion; USGS leading research all over, including effects on ecology, people's drinking water) • Emerging contaminants in Kabetogama and Namakan Lakes – USGS has been monitoring distribution of endocrine disrupting compounds in water and sediments
2.1.3 Fauna	• Invasive species and diseases (ash borer, VHS, zebra mussels, spiny water flea, rusty crayfish, purple loostrife, European buckthorn, spotted knapweed, cattails etc.) • Quality of the fisheries in light of phosphorous loadings • Tourism down due to overfishing • Animals have declined or are sick • Endangered Species- US FWS- provide section 7 (Endangered Species Act) consultations for other federal agencies in regards to activities which could impact on endangered species- this process is very effective • Identification and characterization of spawning sites for the protection of Bi-national populations of Lake Sturgeons • Parasites in fish found in 1990s never seen before • Mapping of Critical spawning areas in Rainy River • Impacts of water fluctuations on loons, beavers and suckers • Contaminants in water harmful to fish in Winnipeg River • Kenora and Norman dams grinding fish • Exploitation of fisheries resource and equitable sharing
2.2 Regulation	• District Land Use Guidelines from 1980's are ineffective • Review of Seine River Water Management Plan (expires 2014) • Disconnect between permit writers in the basin and the lack of collaboration, leading to no connection between permit levels

	allowed for various facilities and total loadings in the basin • Process for regulatory agencies to change limits (e.g. for mining) and then to enforce them? • prevention of agricultural wastes, chemical runoff and leaching from entering watershed • Lack of US EPA regulatory authority over non-point sources of pollution • Water quality impacts of agriculture and other land uses require best practices or regulations to control runoff contaminants • Each country has different water quality regulations • Regulatory control of sewer lines and mains • Only single dwellings have setback requirements
2.3 Water Quality Monitoring	• Sufficiency and extent of long-term monitoring to be broader than water quality on LOW, should include cumulative non-point source pollutants • Coordination and report of LOW water quality monitoring • Ongoing monitoring is difficult – measuring effectiveness of efforts/remediation is required, but often missing • Insufficient monitoring in Winnipeg River • Data gaps
3. Water Quantity	
3.1 Regulation	• Climate change, including anticipated increased difficulty controlling water levels given increased variability • Fluctuations in annual precipitation make it difficult to control lake and river levels but for the most part the 2000 Rule Curve has helped alleviate some of the problems • Modelling of hydrology, water levels and flows between the lakes and rivers of the entire watershed to allow for systematic management of the dams • Lack of hydrologic data for modelling in basin • Need for better understanding of factors affecting water levels • State and future of over 100 yr old dams bordering VNP • High water levels on Lake of the Woods – 2.5 to 3 feet higher than pre-settlement level • Recent management of the dams at Kenora may be a major contributing factor to increased shoreline erosion and loss of endangered species habitat on Lake of the Woods. • Lake sturgeon under the Ontario Endangered Species Act and under the Canadian Species at Risk legislation (SARA) may have a future impact on regulation of Lake of the Woods and Lac Seul. • Effect on Shoal Lake water quality of (a) reversing flow so LOW would flow into Shoal Lake, and (b) raising water level of LOW in 1914 and beyond • LOW outflows higher than 575 cms result in loss of power generation • Impact of LOW water management on English River watershed • MDNR unaware of means to influence LOW water levels

