At the Shoreline: A Mayors' Collaborative Action Plan to Protect the Great Lakes



Mayors and Chairs' Advice to the Government of Ontario on Local Great Lakes Priorities

May 2009

Great Lakes and St. Lawrence Cities Initiative
Alliance des villes des Grands Lacs et du Saint-Laurent

Acknowledgements

This report is the product of the ideas, efforts and suggestions from many people.

The Great Lakes and St. Lawrence Cities Initiative and the Municipal Working Group would like to thank the Province of Ontario for organizing the Canada-Ontario Agreement Memorandum of Cooperation Joint Municipal-Provincial Committee (see Appendix 4) meetings and providing a wealth of information on the different provincial initiatives and research underway. We appreciated the interesting and informative discussions, along with suggestions for future collaboration and projects.

Thank you also to the Great Lakes Mayors and Chairs (see Appendix 2) who communicated the key messages and advice to Ministers and generously made their staff available for this process.

The Great Lakes and St. Lawrence Cities Initiative would also like to thank the Municipal Working Group, including the Association of Municipalities of Ontario, who shared their perspectives, ideas and advice (see Appendix 3).

Contents

Executive Summary

'At the Shoreline' is the first Ontario Mayors and Chairs' report on the Great Lakes, presented to the Honourable John Gerretsen, Ontario Minister of Environment, the Honourable Donna Cansfield, Ontario Natural Resources Minister, and the Honourable Leona Dombrowsky, Ontario Minister of Agriculture, Food and Rural Affairs. It represents a historic milestone, recognising the vital role cities, regions and towns play in protecting the Great Lakes. The report consists of a five-point action plan and key recommendations to forge a stronger relationship and strategic coordination among the three orders of government to protect and promote the Great Lakes.

Great Lakes Mayors recognize the importance of Great Lakes protection to the wellbeing of their communities. Municipalities have direct responsibilities related to the protection of the Great Lakes, from providing drinking water to 9 million Ontarians, to managing sewage and stormwater outflows into the lakes, to operating beaches, marinas, waterfronts and natural areas. Mayors are also interested in maintaining the quality of the Great Lakes to promote local economic development and to enhance people's quality of life. Municipalities are collectively the largest financial contributors to the protection of Great Lakes. Local governments in Canada and the United States invest over $15 billion every year to protect and restore the Great Lakes and St. Lawrence River system.

This protection is particularly important at the shoreline, where municipalities meet the water. The shoreline is where most people interact with the lakes and where their experience of the lakes is formed. The nearshore also plays a vital role in preserving a healthy environment for fish and other aquatic species.

This Mayors' report grows from a new collaborative process between Ontario municipalities and the provincial Government established under the Great Lakes Canada Ontario Agreement Memorandum of Cooperation (COA MOC). The Agreement establishes a municipal-provincial dialogue on Great Lakes issues of mutual interest, and creates a forum for Mayors to give their strategic advice to the provincial government for the upcoming negotiations of the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA).

With the anticipated renegotiation of COA in 2010, now is the time for the three orders of government to reach agreement on the most effective means to work together to protect the Great Lakes, including agreeing on priorities for action, strategic investments, sharing scientific and technical advice, and collaborating on research and programs.

The Mayors propose five areas of collaboration:

1. Create a municipal-provincial-federal Great Lakes table

The time has come for a new collaborative relationship among federal, provincial and municipal governments to reinvigorate and reorient Great Lakes protection for the benefit of the people who live and play at the shoreline. Currently, there is no senior forum where federal, provincial and municipal governments come together to coordinate their Great Lakes protection activities and plan for the future.

The Great Lakes Mayors are calling for a federal-provincial-municipal Great Lakes Table that would serve to coordinate efforts and share vital information. The Great Lakes MOC process has demonstrated the value of municipal and provincial dialogue to help inform provincial planning for its Great Lakes strategy and to develop collaborative work like this action plan.

2. Improve and promote beaches and natural shorelines

There may be no better way to strengthen the public's connection to the Great Lakes than to enhance and promote beaches and other shoreline activities such as wetlands, natural areas and trails. Drawing more people to the shoreline can also boost local economies and contribute to healthier lifestyles. With a greater share of Great Lakes shoreline than any other jurisdiction, it makes sense to promote Ontario as a major beach and shoreline destination.

While municipalities and local authorities play a large role in managing beaches and shoreline areas, we need to coordinate and collaborate with the provincial government to be successful in improving beaches and shoreline areas. The Mayors call for the development of a joint beaches strategy, with a target date of 2015 to have Ontario beaches open a minimum of 80% of the swimming season. This target can be achieved through provincial-municipal collaboration on improved beaches management, enhanced monitoring techniques, and the promotion of public information on the state of Ontario's beaches.

The Mayors would also like to work jointly with the provincial government to enhance, protect and promote other shoreline areas like trails and wetlands. This would also bring more people to the shoreline, foster people's connection, appreciation and enjoyment, increase healthy lifestyles and promote local tourism.

3. Attack nuisance and toxic algae

Parts of Lake Ontario, Lake Erie and Georgian Bay are struggling with explosive growth of algae. Not only is it unsightly and smelly, it can also clog industrial and municipal intake pipes, resulting in millions of dollars in costs, and can contribute to depreciating shoreline property values. There has been considerable research on the causes of algal growth, but less clear policy direction and action to attack it. It is a complex problem that requires action at both the local and lakewide level, requiring collaboration of all three orders of government and other partners.

The Mayors are calling for a comprehensive algae control plan to reduce nutrient concentrations and to address other contributing factors to prevent nuisance growth of algae. The control plan should be based on solid science,

which identifies the most significant sources of nutrients contributing to algal growth. All governments need to work together and support new measures to reduce nutrient loadings and concentrations from these sources.

