MOBILIZING ACTION FOR IMPACT
IN THE LAKE WINNIPEG BASIN
A REPORT

LAKE FRIENDLY STEWARDS ALLIANCE
STEERING COMMITTEE

September 2016

FOREWORD

Lake Winnipeg, an iconic waterbody at the centre of Canada, known for its sandy beaches, hydro-power development, and recreational and commercial fisheries is the world's 10th largest freshwater lake. Lake Winnipeg's basin is massive, home to over seven million people, over 100 indigenous nations and spans parts of two countries, four provinces and four states.

Manitobans know that Lake Winnipeg is under real threat and are passionate about a better future for it. While excess nutrients have been the rallying cry for action in recent years, there is a growing appreciation of the inter- related issues of changing weather, the introduction of aquatic invasive species and fisheries management challenges.

To say Lake Winnipeg is ecologically and jurisdictionally complex is an understatement. Altering Lake Winnipeg's path forward is a classic "wicked problem". Wicked problems are problems for which time is running out. They are complex, hard to define in part because they are constantly changing, hard to solve because the solutions don't come from a single obvious source and often must also involve those far away from the impacts.

I was appointed to the Lake Friendly Stewards Alliance Steering Committee a year ago and am grateful for the privilege of working with a dedicated group of Lake Winnipeg champions. The Lake Friendly Alliance Steering Committee was one of many initiatives undertaken in the last two decades to improve the health of Lake Winnipeg and other lakes in the province. Last December in the Steering Committee's Priorities for Action document I noted there had been a lot of coordinating activity in the province but little impact. My own view is that with this latest report the Lake Friendly Alliance Steering Committee has now done all it can and it is time for a new approach.

The solutions to the challenges that Lake Winnipeg and other lakes in its basin are facing require more than a grassroots all hands on deck, big tent approach. The ecological and jurisdictional complexity of the Lake Winnipeg basin requires leadership from those with legislative authority and resources. To put more bluntly, what we need now is an organizing agent with some clout that can harness the goodwill and mobilize momentum of multiple well intentioned entities.

I think the conditions are right for this to happen. We have a new Canadian government that has committed to protect the Lake Winnipeg basin and allocated significant funds to freshwater research, water and wastewater treatment, environmental sustainability of agriculture and trans-boundary water management. The federal government has also committed to work nation to nation with First Nations. We also have a new provincial government that has committed to secure certification of Lake Winnipeg's fishery and to implement watershed-based planning, and best practice in agriculture.

To borrow a phrase from my colleague Bob Sandford "it is time to connect the engine to the drive shaft". We will not have impact without doing so.

Dr. Annette Trimbee

President, University of Winnipeg

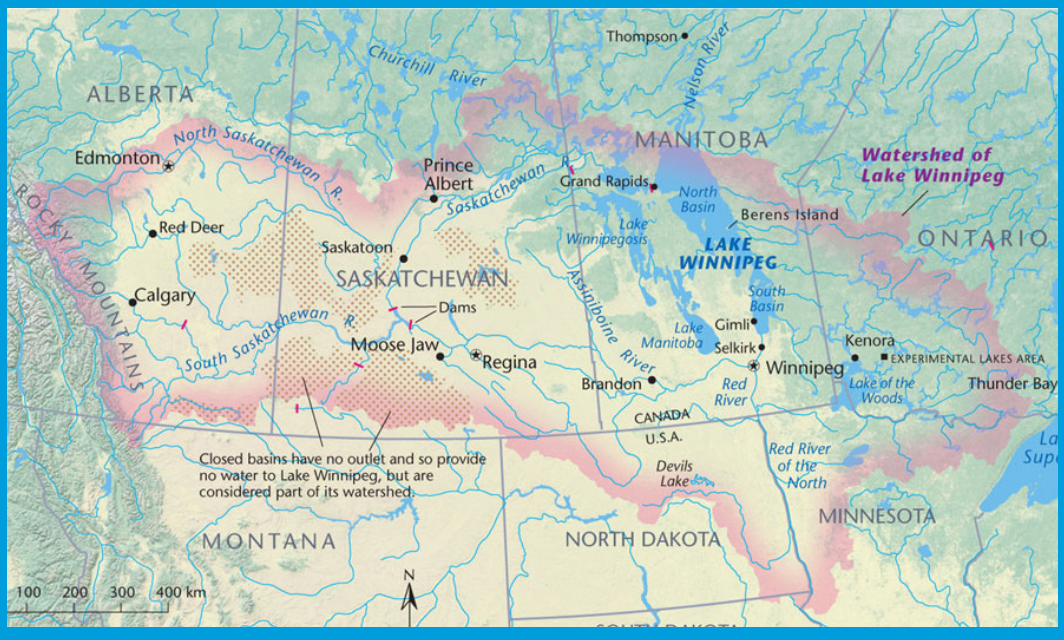

Figure 1: The Lake Winnipeg Basin. Source: Canadian Geographic

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LAKE FRIENDLY STEWARDS ALLIANCE STEERING COMMITTEE

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BACKGROUND

The Lake Friendly Stewards Alliance Steering Committee

The Lake Friendly Stewards Alliance Steering Committee (LFSASC) was tasked in 2013 by the Province of Manitoba and the South Basin Mayors and Reeves to find a collaborative approach and identify clear priorities to address excess inflows of nutrients into the province's watercourses. The committee fully recognizes the problem of deteriorating water quality is far more complicated than nutrient migration alone, with multiple factors such as changes in the hydrologic cycle, increased flooding and the introduction of aquatic invasive species entering the mix and therefore action must be viewed in a broader context.

The challenges we face are not only an environmental issue, what is happening now to Manitoba's lakes and watercourses will have an effect on the province's economy and on our way of life. Lake Winnipeg, Lake Manitoba and many other lakes and watercourses in Manitoba, Canada and around the world are facing similar challenges and if we get this right we may offer an integrated and coordinated path forward for others to follow. No one sector, organization or government can solve this problem alone. Efforts across sectors and across the basin must be planned, coordinated, undertaken and reported on for meaningful and impactful change to take place.