	• Remoteness of LWCB operation (perception of not being able to manage from 1500 miles away, lack of trust) • Unexpected water level changes • Ecosystems responding to unnatural water levels, stressing biological components and the reduction of spawning habitat, especially that of sturgeon. • Peaking during fish spawning periods
3.2 Monitoring	• Improved monitoring with more gauging stations throughout the watershed to allow better modeling and forecasting based on a watershed approach under one lead bi-national board • Limited snow monitoring as perhaps the biggest gap in their water availability predictions, although melt time and spring rains also have significant impacts • Adequacy of flow and temperature gauges in basin (need mechanism for permanency of gauge at Wheeler's Point) • Gauging on LOW is all on the north end (only 1 near Warroad, no gage near SW corner of LOW) • Need more monitoring for upper Rainy River • Uncertainty over long-term funding for stream gauging networks for the creation of a consistent, long term data set, which is necessary in order to elucidate temporal trends. • Homeland Security border crossing limitations makes servicing streamgauges in international waters difficult • Use of multiple vertical datum generates confusion (1929, NAVD 88), differing land and lake datums • Isostatic rebound is very slowly changing lake levels at the south end of the lake, relative to the north end.
3.3 Flooding	• EC has identified water availability, flooding and drought, as one of the two top priorities in water management across Canada • Impacts of Norman Dam • Flood control • Excess flows due to destabilizing regime • Loss of wild rice, loss of spawn, loss of economic infrastructure without compensation since 1912 • Flooding of Garden Islands - Garden Islands used to produce food for consumption and sale to Hudson Bay – flooding occurred and islands can no longer produce • Nature or lack of consultation with natives, consideration of native rights in 1914 with respect to effects of changes water management of LOW on Shoal Lake • Higher LOW water levels created islands out of peninsulas affecting land claims • Illegal flooding of reserve lands – CA compensated Red Lake tribe, but our tribe was not compensated (Debra Wetzel) • Storing water without providing compensation for inundated property on Rainy and Namakan lakes • Endangered species (e.g., piping plovers); strategies to address in the

	future • Lack of hazard land descriptions proscribing development in floodplains for Rainy River, Rainy and Namakan Lakes based on water levels - valuable information for the public and shoreline property owners
4. Education/Outreach	• Natural resources and water resources education on cause and effects of human actions to maintaining or improving the quality of water and water related environments. • Education re effects of weather on water levels • Flooding impacts on erosion • Understanding how property rights were protected in the 1938 Rainy Lake Convention • Impacts of water levels on wild rice crops (non-dependable supply in Ontario vs Saskatchewan) • Transition from Canadian LWCB to Int'l Board (awareness of reporting chains at higher levels of government, whether Int'l Board has any latitude for decision-making) • Effects of 12-15 foot rise and fall of Rainy River • LWCB impacts on Winnipeg River • Extent of watershed: Net Lake is included in watershed (Bois Forte) • Providing support to help the Lac La Croix be successful in moving forward and to help other smaller communities work together along the border. The social dimension (such as economic depression) is important. • Need to make friends with what media you have in the area, have them attend your meetings • Hydropower concerned with water quantity issues, reduced flexibility in operating procedures. Water quality connections on Lake Winnipeg; where this process would impact operations.
5. Communication	• Continuing communication among agencies delivering on water quality objectives • Overarching priority and getting involvement of state and tribes • MDOT collaborating well with ON MOT for bridge permit process on both sides of border • Linkages between IJC Boards in watershed and other IJC Boards (SAB, IAQAB) • IMA-WG call leads change every quarter, annual leadership would provide more continuity • Better communication u/s of d/s IJC role • Work with agencies across border on projects that have potential impacts on the other country – suggest Section 7 as a potential model for this sort of mechanism • Enhance communications and promote improved coordination with dam operators, IJC, and FERC by attending meetings. • Need channel through which to raise issues on Namakan Dam (better communication horizontally and vertically) – e.g. Park mgmt can only talk to ON through State Dept.