4. Reduce untreated sewage and stormwater discharges into the Great Lakes

The Mayors support a significant reduction of untreated or inadequately treated sewage and contaminated stormwater being released into the Lakes. To achieve this will require increased collaboration, investments and new creative approaches from all three orders of government. The challenge is all the more daunting in the face of increased precipitation due to climate change, and urban intensification. While increased investments in sewage treatment capacity will always be needed, there are also less capital intensive technical innovations that place the emphasis on 'moving up the pipe', that is, reducing the flow of stormwater and sewage that enters the treatment system, bypasses or overflows from it after heavy rainfalls.

The Great Lakes Mayors are calling on the federal and provincial governments to work collaboratively with municipalities, by providing policy guidance and technical and financial support, to adopt new approaches and innovations in their integrated stormwater management plans that prioritise reduction and reuse over treatment and retention. This could include source controls, aggressive water conservation measures, and green infrastructure, among other techniques. This new 'moving up the pipe' approach could also be incorporated into developing, updating and implementing pollution control and prevention plans and other methods to reduce untreated sewage discharges.

Support is also needed to assist the municipal sector to develop and implement climate change action plans, and to adapt their stormwater and wastewater infrastructure design to climate change, and test new techniques.

5. Build a business case and measure results of Great Lakes investments

At all three orders of government, there is a lack of solid information on the benefits of investments in projects and programs that improve the quality of the Great Lakes. The Great Lakes Mayors would like to work together with the provincial and federal government and others on economic studies of the value of common Great Lakes shoreline activities, including economic modeling using local community input, both to develop the business case to drive investments in the Great Lakes and to measure the results of the investments made.

Great Lakes Mayors are committed to working in collaboration with their provincial and federal counterparts to ensure that people can enjoy the lakes and local communities can thrive at their shoreline. The Mayors are eager to begin this collaboration in the five areas identified in their Great Lakes Action Plan.

This Mayors' report, with specific recommendations, can be found at www.glslcities.org/.

The Great Lakes and St. Lawrence Cities Initiative is a bi-national coalition of over 60 mayors and other local officials that works actively with federal, state, provincial, tribal, and First Nation governments and other stakeholders to advance the protection, restoration and promotion of the Great Lakes and St. Lawrence River basin (see www.glslcities.org).

1. Introduction

Most Ontarians do not give much thought to the global significance of the Great Lakes, which contain 20% of the world's surface fresh water and 95% of North America's fresh water. In fact, Ontarians do not realise they live in the Great Lakes basin. Nor do we think about the value of the Great Lakes basin to the Province's economic standing, supporting 25% of Canada's agricultural production, 45% of its industry, and providing safe and affordable drinking water to over 9 million Ontarians.

We do, however, appreciate the lakes when we walk along the Toronto boardwalk on Lake Ontario, paddle our canoe along Lake Superior's North Channel, take the family swimming at Lake Huron's Sauble Beach, or pitch a tent at Long Point on Lake Erie.

It is our local experience that defines how we value the Great Lakes in our lives. That is why the Great Lakes and St. Lawrence Cities Initiative entered into an agreement with the Government of Ontario to provide advice on protection of the Great Lakes from a municipal perspective.

Considerable progress has been made over the last 40 years, primarily through the Canada-Ontario Agreement on the Great Lakes Basin Ecosystem, in reducing toxics entering the lakes and in site-specific clean-ups. But municipalities strongly support the introduction of new protection measures, specifically to enhance people's connection to the lakes, and to promote new approaches to municipal operations in stormwater and wastewater management.

The Great Lakes and St. Lawrence Cities Initiative is a bi-national coalition of 60 mayors and other local officials that works actively with federal, state, provincial, tribal, and First Nation governments and other stakeholders to advance the protection, restoration and promotion of the Great Lakes and St. Lawrence River basin (see www.glslcities.org).

The Great Lakes and St. Lawrence Cities Initiative, on behalf of all Ontario municipalities, coordinated a discussion of local issues of interest on the Great Lakes. Over the course of six months, senior municipal representatives discussed their common local needs, and met with provincial officials to discuss areas of mutual interest.

In the process, priorities emerged that reflected what is important to the people who experience the lakes at the local level. These experiences are primarily activities along the shoreline of the lakes. They include enjoyment of beaches, concern over algae as it affects the nearshore environment, protection of the natural heritage system, appreciation of the interconnectedness of the Great Lakes ecosystem, and enhanced tourism and trails around the lakes. What is most striking about these activities and experiences is that, by and large, they are not reflected as priorities within existing federal and provincial programs and funding for Great Lakes protection.

Municipal representatives also recognized the significance of municipal operations on the quality of the nearshore, including the impact of stormwater run-off and untreated sewage, particularly after heavy rains. Traditional approaches to these long standing problems need to be reassessed in light of climate change, increasing urban intensification and with the

development of new and innovative techniques to reduce the amount of sewage and stormwater 'at source'. While investments in increased treatment capacity will always be needed, Mayors recognise that new approaches that reduce the amount of sewage and stormwater entering the treatment process are also needed.

In identifying priority areas for action, mayors see the need for an integrated approach, one that includes an appreciation of the contributions and linkages from all pollution sources, and an understanding that tributaries and watersheds are an important part of nearshore impacts.

Most importantly, the Mayors recognized that progress on improving local nearshore quality requires the commitment and collaboration of all three levels of government. For many years, federal and provincial programs have been developed and implemented with limited municipal input, even as the municipal stake and municipal investment in the Great Lakes has grown. This report calls for a new approach, which brings together the resources, creativity and expertise of all levels of government for the betterment of the lakes.

1.1 Great Lakes Issues of Importance to Municipalities

There are many pressing issues facing the Great Lakes, which require the attention of provincial and federal governments, such as invasive species, toxic contaminants in the water and the air, and an unwieldy governance structure, among others. The Mayors did not set out to develop a comprehensive plan for Great Lakes protection, but rather to identify key issues of local interest that are not receiving the attention that some of the more commonly identified problems are. The five issues identified in this report have been chosen based on their impact on people's enjoyment of the lakes, and due to the substantial municipal stake in the protection and promotion of the lakes.