International examples have demonstrated that there are preconditions or best practice for managing, and then getting ahead of the kinds of problems Manitoba faces. While some of these preconditions exist in Manitoba already, the *Priority for Action* document and the *Mobilizing Action for Impact Report* sets a path necessary to foster and support the jurisdictional, corporate and civic capacity required to address these problems in an action framework coordinated across local, provincial and national interests, priorities and scope.

The *Priorities for Action Document* and *Mobilizing Action for Impact Report* offers a path forward to address our challenges while strengthening the social, economic and political stability upon which the current and future prosperity of Manitoba depends.

We have an opportunity in Manitoba and we can succeed with on-going non-partisan political leadership and support at all levels of government including Indigenous, in addition to fully committed aligned support from NGOs, universities, research institutes, foundations, funders, service clubs and public institutions toward our shared vision and action plan.

Over the past two years the Lake Friendly Stewards Alliance Steering Committee has undertaken a review of the actions taking place across the watershed, and has identified priorities for action that fall into seven focus areas and include:

1. Develop a long-term science plan
2. Create a supportive regulatory environment
3. Facilitate nutrient management actions
4. Improve municipal water management
5. Incorporate Indigenous perspectives and knowledge
6. Create a consistent & coordinated messaging strategy
7. Engage & seek transboundary stakeholder commitments

The *Mobilizing Action for Impact Report* constitutes a path forward that can prioritize action across the seven focus areas to direct collective efforts and ensure current budgets are utilized for maximum impact while new monies and efforts are triaged and directed by elected leaders toward provincial and local identified priority areas.

The *Mobilizing Action for Impact Report* offers a clear, strategic approach that can be initiated and led by federal and provincial governments towards meaningful, coordinated and supported action across all political jurisdictions, sectors, civil society, knowledge institutions and the public.

THE LAKE WINNIPEG BASIN – IN REVIEW

At the centre of Canada, Lake Winnipeg is the world's 10th largest freshwater lake, an iconic water body with a basin that includes two countries, four provinces, four states and over 100 Indigenous nations (Figure 1). Lake Manitoba and other regionally significant lakes and rivers such as Lake Diefenbaker, Lake of the Woods, the International Red River, and Assiniboine River are also within this vast basin, which shapes our cultures, drives our prairie economy, is home to over seven million people and is recognized nationally and internationally for its ecological value.

Lake Winnipeg and its basin provide a range of economically valuable ecosystem services that depend on the healthy functioning of the watershed. These include multi-million dollar recreational and commercial fisheries, hydro-power development, agriculture, habitat for wildlife, recreational, cultural, climate control, and regulation services. Yet human activities across this vast area continue to degrade water quality and compromise these ecosystem services. While eutrophication has been the galvanizing concern in recent years, the inter-related issues of hydro-climatic change, aquatic invasive species and fisheries management are inextricably linked.

Existing water quality challenges associated with excess nutrients are exacerbated by changing hydrological regimes and a warming climate. In recent years, the region has experienced more frequent flooding–including the floods of 2011, 2013 and 2014–that have significantly reduced agricultural productivity and damaged expensive municipal infrastructure. At the same time, scientists have linked increased rainfall, runoff and flooding with increased nutrient loading to waterways and increases in the magnitude and frequency of resulting algal blooms. The important role of climate as a driver of nutrient supply in wet years, coupled with the uncertainty of the prairie water regime points to the need for urgent action toward more integrated management of land and water resources within the basin.

Recognition of the risks associated with declining water quality in many of the rivers and lakes within the Lake Winnipeg Basin has prompted action by communities and governments across the Prairies including the Lake Winnipeg Stewards Alliance tasked by the Province of Manitoba and the South Basin Mayors and Reeves in 2013 with identifying and coordinating action in the Lake Winnipeg Watershed. While these initiatives are slowly gaining momentum, significant challenges remain.

Progress toward a healthy Lake Winnipeg and basin has been impeded by the absence of a coordinated and integrated effort throughout the basin. Currently there is a complex mix of local, provincial, state, federal and Indigenous governments, as well as other entities such as watershed groups, resource management groups,and academics who are playing roles of varying significance in understanding, managing and taking steps toward better stewardship within the basin.

While a variety of goals and objectives exist within each respective agency, what is missing is a broader coordination and integration with defined political leadership toward agreed upon objectives. The Lake Friendly Stewards Alliance Steering Committee has identified that what is needed is increased coordination of overarching management goals and objectives to address the complex and interlinked nature of the issues at hand including transparent decision-making processes based on a cyclical evaluation of relevant indicators, which in turn, are based on the best available whole ecosystem science. In the absence of effective coordination, efforts are dispersed, duplicated and often the media is the primary source of information to the general public and stakeholders. At times the communication of trends and progress is sensationalized and ultimately compromised.

Coordination, planning, action and public reporting on collective actions and outcomes is required to ensure measurable positive impacts for the long-term health of prairie waterways, including Lake Winnipeg. The Lake Friendly Stewards Alliance Steering Committee believes that building on, and synergizing the existing positive momentum and further mobilizing the efforts of diverse groups currently engaged in Lake Winnipeg science, management, education, stewardship, and other activities provides a clear opportunity for leadership across all areas of government.

Image above: Algal blooms on the shores of Lake Winnipeg
Source: Lake Winnipeg Foundation