	• Need to recommend approved channels to allow federal agencies in Canada to talk to Minnesota; federal government in U.S. to talk to state government • Tangled web of flow of official communication • No purposeful interaction with other agencies/mechanisms other than the great networking provided by Water Quality Forum • Coordination of agencies is needed, definition of roles, who talks to whom • Better communication of Agricultural Best Management Practices between lower levels of USDA and AAFC, not only at higher levels • Communication protocols between Boards, federal and provincial governments require modifications to become effective
6. First Nations/Tribes	• Level of involvement of First Nation communities on boards, task forces, etc. • FN want seat on IJC – re-open Boundary Waters Treaty • Kenora Chiefs need to be at decision table as rights holders not stakeholders • Current bi-national mechanisms are often ineffective or lacking in addressing aboriginal community engagement (First Nations and Métis) including duty to consult, and government to government relationship established in Ontario. • Kenora Chiefs Advisory have a concern regarding providing input into our process when there are outstanding flooding claims negotiations – they don't want to do/say something that will impact the outcome • Shoal Lake Tripartite Agreement: City of Winnipeg, Province of Manitoba, Shoal Lake Band 40 entered tripartite agreement to manage watershed development so as not to affect water quality • FN law predates "white" laws; FN law emphasizes sharing resources, can't make decisions on water without considering reality of traditional law • Need to recognize the roles and responsibilities of First Nations and Tribes with respect to the watershed, respect those roles and responsibilities, recognize that the thinking is different. • Shoal Lake considering setting up a regulatory authority, as this is an inherent right (Section 35); would like a causeway for access to Shoal Lake 39 traditional lands in the bay • Thinking of establishing Shoal Lake Water Control Board – signing a protocol to ensure communication with other Boards in the watershed • Land claims and assertion of aboriginal (First Nation and Métis) rights for resource harvesting. Future issues with fisheries resource allocation for both commercial and recreational purposes in the watershed. • Should require compensation when water quality deteriorates
7. Governance Mechanisms	
7.1 Historical	• IJC gave approval for Winnipeg to take water for drinking, not industrial use; federal government expropriated land at the intake,

	which they say increases inflow of water in from LOW • Shoal Lake 40 Chief – there was a watershed agreement, but it never panned out
7.2 Current	• Level of involvement of First Nation communities on boards, task forces, etc. • "Patchwork" of authorities of IJC and control Boards (geographically and with respect to mandates) sometimes at odds • Availability of the IJC's IWI program to help build local capacity • Dams for wild rice cultivation prohibited, however power dams are allowed • Lack of bi-national management tools in the form of planning tools, wetland conservation etc. hampers efforts in this area of Lake of the Woods • Competing interests impacted by water management decisions, without any clear mechanism for quantifying all the impacts related to water management decisions (i.e., economic, social, and environmental) • Property owners in the unorganized area asking City of Kenora for information on building permit requirements etc., and to be responsible for all issues associated with protection of waters, wetlands, etc. • Environmental Assessment process differences across border • Ontario policy which allows a construction project affecting a species, i.e., lake sturgeon in one area, to be offset in another area. However, offsetting elsewhere doesn't replace species affected in boundary waters • Role of ON gov't and native issues for Namakan dam • Identification of lack of resources as an impediment to progress • Watershed is missing priority list with funding and resource commitments • Lack of leadership and funding commitments • More resources and funding to the LWCB to assist in the watershed management. a better quantitative understanding of the social, environmental, and economic impacts of LOTW operating strategies • Differing goals and socio-economic-political values between the two countries • Role of Homeland Security out of Grand Forks ND, how they work with Canada; they are exempt from all laws along the border • Border crossing delays and hassles makes servicing stream gauges in international waters very difficult
7.3 Future	• "B-national" not good enough – include 3rd nation • Although FN feel they are at mercy of power companies, industries come and go, and FN are here to stay. • Greater support by both federal governments (Canada and US) to both the LWCB and to the ILWCB for quicker Board appointments. • Timing of IJC bi-national study to meet MN required TDML schedule • A conservation authority would be helpful for flooding issues