Municipalities have a strong vested interest in the protection and promotion of the Great Lakes. From an operational perspective, municipalities are responsible for many activities that can have a direct positive, or negative, impact on the lakes, such as stormwater management and wastewater operations, land use planning, waste management, public transit, waterfront development, ownership of harbours, marinas and beaches, among others.

Municipalities are also interested in maintaining the quality of the Great Lakes as a means to promote economic development. An abundance of water attracts businesses and shipping, the quality of life that comes with living on the shores of the Lakes attracts families and workers, and well protected beaches and natural areas draw tourists from near and far.

Municipalities also have responsibilities to protect the Lakes that serve as a source of drinking water for 9 million Ontarians.

Municipalities are also collectively the largest financial contributors to the protection of the Great Lakes. A recent survey, conducted by the Great Lakes Commission and the Great Lakes and St. Lawrence Cities Initiative, found that local governments in Canada and the United States invest over $15 billion every year to protect and restore the Great Lakes and St. Lawrence River system, of which $4.3 billion is spent in Ontario and Quebec alone (Feb 2008).

Finally, municipalities benefit directly from people's enjoyment of the lakes at their doorstep, as it is regularly cited as a major element in people's quality of life, or, inversely, can become a major source of complaints to local elected officials when there are odour problems, posted beaches, or accumulated piles of algae on the shoreline.

1.2 The Canada - Ontario Agreement and the COA Memorandum of Cooperation

The Canada - Ontario Agreement on the Great Lakes Basin Ecosystem (COA) is the primary agreement between Canada and Ontario to protect Great Lakes water quality on the Canadian side of the lakes.

The COA performs two important functions. Firstly, it shapes and integrates federal and provincial Great Lakes programs and largely determines budget allocations for these programs at both levels of government. The COA defines common goals, results and respective roles and responsibilities at the federal and provincial levels to maintain and enhance Great Lakes water quality. Secondly, since 1972, the COA is the mechanism used by Canada to meet its obligations under the Canada-United States Great Lakes Water Quality Agreement (GLWQA), which defines common goals and results to be achieved at the bi-national level.

There have been seven versions of COA negotiated between the Federal Government and the Government of Ontario since 1971. The most recent version, signed in 2007, is due to expire in 2010. For more information about COA and progress reports, see www.on.ec.gc.ca/greatlakes/.

During the renegotiation of COA 2007-2010, the federal and Ontario governments pledged to improve opportunities for involvement of other partners, including municipalities, conservation authorities, Aboriginal peoples and other interested organizations. It is in this spirit that the Great Lakes and St. Lawrence Cities Initiative initiated negotiation of the COA MOC with the Government of Ontario.

In July 2008, the Ontario Government and the Great Lakes and St. Lawrence Cities Initiative signed the agreement of cooperation. The Canada Ontario Agreement Memorandum of Cooperation (COA MOC) commits the Cities Initiative to facilitate a process of engagement between Ontario municipal mayors and the three provincial signatory ministers to the COA: the Ontario Ministers of Environment (MOE), Natural Resources (MNR) and Agriculture, Food and Rural Affairs (MAFRA). It is important to note that the Cities Initiative facilitated this process on behalf of all Ontario municipalities, not just its Ontario members. The Association of Ontario Municipalities supported and participated in this process. To review meeting summaries, see www.glslcities.org.

The COA MOC process followed a two-track approach. First, over the course of six months, a Great Lakes Municipal Working Group, made up of senior municipal officials appointed by nine Ontario Great Lakes mayors and regional chairs, prioritized and developed common positions on Great Lakes issues of municipal interest. Over the same period, a Joint Municipal-Provincial Committee, made up of municipal working group members and provincial officials from MOE, MNR, and MAFRA, with the assistance of other Ministries including Tourism, and Health and Long Term Care, met to discuss issues that were of mutual interest. A meeting of elected officials, including Mayors and the three COA Ministers, in May 2009 discussed the priority issues and actions of importance to municipalities identified through the above process as well as areas of future collaboration.

This report is a product of these deliberations. While its main focus is in setting actions and goals for the next COA, some of the recommendations could be adopted by the Province outside of the COA framework.

1.3 Importance of the Great Lakes Shoreline and the Nearshore

The recommendations in this report focus on activities that occur at the shoreline or in the nearshore zone of the Great Lakes, rather than in the lakewide area. There are a number of reasons for this focus. Firstly, this is where most people interact with the lakes - their experience of the lakes is formed at the water's edge. Secondly, it is where municipal operations have an impact. And the nearshore plays a vital role in preserving the aquatic environment. The health of our shorelines is also the result of the health of our streams and watersheds. It is the dynamic among these kinds of activity that is the focus of this report.

The nearshore of the Great Lakes refers to the area from the edge of the shoreline to the deeper open water of the Lakes. The size of this area varies widely from lake to lake and shoreline to shoreline, with most of shallow Lake Erie considered the nearshore, to the deeper Lake Superior, which has only a very narrow ribbon of nearshore hugging the shoreline.

The nearshore plays an important role in the aquatic environment. It is where fish spawn and grow, and where wildlife comes to drink. Some areas of the Great Lakes nearshore are suffering the greatest threats due to the cumulative impact of point and non-point sources of pollution like agricultural runoff, municipal sewage, septic systems, urban stormwater, and animal and bird droppings.

In addition to the ecological damage, degradation of the nearshore zone directly impacts the public's recreational enjoyment of shoreline activities like swimming, boating, cottaging, fishing, beach visits, and waterfront activities like hiking, birdwatching, walking, and running.