LAKE WINNIPEG INITIATIVES

Lake Winnipeg Basin Initiatives: Past & Present

Initiative	Contributions and Activities
1998 **Lake Winnipeg Research Consortium (LWRC)**	Formed by scientists concerned about the state of the lake following the 1997 flood of the century, LWRC provides on-lake research infrastructure and hosts annual Science Workshops to convene relevant science agencies and address specific issues of concern. Emerging from these workshops, LWRC has produced a coordinated, **whole-ecosystem science plan** for Lake Winnipeg.
2003 **Lake Winnipeg Stewardship Board**	Created through the Government of Manitoba's Lake Winnipeg Action Plan, the Lake Winnipeg Stewardship Board produced 135 **recommendations to reduce nutrients** in Lake Winnipeg to pre-1970 levels.
2004 **Federal-Provincial Science Workshop**	Environment Canada, Fisheries and Oceans Canada and the Province of Manitoba collaborated to develop **recommendations to improve scientific support for the management of Lake Winnipeg**, intended as a first step in the development of an ongoing, whole-ecosystem science program for Lake Winnipeg.
2005 **Lake Winnipeg Implementation Committee**	Formed through a partnership between the federal and provincial governments, the Lake Winnipeg Implementation Committee recommended the **establishment of a Healthy Lake Winnipeg Charter Council to improve coordination and oversight**, strengthen collaboration, and ensure meaningful stakeholder engagement.
2005 **Lake Winnipeg Foundation (LWF)**	Founded by volunteers on the shores of Lake Winnipeg, LWF advances solutions for a healthy lake and watershed guided by the expertise of a **Science Advisory Council**. LWF's outreach program works in schools, communities and Indigenous Nations to **engage and mobilize citizens**. As a membership-based freshwater organization, LWF links science and action to address the root causes of algae blooms.
2005 **International Institute for Sustainable Development (IISD)** **Water Innovation Centre**	Convening water management and policy experts from across the prairies, IISD launched its Water Innovation Centre to **link international best practice and regional water policy development**. IISD conducts policy research, supports a bioeconomy approach to watershed management, and convenes experts and stakeholders to focus attention on emerging regional, national and international water issues and innovative solutions.
2008 **The Lake Friendly Initiative**	In response to deteriorating water quality, **elected leaders from nine municipalities around Lake Winnipeg united** as the South Basin Mayors and Reeves to launch the Lake Friendly Initiative, a community-based approach designed to build public awareness. The initiative aims to engage all sectors of society in a solutions-focused approach to preserve our fresh water resources.
2007, 2012 **Lake Winnipeg Basin Initiative (LWBI)**	Environment Canada's Lake Winnipeg Basin Initiative (Phases I and II) provided $35.7 million in funding over ten years under three program pillars: **1) Science; 2) Stewardship Action; and 3) Transboundary Partnerships**. LWBI initiatives are aimed at improving water quality in Lake Winnipeg by engaging citizens, scientists and domestic and international partners in action, emphasizing the link between land and lake.

2010 **Watershed Systems Research Program (WSRP)**	Established by the Government of Manitoba in response to recommendations from the Clean Environment Commission and the Lake Winnipeg Stewardship Board, WSRP advanced research examining the impacts of watershed management on water quality, with a particular focus on **innovative, on-farm water and crop management systems for water retention and nutrient capture.**
2011 **State of the Lake Report: 1999-2007**.	Released by the Province of Manitoba and the Government of Canada, the State of the Lake Report summarized research on the eutrophication of Lake Winnipeg and provided data to 2007 to **assist in the development of nutrient objectives** and performance indicators for the lake and its watershed. Concluding that eutrophication has accelerated in recent years and is the primary factor affecting lake health, **both levels of government committed to work collaboratively** to improve the health of the lake.
2011 **Lake Winnipeg Quota Review Task Force**	Established by the Minister of Water Stewardship, the task force included three fishers, three scientists and an independent chair, and was charged with reporting on productivity and assessment of the fish stocks of Lake Winnipeg. Finding significant uncertainty in the fishery data, the task force made seven recommendations, including the **development and implementation of an adaptive management framework for sustainable stock management.**
2012 **Lake Winnipeg Basin Information Network (LWBIN)**	Established by Environment Canada through the Lake Winnipeg Basin Initiative, and now managed by the University of Manitoba, LWBIN is a **web-based open access data and information network,** advancing the Government of Canada's commitment to ensure the **preservation and accessibility of publically-funded data.** The network is a long-term repository for Lake Winnipeg information.
2013 **Lake Friendly Stewards Alliance (LFSA)**	Convened by the Government of Manitoba and the South Basin Mayors and Reeves, LFSA includes representation from federal, provincial, and municipal governments, as well as from diverse sectors including academia, non-profit and charitable organizations, industry, cottager associations, and transboundary groups. The Alliance advances the Lake Friendly Accord, **a pledge committing signatories to work collaboratively to reduce nutrient loading to waterways, and to report annually on progress.**
2014 **Manitoba's Surface Water Management Strategy**	Developed with extensive stakeholder engagement, Manitoba's Surface Water Management Strategy highlights the **integrated nature of land and water management**, and their importance for a sustainable and prosperous future. The strategy emphasizes the need to **protect and enhance water storage capacity and wetland function** to provide the triple dividend of water quality enhancement, flood and drought mitigation, and carbon sequestration.
2014 **Lake Winnipeg Indigenous Collective (LWIC)**	With participation from 14 First Nations from around Lake Winnipeg, LWIC **strengthens Indigenous voices in addressing impacts of development and deteriorating water quality** and ensures that the connection between lake health and community health is respected. LWIC envisions a future where our sacred waters are healthy, traditional livelihoods are restored and Indigenous perspectives are influential in leading the protections and sustainability of Lake Winnipeg as a source of life for all Future generations.
2014 **IISD-Experimental Lakes Area (IISD-ELA)**	A **unique whole-ecosystem research facility** in northwestern Ontario, findings from long-term studies at IISD-ELA have been instrumental in changing policy and informing public investments around the world and here at home. Based on its presence in Winnipeg, IISD-ELA will continue to provide key answers to the challenges facing Lake Winnipeg in areas such as eutrophication, water quality, fisheries and whole ecosystem science.

LFSA

CURRENT OPPORTUNITIES

GLOBAL

Globally a few historic developments shape our path forward. In December 2015, world leaders agreed to reduce greenhouse gas emissions by significant amounts as part of the Paris Agreement. The Sustainable Development Goals similarly mark a historic breakthrough, as countries agreed in September 2015 to advance seventeen coherent and universal sustainable development goals and targets.

On the fringes of these historic global events, other global trends relevant to the management of large landscapes are becoming increasingly apparent. The first that many of the current and future effects of climate change that are being described across scientific and popular literature as "tipping points" are also causing abrupt tipping points in our social and political systems. Abrupt social tipping points caused by floods and droughts for example, can have immediate consequences such as property loss, job losses, dislocation and effects on public health. Amplifying this across geographical scale and timelines can contribute to political instability, civil conflicts that lead to large-scale human migration which have effects that extend beyond the regions in which these shocks occur.