	• Answer to governance has to be locally controlled • How to preserve independence of IJC Boards if partnering with local groups • Winnipeg should be under IJC jurisdiction • International Court of the Hague or similar structure • Have Local Units of Government directly represented in the mechanisms and part of the decision making process • Additionally, some sort of planning controls in the unorganized areas which are also not under ministerial order. • Need an overarching mechanism that provides bi-national coordination where necessary (not to replace more local efforts.) Work is best done by those who live there • Sufficient priorities, commitments and resources to deliver on watershed management goals and plan • Increased resource requirements (people and $) of managing on a watershed basis (if "patchwork" were to be expanded) • Additional funding resources to conduct technical studies are also needed. • Can we enhance the connection between existing boards rather than create a new mega-board

Appendix F: List of Acronyms

AAFC	Agriculture and Agri-Foods Canada
AKRC	Anishinaabeg of Kabapikotawangag Resource Council
BIA	U.S. Bureau of Indian Affairs, Department of the Interior
BMP	Best Management Practices
BOD	biological oxygen demand
BWCAW	Boundary Waters Canoe Area Wilderness
CAG	Citizens Advisory Group
CRR	Central Rainy River
DFAIT	Department of Foreign Affairs and International Trade Canada
DFO	Department of Fisheries and Oceans
DNR	Department of Natural Resources
DOS	U.S. Department of State
EC	Environment Canada
EPA	U.S. Environmental Protection Agency
FEMA	U.S. Federal Emergency Management Agency, Department of Homeland Security
FERC	Federal Energy Regulatory Commission
FISWRG	Federal Interagency Stream Restoration Working Group
FN	First Nations
FS	U.S. Forest Service, Department of Agriculture
FSA	U.S. Farm Service Agency, Department of Agriculture
FWS	U.S. Fish and Wildlife Service, Department of the Interior
GIS	Geographic Information System
GPO	U.S. Government Printing Office
HC	Health Canada
IAQAB	International Air Quality Advisory Board
IJC	International Joint Commission
ILWCB	International Lake of the Woods Control Board
IMA-WG	International Multi-Agency Working Group
INAC	Indian and Northern Affairs Canada
IRLBC	International Rainy Lake Board of Control
IRRB	International Red River Board
IRRWPB	International Rainy River Water Pollution Board
IWI	International Watersheds Initiative
KCA	Kenora Chiefs Advisory Council Ogimaawabiitong
LaMP	Lakewide Management Plan
LMFP	Laurentian Mixed Forest Province
LOW	Lake of the Woods
LOWWSF	Lake of the Woods Water Sustainability Foundation
LRR	Lower Rainy River
LSBP	Lake Superior Binational Program
LSW	Lake Superior Watershed
LWBI	Lake Winnipeg Basin Initiative
LWCB	Lake of the Woods Control Board
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health

MDNR	Minnesota Department of Natural Resources
MMAH	Ontario Ministry of Municipal Affairs and Housing
MN	Minnesota
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MOE	Ontario Ministry of the Environment
MPCA	Minnesota Pollution Control Agency
MTO	Ontario Ministry of Transportation
NAVD	North American Vertical Datum
NGO	Non-Government Organization
NHD	National Hydro Dataset
NHN	National Hydro Network
NHU	Northwestern Health Unit
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. National Park Service, Department of the Interior
NRC	Natural Resources Canada
NRCC	Niagara River Coordination Committee
NRCS	Natural Resources Conservation Service, Department of Agriculture
NRS	Niagara River Secretariat
NRTC	Niagara River Toxics Committee
NRTMP	Niagara River Toxics Management Plan
NWS	U.S. National Weather Service, National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
OMNR	Ontario Ministry of the Environment
OMOE	Ontario Ministry of the Environment
ON	Ontario
PPS	Provincial Policy Statement
RMC	River Monitoring Committee
RR	Rainy River
SAB	Science Advisory Board
SARA	Species at Risk Act
SWCD	Soil and Water Conservation District
SWG	Superior Working Group
TAC	Technical Advisory Committee
URR	Upper Rainy River
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey, Department of the Interior
VHS	Viral Hemorrhagic Septicemia
VNP	Voyageurs National Park