It is also commonly the area where municipalities and industries take in drinking and cooling water and discharge wastewater and stormwater. Impairment to any of these activities has both direct health and economic costs to communities.

The International Joint Commission and a number of other organizations have been pushing in recent years for a specific focus on nearshore water quality in a new COA. Currently the COA does not include an annex dedicated to the nearshore, although there are aspects of the existing annexes that are associated with nearshore protection. The Great Lakes Water Quality Agreement does make numerous references to the nearshore throughout its articles and annexes, particularly Annex 3, on the Control of Phosphorus and Annex 13, Pollution from Non-Point Sources.

The Mayors are adding their voice to those calling on the federal and provincial governments to focus more effort on protecting the fragile nearshore zone.

2. Action Plan to Protect the Great Lakes

Based on discussions during the Canada Ontario Agreement Memorandum of Cooperation (COA MOC) process, the Mayors propose five areas of collaboration:

1. Create a municipal-provincial-federal Great Lakes table
2. Improve and promote Beaches, Natural Areas, Waterfronts, Trails and Tourism
3. Attack nuisance and toxic algae
4. Reduce untreated sewage and stormwater discharges entering the Great Lakes, in light of climate change and technical innovations
5. Build a Business Case and measure results from Great Lakes investments

The following sections of the report outline the components of this five point action plan along with key recommendations.

ACTION 1: Create a Municipal-Provincial-Federal Great Lakes Table

1.1: Create a senior municipal-provincial-federal Great Lakes Table, with Mayors and Ministers meeting at least once a year, to report on progress, discuss ideas and move forward collaboratively on Great Lakes protection.

What municipalities are experiencing

Previously, the COA has focused solely on federal and provincial programs, and has not addressed the impacts and interests of municipalities in Great Lakes water quality. As argued by the City of Toronto,

> Municipalities, particularly coastal municipalities, are ultimately responsible for many of the actions and activities directed at improving or protecting the ecosystem health of local watersheds, along their waterfronts and ultimately the Basin. As the initiator and implementer of many of the requisite actions, municipalities should be given a significant role in the Agreement for setting priorities, developing workplans with practical timelines, identifying funding and cost sharing requirements, and evaluating success of progress made. (City of Toronto, Response to EBR Posting PA 07E0001, COA policy proposal).

What needs to be done

Given the important role of municipalities on the Great Lakes, in terms of their enormous financial contribution to their protection and the impact of their operations, as well as the importance of the lakes to municipalities in attracting residents and businesses, and in creating a desirable quality of life, it is essential that municipalities have a seat at the table when Great Lakes programs and funding are being determined. The goal is to increase collaboration and promote innovation on Great Lakes policies, programs and projects among the three levels of government.

Over the past six months the Province has demonstrated a real interest in discussing ideas and increasing collaboration with municipalities. Municipalities would like to thank the Province for all their hard work and interesting ideas in the meetings. We wish to build on and continue this spirit and good will, and move forward into a new phase of exploring the five action plan areas. We see quarterly meetings continuing under the COA MOC to begin active collaboration in the five areas, and to continue to provide strategic advice to provincial ministers as they enter active negotiations over the COA.

In addition, we also see the urgent need to create a new Great Lakes Table that involves senior representatives from all three levels of government. We wish to explore with the Federal Government their interest in joining the dialogue with the municipal and provincial governments and in engaging in collaborative approaches to protect the nearshore.

Thirdly, since 1972, the COA is the mechanism used by Canada to meet its obligations under the Canada-U.S. Great Lakes Water Quality Agreement (GLWQA), which defines common goals and results to be achieved at the bi-national level. Given the increased interest in the Great Lakes by the new US administration, and the age of the current Agreement, there may be opportunities for the two federal governments to open the GLWQA for renegotiation in 2009-2010.

If the Great Lakes Water Quality Agreement is opened for negotiation, then the United States and Canadian federal governments need to establish a mechanism which provides the same level of dialogue with mayors to discuss issues affecting municipalities.

ACTION 2: Improve and Promote Beaches, Natural Areas, Waterfronts, Trails and Tourism

2.1: Develop a joint beaches strategy, with a target date of 2015 to have Ontario beaches open a minimum of 80% of the swimming season.

2.1.1: The joint beaches strategy would include, but not be limited to:

- measures to improve beach management, assessments, and exchange of best practices, with funding support
- improved beach monitoring and monitoring methods, including predictive modelling and real time beach quality indicators; increased monitoring frequency; increasing the number of Great Lakes beaches monitored and revised monitoring and posting criteria
- measures to increase people's use and appreciation of beaches, e.g. through a beach certification program such as the Blue Flag program; and better public information on beach quality
- research on improving our understanding of rates of illness associated with beach use

2.1.2: Create a Beach Office within the provincial government to lead development of the beaches strategy, in conjunction with a new Beaches Panel of provincial, federal and municipal governments and other interested groups.

2.2: Work with the provincial government to increase the support and funding for natural areas, waterfronts, trails and tourism along the Great Lakes, including the implementation of biodiversity and natural heritage plans and promotion of volunteer activity for local shoreline clean-up activities.

2.3: Work with municipal, provincial, federal governments and others to develop methods to foster people's awareness, connection and enjoyment of the Great Lakes, including a marketing and tourism program geared to identifying the Great Lakes as a national treasure.

What municipalities are experiencing

Beaches

Nothing resonates more with the public than open beaches and clean water to shape their perception of the health of the Great Lakes. Ontario is blessed with many exceptional beaches located within their communities, from Pancake Bay in Lake Superior, Wasaga Beach on Georgian Bay, to Sandbanks in Lake Ontario. These miles of sand and clean water attract thousands of

residents and visitors each summer for a welcome day of fun, exercise and activity. For some communities, these beaches help to define their community spirit. They are also central to the vitality of their tourism industry and are the lifeblood of their local businesses.