The Millennium Ecosystem Assessment in 2003 stated that a future scenario consistent with improved provision of nature-based benefits or ecosystem goods and services is one in which "regional watershed scale ecosystems are the focus of political and economic activity."

A review of literature looking at meta analyses involving watershed management case studies highlighted the need for clear leadership with multiple stakeholders representing the various components of these often complex landscapes. Potential leadership roles include management planning, knowledge and information brokering, long-term financial resources, and guidance for planning and execution of any management plan. The specific nature of leadership varies across the world and includes a central government agency (such as the Warta Watershed in Poland); or an inter-governmental body (e.g. Murray Darling Basin in Australia); to a multi-stakeholder non-governmental organization (such as the Fraser Basin in Canada).

CANADA

In Canada, a new Liberal government has brought renewed energy and efforts on climate change mitigation and adaptation, water management, green infrastructure, scientific research, agri-environmental stewardship and a sense of pride and a reputation for environmental stewardship. Specifically, mandate letters for Canadian ministries commit to renew their commitment to protect the Lake Winnipeg Basin and to help the agricultural sector adjust to climate change and better address water and soil conservation; restore funding for freshwater research, deliver significant new funding for infrastructure including green infrastructure, local water and wastewater facilities, clean energy, climate resilient infrastructure like flood mitigation systems and infrastructure to protect against changing weather. In addition, to election platform commitments and mandate letters, we've

also seen these as specific commitments through allocations in the federal budget 2016. For example, a $120 billion commitment for the next 10 years towards infrastructure includes $2 billion for water and wastewater treatment and provision over the next four years. In addition, commitment and investments are made for ocean and freshwater research ($197.1 million over five years); supporting the resiliency and environmental sustainability of the agricultural sector to ensure long-term adaptation and growth; implement programming focused on building the science base to inform decision-making, protecting the health and well-being of Canadians ($129.5 million over five years); enable Canada to match U.S. funding on trans-boundary waters management through the International Joint Commission ($19.5 million over five years).

MANITOBA

Lake Winnipeg does not have to reach what scientists would officially declare an ecological tipping point in its state to trigger social and economic tipping points that undermine the prosperity of the communities that surround it with huge consequences for the economy of Manitoba and negative impacts on the quality of life for all Manitobans. Long before science can definitively pronounce with confidence that an actual tipping point has been crossed that will result or has resulted in the collapse of the lake ecosystem – the breaching of invisible and irreversible social, economic and political thresholds may have already occurred.

The reputation of affected communities could be damaged, tourism can decline in such places, long-standing cottage country status can be lost, property values may have dropped and the effect of all of these combined impacts being an out-migration from impacted regions.

Fortunately, we know how to solve problems like this one. It won't be easy but we know what we need to do. The problems we face here in Manitoba have been encountered elsewhere in Canada and widely around the world. We have good examples from which to borrow. We also have renewed municipal, provincial and federal commitment to address the problem.

Manitoba government priorities and commitments also offer opportunities for integrated management of land, water and related resources for positive benefits to Lake Winnipeg including its basin and other Manitoba lakes such as Lake Manitoba. Commitments in provincial mandate letters and the budget include the implementation of a province-wide program based on the alternative land use services (ALUS) model to help reduce flooding, improve water quality and nutrient management, implement watershed-based planning for drainage and water resource management with a goal of no let loss of water retention capacity in watersheds, develop and implement a credible strategy to secure certification of Manitoba's commercial fisheries, develop a made-in-Manitoba climate action plan that includes land-use measures that sequester carbon and foster adaptation to climate change, build flood protection infrastructure to keep Manitobans safe, including around Lake Manitoba.

LOCAL/MUNICIPAL

The South Basin Mayors and Reeves, leaders from the nine communities on the shores of Lake Winnipeg and most impacted by its state, created the Lake Friendly Initiative - a community engagement and outreach initiative designed to develop and communicate clear positive action toward behaviour change across the basin. Building on the success of this initiative and the demonstrated municipal leadership the Lake Friendly Stewards Alliance Steering Committee (LFASC) was formed in partnership with the Province of Manitoba and is, comprised of federal, provincial and municipal government representatives and stakeholders from across agriculture, industry sectors, trans-boundary organizations as well as NGOs working in the basin.

LAKE FRIENDLY STEWARDS ALLIANCES AND ACCORD

The Lake Friendly Stewards Alliance Steering Committee was tasked with identifying priorities and aligning action to improve water quality. They have also worked with the Province of Manitoba to undertake partnership commitments through the signing of an Accord with corresponding annexes that detail action and commitment toward nutrient reduction and protection of water quality.

The Lake Friendly Accord is a vehicle for engagement across borders, provinces, business and industry, and stakeholder groups that orchestrates and rapidly implements solutions to the kinds of problems Lake Winnipeg symbolizes not just in Canada, but around the world.

Among the signatories, with corresponding annexes are: the Government of Canada, the Government of Manitoba, South Basin Mayors and Reeves, Red River Basin Commission, Manitoba Hydro, the Lake Winnipeg Foundation, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources, Canadian Water Resources Association, Ontario Ministry of the Environment and Climate Change, Alberta Environment and Parks as well as important research institutions in Manitoba (such as the University of Manitoba) and elsewhere. In addition, critically important agriculture partners are involved who without them, this problem cannot be solved.

The signatories have made clear, tangible commitments, not just to solutions, but to on-going cooperation to address the accelerating problem of eutrophication not just in Lake Winnipeg but throughout the region. It is important to note that the Lake Friendly Stewards Alliance Steering Committee also has a clear plan with priorities for action.

The Accord and the Alliance shows that we have solid organizing principles that will allow us to work effectively together in order to activate the promises made in these documents.

All we need now is an organizing agent; a recognized leadership group with authority to unify all interests with the goal of mobilizing action for impact.

" All we need now is an organizing agent; a recognized leadership group with authority to unify all interests with the goal of mobilizing action for impact."