To have beaches open and to provide a pleasant experience for people, a municipality has to be doing many different things well: have good, clean beach facilities such as change rooms and washrooms, public beach access, effective litter control program, dedicated parks program with signage, picnic tables, and beach grooming, strong environmental program with innovative stormwater controls, wastewater program to manage sewage, comprehensive watershed planning to minimise sediments and nutrients, progressive lot controls to increase infiltration, and regular beach monitoring, communication and promotion.

Clean and safe beaches really are the integrator of many environmental efforts including efforts to reduce excessive nutrients (outlined in action area 3) and efforts to reduce untreated sewage and stormwater entering the lakes, rivers and streams (outlined in action area 4).

Having beaches open for swimming for the maximum number of days possible is important for the local economy. Each day a beach is not open has a direct impact on tourism-dependent businesses. Many municipalities own or operate local beaches, so they have a large interest in managing better beaches to ensure they are open throughout the summer season. And with population growth and longer warmer seasons due to climate change, there is growing pressure to open beaches earlier and earlier in the spring and close them later and later in the fall. This has direct resource implications for municipalities who own beaches.

Municipalities with experience in managing beaches are aware of the importance of investing in the monitoring, assessment and reduction of the sources of contamination to the beaches, improving monitoring methods and increasing the frequency of sampling. Collaboration on new methods of beach management has helped a number of municipalities, but more information sharing is needed. Municipalities also need stable, consistent funding for developing and implementing beach management plans.

And despite huge public support for clean healthy beaches, the importance of beaches to the community is not reflected in the governance, leadership, management, or funding of beaches. Efforts to manage beaches are frustrated by a tangle of unclear roles and responsibilities. This has resulted in a patchwork of beaches management, no clear overview or focus on improving the state of Ontario's beaches, and very uneven beach quality across the province.

Wetlands & Natural Areas

Municipalities recognise that protection of the Great Lakes does not stop at the lake shoreline. Tributaries and wetlands must also be protected to have a healthy nearshore zone. Many municipalities struggle to preserve wetlands and natural areas in the face of growing urbanisation, difficulty in quantifying benefits, difficulty in evaluating wetlands, gaps in wetland mapping and conflicts with other land uses.

Often municipalities partner with Conservation Authorities on watershed planning, which highlights the linkages between healthy streams and healthy lakes. In addition to direct work to restore watersheds and rehabilitate streams, watershed management plans are a

useful tool for municipal site planning and in integrating watershed protection considerations into infrastructure planning and implementation.

For example, stream degradation leads directly to increased erosion and sediment deposition at the mouth of the tributaries. Upstream development and increases in the amount of impervious surfaces (allowing less infiltration into the ground) often forces more water into the creeks, streams and rivers and thus the Great Lakes. Along the path, this increased run-off picks up pollutants such as sediment, oil, sand, grit, metals, pesticides and fertilizers.

Municipalities know that ecosystem planning and implementation contributes to improving water quality at the Great Lakes shoreline. Municipalities support further strengthening in COA of the recognition that the health of the watersheds that are upstream of the Great Lakes directly impact the quality of Great Lakes water and ecosystem.

Trails & Tours

Municipalities have been active in creating trails, especially around waterfront areas. Many municipalities are interested in working together to further expand tours and trails around the Great Lakes as a way to reconnect people to the Lakes, create community spirit and support local businesses. With the current economy in a downturn, 'stay-cations' will be more appealing, meaning that families may vacation closer to home. This presents an opportunity for Great Lakes enjoyment and experiences for Basin residents. Some municipalities are already working on waterfront and harbour restoration projects. Municipalities have an interest in also working together with the Ministry of Tourism and others to capitalise on and further enhance the growing Great Lakes cruising industry.

Tourism and Marketing the Great Lakes as a National Treasure

Municipalities are interested in exploring the benefits of a large cooperative campaign to increase Great Lakes awareness and appreciation communications, and promote shoreline activities. Municipalities often do not have ready access to the key focus tested messages, polling results, facts and/or photos needed to make the link between municipal programs and the Great Lakes. There is much to learn from a number of excellent campaigns used to draw attention, increase awareness, and change attitudes and behaviours around a particular issue. Communications campaigns, and the cost of assembling background material and research, can be expensive so there is a need to ensure it has a strong potential to result in measurable benefits to environment, health and tourism.

The challenge for a broad communications strategy is that there are multiple issues around the Great Lakes which require multiple behaviour and other changes. A communications campaign should be long term and based on a solid understanding using a step-by-

step approach, so the program is not overwhelmed by the multiplicity of issues and barriers. Alternatively, a communications campaign could focus on one issue, i.e. phosphorus management or water conservation, and build a framework for broader issues.

Municipalities are interested in having the Province lead a communication strategy on targeted Great Lakes areas such as water conservation, beaches, and source water protection. Part of this strategy could be common branding/logos/messages that a municipality and others could also use to support this effort at the local level.

Municipalities also need a short series of factoids, quotable quotes and stock pictures on Great Lakes and focus group tested messages that they could use when communicating about water or environmental issues in their community.

What needs to be done

Creating a Joint Beaches Strategy to Improve Beach Openings, Coordination and Funding

People's perception of the state of the environment, the Great Lakes or a community is often strongly influenced by their experiences at a beach. For this reason, beaches are often used as an indicator of water quality and often environmental quality. A beach that is not open for use during the summer can leave people with a negative impression of the lakes as a whole. Beaches are one of "impairments of beneficial uses" used in COA to evaluate areas in the Great Lakes.

According to State of the Lakes Ecosystem Conference (SOLEC), the overall assessment of Great Lakes beaches is mixed and unchanging. Lake Erie and Lake Ontario beach conditions are considered poor and deteriorating, with 32% of Lake Erie beaches and 26% of Lake Ontario beaches open more than 95% of the beach season from 2006-2007. Lake Huron and Lake Superior beach conditions were seen as fair or good and improving with 67% of Lake Huron beaches and 79% of Lake Superior beaches open more than 95% of the time in 2006-2007 (SOLEC 2009).

Blue Flag, an international beaches accreditation program, requires that a Blue Flag designated beach be healthy for human activity at least 80 per cent of the time. In association with an environmental nongovernmental organization called Environmental Defence, Blue Flag has accredited 12 beaches and 5 candidate beaches in Ontario as of 2008.

The Great Lakes Mayors are advocating for a target date of 2015 to have Ontario beaches open a minimum of 80% of the swimming season, and a joint strategy to get us there. This would serve as an interim target towards an ultimate goal of having beaches open 100% of the swimming season.

The joint beach strategy, a collaborative plan to improve beaches management and promote beaches to the public, would include:

- measures to improve beach management, assessments, and exchange of best practices, with funding support
- improved beach monitoring and monitoring methods, including predictive modelling and real time beach quality indicators; increased monitoring frequency; increasing the number of Great Lakes beaches monitored and revised monitoring and posting criteria, with funding support
- measures to increase people's use and appreciation of beaches, e.g. through a beach certification program such as the Blue Flag program; and better public information on beach quality
- research on improving our understanding of rates of illness associated with beach use

Achieving a target of 80% beach openings across Ontario by 2015 is an ambitious, but achievable goal. However, it will take government leadership, sharing of best practices, and funding to reduce pollution sources to get there.

Leadership on beaches is needed at the federal, provincial and municipal level. There is a mismatch between the importance of beaches to the community and the institutional arrangements and funding to deliver better beaches. There is often confusion over the roles and responsibilities of various provincial and local agencies involved in beaches. This often results in no one agency having a clear mandate to improve beaches. Even within a Ministry or municipality, it may not be clear who has primary responsibility for beaches. The scattered responsibilities have meant that beaches are often a low priority in many agencies.

That is why the Great Lakes Mayors are calling for the creation of a Beach Office to lead the development of the joint beaches strategy. A Beach Office would have a mandate to be the focal point for new provincial policies and actions to improve beaches: support efforts to identify; reduce and eliminate pollution sources; develop mechanisms to fund beaches management; coordinate efforts to improve monitoring methods including predictive modelling and real time water quality indicators, and coordinate collaboration amongst the various agencies and groups with an interest in beaches management. This Beach Office is necessary to establish clear provincial interest in improving beaches and to provide a much needed focus for new beach activities.

To kick start development of a beaches strategy, it would be beneficial to have a wide range of innovative and creative ideas. We suggest a Beach Panel, with membership drawn from provincial, federal and municipal governments, business, tourism, First Nations and environmental and other groups. This group would be charged with developing recommendations on a joint beaches strategy.

Improving Beach Management and Funding

Municipalities and relevant provincial and federal agencies need to work together to improve beach management. Surveys tell us that people's enjoyment of a beach is based on more than just clean water quality. The quality of change rooms, bathrooms, recreational facilities, litter control, algal control, parking or public transit access, quality of the sand, and availability of shade all factor into "a good day at the beach". Our new efforts on beaches need to be based on improving people's enjoyment at the beach while recognising that beaches are ecosystems, providing essential habitat to many birds, fish and plants.

Some municipalities have forged ahead with detailed beach programs and plans. Sharing their beach management methods and experiences would assist other municipalities and public health units with their programs and could help inform provincial policy. This could include best practices on beach management related to nuisance alga, invasive species, litter control, gull and geese control, dog control, litter, and funding for beach facilities.

Municipalities are interested in working with others to undertake comprehensive assessments of the sources of beach contamination to use as a basis for action. It is often difficult to know which source contributes to the bacterial contamination of a beach, and what the most effective measures are to prevent beach postings. Beach surveys can be important tools to help identify contamination sources and remedial actions. Municipalities seek assistance with developing and undertaking such beach surveys.

As part of this effort, we need to establish a beach funding program for the development and implementation of monitoring and source control programs. It is currently difficult for many municipalities to find funding to support better beach management. There are no sources of stable, year to year municipal beach funding, as exist in the United States. In the US, the Federal Government

through the BEACH act provides annual funds for agencies to improve beach monitoring and reporting activities. There may be opportunities to learn from other systems to identify a range of beach funding mechanisms. The lack of stable, consistent, federal, provincial, and municipal beach funding is a significant barrier to progress on beaches.

Improving Beach Monitoring

Many of our current methods to assess beach water quality could be improved. There is room for progress in defining: which indicator we use, which method we use, how often we monitor, how we monitor, how we decide to post a beach, how we use monitoring results to identify sources of contamination, how we report monitoring results, and how we analyse and learn from monitoring results.

A number of municipalities would like to explore with the province, federal government and others, new methods of beach monitoring including real time water quality indicators and predictive modelling. Real time indicators have the advantage of shortening the lag time between sampling, analysing and responding. Predictive modelling uses information about the beach and the current weather to predict bacterial contamination on the beach. Beaches in the United States are gaining experience with predictive modeling. It is timely to start a pilot project in Ontario on predictive modelling.

While some municipalities and public health units have beach monitoring in place, many beaches remain unmonitored. Where monitoring does occur, different methods to sample, analyse and post beaches are applied. There is variation with respect to the frequency of monitoring, the methods used to sample at beaches, and the time lag between taking the sample and reporting the results publicly.

Given this variability, it is difficult to get an overview of the state of Ontario's beaches, due to different reporting systems, protocols and standards. This makes it difficult to assess current situations, identify trends and identify local needs.

A concentrated effort is needed to achieve more consistency in beach standards, indicator species, sampling methods, posting and unposting procedures, and improved communication and coordination. This would help Ontario make publicly available a database of beaches and beach management results.