WORKING TOGETHER

WORKING TOGETHER ACROSS JURISDICTIONS

The sustainable management of Lake Winnipeg and its basin is a collective responsibility and no single government department or non-governmental agency has the mandate or the capacity to tackle this complex issue. While federal departments have responsibilities, commitments and resources for specific aspects, particularly relevant to the trans-provincial, trans-sectoral and transboundary nature of the basin, academia, research and non-governmental agencies transcend the political boundaries and timelines that limit governmental agencies. Together these different groups must find a way to coordinate and mobilize action to address the complex challenge of managing the Lake Winnipeg Basin.

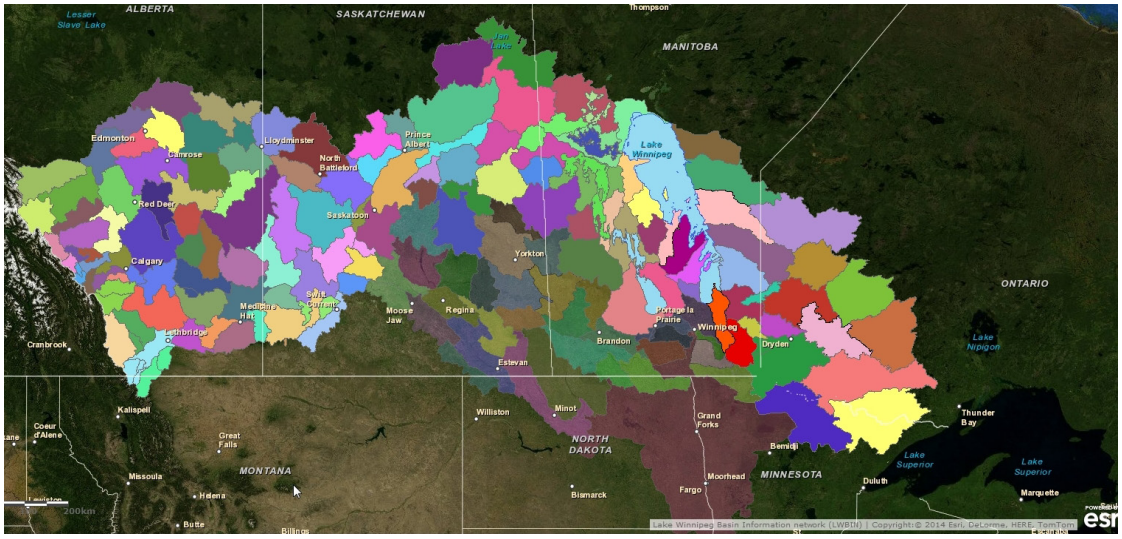


Figure 2: Lake Winnipeg Basin - A Basin of Basins. Source: Lake Winnipeg Basin Information Network

Within the Canadian government, actions related to the health of the Lake Winnipeg Basin involve Environment and Climate Change Canada, Fisheries and Oceans Canada, Canadian Coast Guard, Natural Resources Canada, Infrastructure and Communities, Agriculture and Agri-Food Canada and Global Affairs Canada. In addition, a corresponding range of departments exist at the provincial and state levels within the four provinces and four states of the basin. As well, municipal and Indigenous governments and other agencies are all contributing resources, actions, research and outcome measurement that can be harnessed for a coordinated effort toward protecting water in the Lake Winnipeg Basin and beyond.

This joint call for an evolution of current efforts to broader, basin-wide efforts through more strategic mobilization presents an opportunity to achieve the federal government's mandate of evidence-based decision-making, stronger collaboration, open and transparent government and nation-to-nation relationships with Indigenous communities and international leadership.