There is also concern that the standards and protocols from the Ontario Ministry of Health and Long Term Care used to determine if a beach is open for swimming need to be further reviewed and strengthened. The Beach Management Protocol requires municipalities or public health units to sample the beach once per week. Many municipalities and other groups feel that this was too weak a standard. Decisions on public safety are being made using results that are at best one day old and as much as one week old. Beach conditions can change hourly, daily and weekly depending on the weather conditions. In addition, municipalities are interested in working with the province, federal government and others to understand better the rates of illness from different beach experiences.

Municipalities see a need to sample beaches more frequently than once per week, under strict criteria with good quality assurance. Some suggested that we should be striving to sample beaches a minimum of four times

a week. However, for many municipalities and public health offices, finding the funding for more frequent sampling would be a challenge.

For municipalities that are close to the United States border, it is confusing for the public to have an Ontario beach not open for swimming, but a nearby United States beach with a similar level of bacterial contamination open for swimming. (The MOE standard is 100 E.Coli colony forming units (cfu) per 100 mL, based on the geometric mean of a minimum of one sample per week from at least 5 sampling sites per beach. US EPA standard is a single maximum value of 235 cfu per 100mL, and the State of Michigan uses 300 cfu per 100 mL).

Some municipalities would like to see consistency in beach standards between the United States and Canada. If both countries used the same approach, it would be much easier to compare beach quality across the lakes. It is recognised however, that harmonising beach standards may not be easy, as each jurisdiction is committed to its own system.

Improving Beach Communication and Promotion

Beaches are vital to community spirit, tourism, economic development, healthy lifestyles and fostering people's connection to the Lakes. Local and provincial tourist websites and materials could be better linked to promote the value of beaches. In addition, the Ministry of Tourism and Ministry of Health Promotion may wish to consider new efforts to encourage local and visitor beach use, perhaps through the creation of a provincial beach campaign, e.g. a "Jump In" program.

Municipalities, conservation authorities, and relevant provincial and federal agencies need to work together to improve beach certification and communication. Often the public does not know where to go for information about whether a beach is open or not. It would be invaluable in promoting healthy beaches to have a one-window provincial beach hub or portal with links to local beach information. Sharing communication efforts on posting signs, brochures and beach information would also be helpful.

Responding to the New Challenges of Climate Change on Beaches

Municipalities also recognise that climate change poses new challenges for beaches: by increasing the number of people using beaches, by extending the time that beaches are used for swimming, and also by increasing the possibility of greater contamination (through increased water temperatures, increased severity of weather, and especially increased "flashiness" of stormwater that may increase sewage bypasses and combined sewer overflows). This highlights the interconnection between shoreline protection activities, climate change mitigation and adaptation activities, and public connection to beaches and the nearshore zone.

Supporting Natural Areas & Wetlands

When trying to protect a wetland, municipalities often do not have enough information on the significance of the wetland because the wetland evaluation is not complete, to a sufficiently detailed level, or mapping is not complete. Municipalities would like to support additional efforts to develop and update provincial and local mapping of provincially significant and other wetland areas. These maps are vital for municipal planning decisions to protect wetlands and natural areas. Municipal, provincial and federal governments, Conservation Authorities and others need to fund and coordinate: i) collaborative work under the newly developing Great Lakes Biodiversity Strategy and Natural Heritage System plans; ii) evaluate all provincially significant areas and wetlands by 2012; and iii) further develop a suite of best management practices for land stewardship.

Land stewardship is vital to assisting rural property owners and the agricultural industry in the goal of a healthy ecosystem. Municipalities and Conservation Authorities are leading the way in these initiatives. Best management practices documentation available to all would assist municipalities and conservation authorities in strengthening the ecosystem.

Municipalities are also interested in finding ways to further promote and fund new and existing community stewardship and cleanup activities.

Supporting Waterfronts, Trails & Tourism

In some areas, excellent trails (walking/biking/skiing) and routes (driving tours) already exist, forming a good building block for linking these tourism activities to the Great Lakes. It is important to build on existing efforts, rather than duplicating efforts. These trials and tours will help promote an awareness of beaches, wetlands, natural heritage, sustainable agriculture, green infrastructure, and vital waterfronts.

Waterfront Trail

Ontario's Waterfront Trail is a collaborative endeavour that connects Lake Erie to the St. Lawrence River, running along the shore of Lake Ontario. Its 680 km of trails tie historic downtown communities with waterfront festivals, attractions, views, parks and natural areas as well as cultural and heritage attractions and events. Fully developed, there is potential for the trail to grow to 900 km with improvements providing more direct access to the water.

Municipalities are also interested in collaborating with the Province on opportunities to capitalize on and enhance the growing boat cruising industry. While its full potential has not been reached, Great Lakes cruising is a high value niche product that is increasing in demand. This industry has the potential to generate tourism interests in and around the lakes, attracting both domestic and global visitors.

There are opportunities to work together to further brand and identify the Great Lakes in provincial and municipal tourism advertising. The Great Lakes should be promoted as a desirable destination similar to other regions, including the Grand Canyon and the Rockies.

Municipalities have an interest in partnering to develop a marketing campaign that brands the Great Lakes as a national treasure. This could involve working together to define a successful campaign, through collaborative polling, sharing experiences, and communicating needs.

Municipalities, the provincial and federal governments could start developing a Great Lakes promotion or conservation campaign by first pulling together the lessons, costs, benefits and methods from other public communications campaigns, and then considering how these could be applied to the Great Lakes context.

Promotion of Niagara Region through the Niagara 10

Niagara Region, together with key partners in upstate New York, established the Niagara 10, which involved local county and municipal governments in upstate New York, and local governments within the Region.