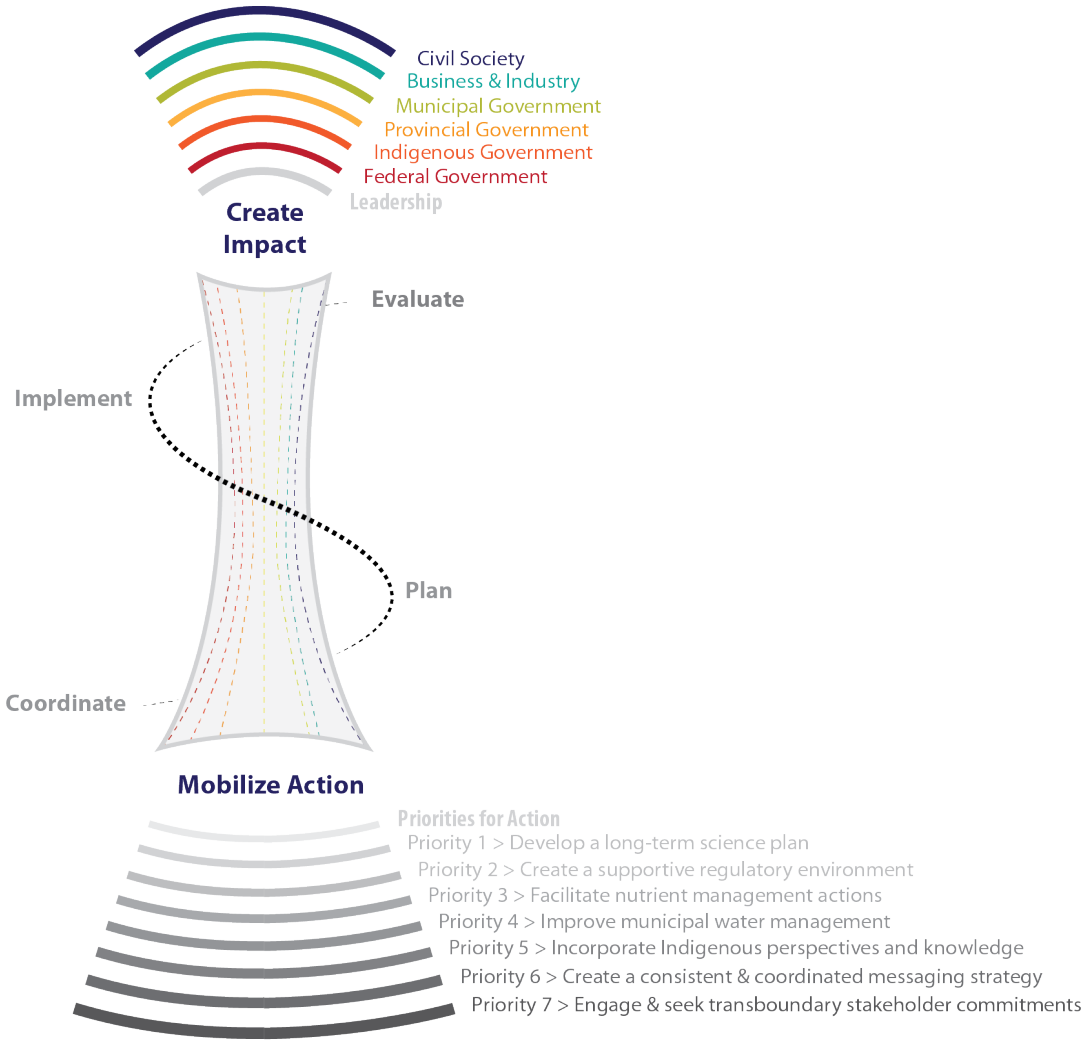


Figure 3: Mobilizing Action for Impact - Priorities identified in Priorities for Action aligned with multi-jurisdictional actors and action.

The following section articulates actions aimed at overall management of the Lake Winnipeg Basin. The long-term goal is for coordinated management of the Lake Winnipeg Basin through the establishment of a multi-agency coordinating body – a Lake Winnipeg coordinating agency that identifies the needs, prioritizes actions and allocates resources to ensure the most efficient and impactful action on the articulated goals for the basin.

COORDINATION & OVERSIGHT

The time has come for effective coordination with stable resources to oversee and support long-term adaptive management of Lake Winnipeg and its basin. The overall goal will aim for a healthy Lake Winnipeg and basin based on long-term thinking and science-based actions, collaborative efforts and inclusive and transparent reporting of efforts and outcomes through the leadership of a Lake Winnipeg organizing agency. In other words, Plan, Act and Report in a highly coordinated manner (Table 2).

The establishment of a Lake Winnipeg organizing agency, in accordance with international best practice, would provide the framework within which to align actions and resources, develop and oversee the completion of commitments within a Lake Winnipeg Action Plan for measurable outcomes against a long-term vision for a healthy Lake Winnipeg and Basin. Figure 4 on page 19 provides an illustrative representation of this coordinating agency.

Table 2 below: Three pillars forming the basis of the proposed actions. Coordination of the development of an overarching Action Plan (Plan), its implementation (Act) and communicating on collective actions and outcomes (Report) is required to ensure measurable positive impacts for the long-term health of prairie waterways, including Lake Winnipeg.

Proposed Pillar		Objective
Coordination	**Plan**	Develop an action plan including objectives, actions, outcomes, indicators/performance measures and timelines. This overall plan will build from existing science and adaptive management efforts for the Lake and its basin and address existing gaps.
	Act	Align and implement actions toward a common vision and goals. This includes current and proposed actions in infrastructure, agriculture, land use management, municipal actions, and other actions related to priorities for the Lake Winnipeg basin.
	Report	Provide regular, long-term data and information on ecological and related priorities in the Missing Lake and its basin to ensure that residents and agencies are informed and that multi-stakeholder actions bstimulated in complementary ways.

Figure 4: Illustrative representation of multi-stakeholder Lake Winnipeg Coordinating Agency comprising representation from different levels of government, research, and civil society.

THE PILLARS

PILLARS FOR COORDINATING & MOBILIZING ACTION

The following presents each of the three proposed pillars - Plan, Act and Report - highlighting necessary actions to be taken over the short- and long-term with the aim at the realization of the vision for a healthy Lake Winnipeg and its basin.

PILLAR 1: PLAN

Flowing from the Lake Friendly Stewards Alliance Steering Committee *Priorities for Action Document*, plan to develop a comprehensive, long-term, integrated Action Plan that is based on an adaptive management framework for lake and watershed, supported by the best available science to inform decision-making, and driven by a collective Vision for a healthy Lake Winnipeg and Basin.

First and foremost is addressing the need for a clear guiding vision for the long-term health of Lake Winnipeg and its basin. This will help align actions, while also clarifying the need for engaging agencies working on complementary issues such as land use, agriculture, innovation and research, scientific assessments, adaptation to climate change, etc.

The Action Plan must also include defined challenges, clearly articulated management goals and objectives, and actions for implementation based on a long-term, collective vision for lake and basin.

Coordinated planning requires taking stock and building on past and current efforts and

- Identifying and compiling existing commitments, resources, policies, legislation, programs and other initiatives to align efforts, resources and indicators. This will lay the foundation for institutional roles and responsibilities, policy mechanisms, cost-efficient and impactful actions for more coordinated efforts for a healthy Lake Winnipeg and Basin.

- Taking stock of current and upcoming priorities relevant to the articulated vision for the lake and its basin, through different agriculture, infrastructure, municipalities, land use management, habitat and biodiversity management, tourism etc. Such planning will aim to align resources and actions in a variety of different sectors and at different levels of government and provide the foundation from which coordinated actions take place.

- Conducting an inventory of existing science and management efforts across the Lake Winnipeg basin. This is a critical step in identifying and characterizing the role, responsibilities and status of the multiple government and non-government agencies, academic programs, and others who contribute at some level to knowledge acquisition and management systems.

- Building on existing efforts of the multiple government agencies with management and science responsibilities for Lake Winnipeg and its basin, as well as the diverse efforts of non-governmental agencies, stakeholder groups, and input from the Public, with consideration for existing plans and programs, in whole or in part;

- Be consistent with federal and provincial environmental legislation and regulatory policies.

All told, the Action Plan will include the requisite components that are integral to an adaptive management framework - Plan; Do, Evaluate and Learn (Figure 5) – from the context of the lake and basin collectively. Other adaptive management regimes, such as for fisheries and water quality, would reside within this overall framework. By necessity, further development of relevant and meaningful social, economic and environmental indicators would be an integral component of the Action Plan in order to evaluate the success of actions and communicate progress toward achieving its goals. Again, this effort will build on current initiatives, such as the development of lake and watershed indicators, but within the context of a larger, coordinated vision. Indicators will also serve to guide the ongoing amendment of the Action Plan as new scientific knowledge is acquired and applied to management decision-making through an adaptive management framework. As a living, guiding document, the Action Plan will be reviewed and updated on a regular basis.

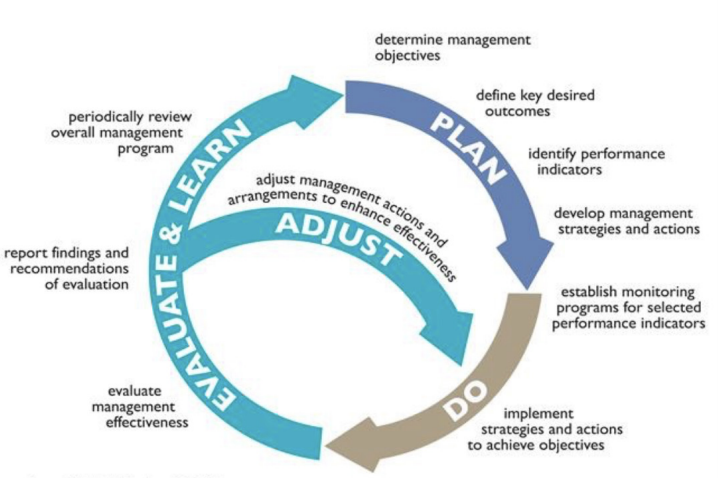


Figure 5: Conceptual diagram of the adaptive management framework based on three phases – Plan, Do, Evaluate and Learn. Source: DPIPWE 2014 after Jones 2005, 2009.

PILLAR 2: ACT

A comprehensive Action Plan will guide the implementation of coordinated action and the strategic allocation of public funds toward a common vision over the long term. All the while, there are existing, integral initiatives with strong momentum that will require continued support. They include:

Continued support of the Lake Winnipeg Basin Initiative (LWBI)

This initiative requires ongoing support. In addition, there is a need to expand to include a greater commitment to an ecosystem-based approach (described below) that extends beyond nutrient reduction to support whole lake health. Priorities of the LWBI should also be more effectively aligned with priorities of coordination, planning, implementation and reporting including implementation of upgrades in infrastructure including wastewater treatment flood infrastructure, development of effective agri-environmental programming, climate adaptation efforts and other actions in support of Federal and Provincial management objectives.

Funding support for the existing whole ecosystem Science Plan (LWRC 2015)

In recent years, nutrient abatement in Lake Winnipeg's basin has become the predominant focus of government-led programs such as the Lake Winnipeg Basin Initiative. While eutrophication is a major water quality concern, it cannot be managed in isolation from the fishery since a reduction in nutrients could translate into reduced productivity of the fishery. Consequently, nutrient targets that are both ecologically and economically relevant will be difficult to define and adaptively manage without more knowledge of the food web linkages between nutrient supply and fish productivity, and vice versa – the lake cannot be managed for a sustainable fishery without this knowledge about nutrient and food web linkages.

Given that additional stressors are acting on the lake ecosystem, such as climate change and numerous exotic species, the most recent (but certainly not last) of which being zebra mussels, it becomes clear that this is not simply a matter of reducing the size of algal blooms by reducing nutrients in the basin. Indeed, evaluating the reduction in the extent of algal blooms, if any, in response to nutrient abatement actions being undertaken in the basin will be next to impossible without a better understanding of the impact of zebra mussels on nutrient cycling within the lake itself. This is a complex reality that necessitates the integration of adequate research, monitoring and modeling efforts at the whole ecosystem level. Moreover, the inherent uncertainty associated with multiple stressors acting on the lake and its basin over differing temporal and spatial scales calls for an adaptive management regime in order to evaluate and respond appropriately based on the best available science. The strategic allocation of public funds will also provide greater flexibility to be responsive to this uncertainty.

Implementing the existing whole ecosystem Lake Science (LWRC 2015) could advance through a more strategic dissemination of funds targeted at priority research and monitoring projects that require greater integration of disciplines and inter-agency collaboration. It is highly probable that these projects would otherwise not be addressed through current funding initiatives or limited agency capacity. Although monitoring efforts generally require a long-term commitment, it is imperative that some programs be enhanced immediately in order to capture the limited window of opportunity of early zebra mussel infestation that we are currently presented with. All projects directly support provincial management objectives, as well as provide important input for existing model development by ECCC and academia. They include:

- Enhance near-shore framework beyond water quality;
- Food web changes and interactions (stable isotopes, diet) in the near and offshore;
- Fish stock discrimination, movement and migration (lake whitefish, sauger);
- Participatory monitoring by fishers (characterizing by-catch, lake whitefish);
- Geo-mapping (course resolution for substrate heterogeneity); and
- Zebra mussel distribution.

Improved access to information and data sharing through continued development of the Lake Winnipeg Basin Information Network (LWBIN)

The LWBIN serves as a valuable tool in bridging the collection and long-term accessibility of data, as well as housing information over the long term. Enhanced support for the Lake Winnipeg Basin Information Network (LWBIN) would:

- Continue to populate the LWBIN with existing data, reports and information products from the various agencies working on Lake Winnipeg and its basin.
- Engage a broader user-base (citizen scientists, conservation districts, etc);
- Help to standardize data management among these diverse user groups; and
- Ensure ongoing development and management of both the back and front ends of the database.

PILLAR 3: REPORT

The timely, transparent, and strategic dissemination of accurate and relevant information to the general public, educational institutions, media, stakeholders and decision-makers cannot be over-stated. At present, however, the media largely informs, or rather mis-informs, the public and others on the state of the lake. Messaging about a "dying" or "toxic" lake, the "worst managed fishery in the world" and the "most threatened lake in the world" is all based on sensationalized efforts to garner a headline or attention, and is not remotely supported by scientific evidence.

There are many facets to effective reporting, which can be broadly categorized into "data" and "information". In the context of Lake Winnipeg and its basin, data is required in order to generate the information to communicate or disseminate on progress made toward a "healthy" and sustainable Lake Winnipeg and basin. The strategic dissemination of information takes communications one step further in that it actively targets its audience.

Some important considerations in terms of data and information that should be considered in moving forward with a more coordinated reporting effort include:

- Collaborative nature of scientific data collection by multiple agencies;
- Necessity and value of peer evaluation;
- Importance of sharing data and/or other forms of information;
- Long term data storage and accessibility (Lake Winnipeg Basin Information Network).
- Necessity to synthesize (bring together and interpret) data from multiple agencies and across disciplines; and
- Diverse reporting obligations for information, from plain language to peer-review that occur on different time scales.

Formalize a process for more effective alignment of multi-agency and multi-disciplinary efforts toward the development of State of the Lake and Basin reports in a timely manner.

As these reports are science-based, their development is integrally linked with the collection, interpretation, synthesis and evaluation of scientific data collected in support of management objectives and obligations. They are also a prerequisite for the strategic dissemination of information to targeted audiences. Their timely development, therefore, is a crucial step in countering the perpetual offering of mis-information by the media and others.

Develop a process for the strategic dissemination of information derived from the State of the Lake and State of the Basin reports in a timely, transparent manner for clear and effective messaging on the status of Lake Winnipeg and progress toward achieving common goals.

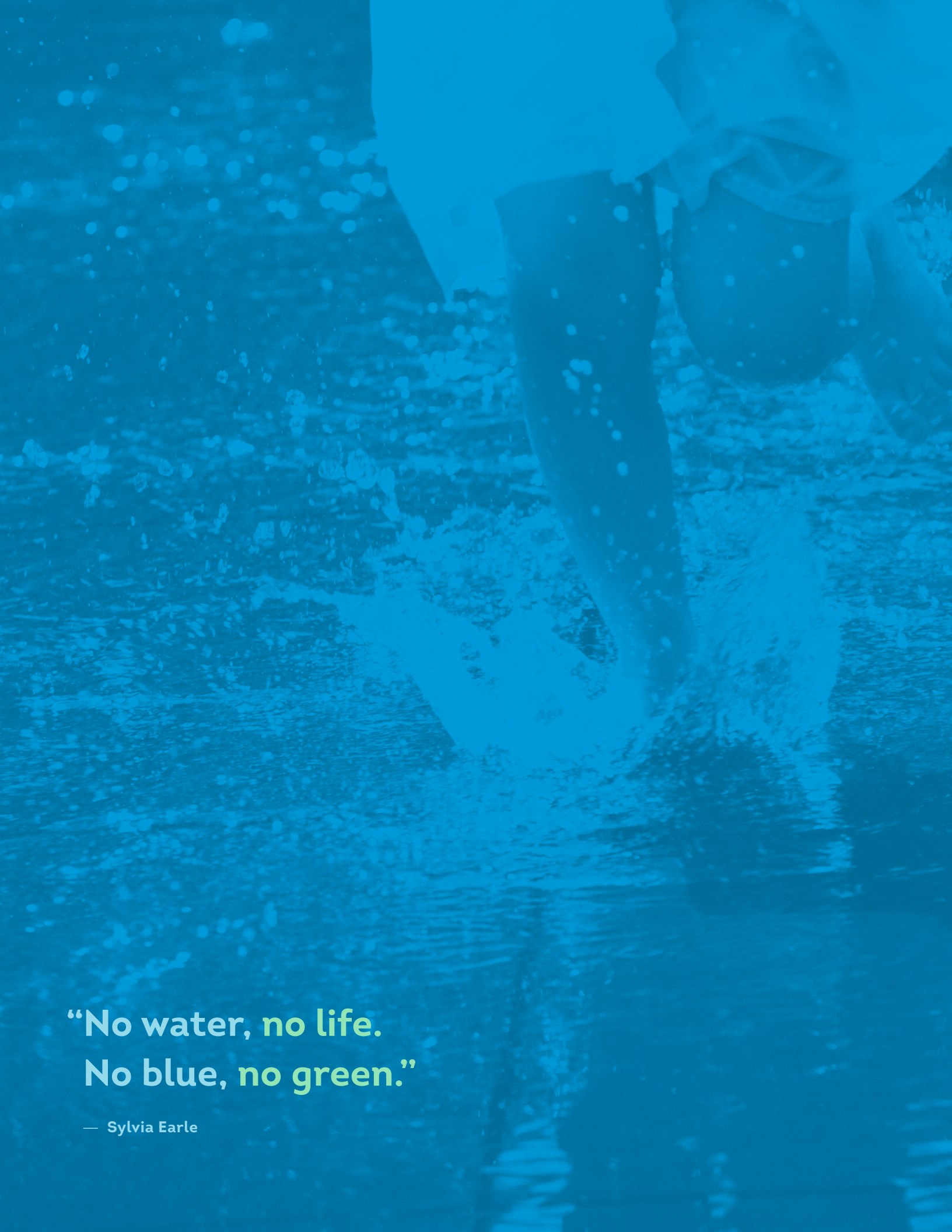
This will include holding a State of the Lake and Basin Forum every two years in an effort to encourage the active engagement of the public and stakeholders in the stewardship of land and waters.

SUMMARY

It is recommended that the provincial government propose to the federal government that a new organizing entity be created to make genuine progress on solving Lake Winnipeg's challenges.

This new entity must have clout; it must have the legislative authority and resources to reduce point and non-point sources and influence land use policies and water management practices. It must have the leadership ability to coordinate, unify and mobilize actions across the basin.

In our view, there is urgency in moving quickly in the direction of better organized, cooperative action on the problems Lake Winnipeg represents and symbolizes. While the state and future of Lake Winnipeg matter a great deal to all of us, there is something far greater at stake here. The ultimate goal to which we are aiming is to preserve this province's prosperity while making Manitoba a place where people want to live not leave in a warming world. That goal is within our grasp if we act wisely now.



“No water, no life.
No blue, no green.”

— Sylvia Earle