The Niagara 10 endorsed fifteen actions to establish priorities, coordinate actions, partner on infrastructure solutions, and recognize the uniqueness of the Niagara River as a shared waterway between two nations and their partner municipalities. These actions included matters specific to Great Lakes appreciation, such as:

- State of Our River Bi-Annual Meeting Report
- Regional Tourism Promotion
- Bi-National Significance/Events Commemoration
- Heritage Promotion
- Sports and Recreation Tournament Promotion

Currently, many municipalities do not communicate messages using a Great Lakes context. To improve the sense of living in the Great Lakes basin, many municipal messages could have a Great Lakes theme. To help this process, municipalities would find it helpful to have access to Great Lakes communications materials. This could contain focus tested messages, materials, photos, factoids and focus test results.

Municipalities have a large number of distribution channels. It may also be helpful for communications staff at municipal, provincial and federal levels to work together to develop materials, coordinate on polling and share their distribution networks. New opportunities presented by social networking websites, blogs, iPod broadcasts, etc. could also be explored to further promote and develop a Great Lakes community. It would be important to learn from and support existing communications efforts such as the Great Lakes Information Network.

ACTION 3: Attack Nuisance and Toxic Algae

3.1: Work with municipal, provincial, federal government and other parties, undertake a comprehensive algae control plan to reduce phosphorus concentrations in the nearshore and tributaries to a level that prevents nuisance growth of alga.

3.1.1: The algal control plan would:

- Identify areas seriously affected by algae.
- Where necessary, undertake research to establish the sources, amounts and loadings of nutrients to the watershed and nearshore in these areas.
- Develop lakewide and local nutrient control plans.
- Based on conclusions, implement control measures which give the greatest nearshore improvements.

3.1.2: Encourage the provincial government and others to increase research into algae growth and control measures, including:

- Increasing the translation of current science into practical control measures.
- Sharing and application of lessons learnt from existing research partnerships to other areas of the Lakes.
- Supporting the development and implementation of innovative non-point source control measures.
- Supporting and participating in new provincial and federal research to develop further Predictive Frameworks for Management of Cladophora Biomass and blue green toxic algae.

What municipalities are experiencing

Municipal representatives voiced serious concern over the proliferation of algal growth, and expect it to worsen with rising water temperatures and increased storminess from climate change. These changing lake conditions have led to huge four foot algal pile ups on the beach (locally known as "elephant snot").

There is growing public frustration with the increasing amounts of alga, and this is creating pressure for quick solutions. Many municipalities are receiving a large number of public complaints about beach and waterfront fouling, the bad smell, and unsightly appearance of mounds of alga at the waterfront. In most areas of the lower Lakes, alga is a huge and growing problem, but it is less so in the Lake Superior region.

The algal problem from the municipal perspective has several aspects. Firstly, filamentous algae is considered an unpleasant aesthetic nuisance by residents and visitors, resulting in odour complaints, drinking water and sewage pipe clogging, increased beach management, and damaged waterfront vitality. It can also become a breeding ground for bacteria. These effects have a direct impact on people's enjoyment of the shoreline, can cause clogging and other impacts which increase costs, and can severely impact shoreline property values. Secondly, blue green and other alga are associated with drinking water concerns, both in terms of taste and odour and in some cases in the production of toxins. Some municipalities are experiencing profound impacts from blue green alga levels including drinking water bans, large investments in drinking water filtration, toxicity to animals and wildlife, and large property value decreases.

Local Concerns over Algae

St. Catharines has seen the presence of algae along its beaches vary in recent years. In 2006, significant algal growth along Lake Ontario was found to be contributing to avian botulism. Birds in the impacted areas were eating the algae, and some unfortunately became sick. This had a large impact on the public's perception of the shoreline's safety.

In 2007, the City of St. Catharines also received a large number of complaints about algal deposits along the Lake's shoreline and worked hard to remove tonnes of decaying algae from its beaches. Odour and poor taste were the major concerns noted. Caused by tiny concentrations of Geosmin and 2-Methylisoborneol produced by blue-green algae and/or bacteria called actinomycetes, residents could smell the algae from kilometres way and clothes often still had a lingering odour after being near the beaches. Although safe to drink, with no human health effects, the musty odour in the drinking water was a concern the municipality took very seriously.

In contrast, algal growth was not a significant issue in 2008, likely due to cooler temperatures and more storm events than in 2007. Unfortunately the very conditions that create perfect days at the beach with blue skies, hot sun and calm, warm waters are also the perfect conditions for the growth of algae.

While there are many pollution sources contributing to the growth of algae along the Lake Ontario shoreline, the City of St. Catharines and broader region have spent millions of dollars eliminating combined storm and sanitation sewers, upgrading plants, and installing large tanks to catch overflows. Drinking water is sampled on a daily basis all year long throughout the City. St. Catharines also continues to work in partnership with the Niagara Regional Public Health Department to sample its three beaches daily in the summer to ensure they are safe for swimming. Beach postings have been reduced significantly from 2004 to 2007. Unfortunately, many researchers and beach managers across the Great Lakes expect the algae issues along the shorelines to present management challenges on a scale greater than that seen in the past.

Million dollar Investment to Reduce Algal Taste and Odour

In some communities on the shores of Lake Ontario, around the end of the summer, people often complained that their drinking water tasted and smelt "funny". Turns out it was the result of certain species of alga which tend to bloom in large amounts at the end of the summer. The City of Toronto, in response to public complaints, installed new technology (granulated carbon filters) at its four drinking water plants to help minimise taste and odour. The cost of algae? Over $6 million dollars for installation alone!

Recent research suggests that the causes of rapid algal growth are quite complex. Controlling phosphorus concentrations has traditionally been viewed as the major method of controlling alga growth. Now, the introduction of zebra and quagga mussels has increased water clarity, thereby allowing light to penetrate to deeper water. This has greatly expanded the available area for algae to grow (some estimates note increases of algal growth in the zone by 6 meters). In addition, some research indicates that mussels may be providing a direct source of phosphorus to algae by excreting large amounts of phosphorus from filtered plankton and other sources. Algal growth is therefore now a combination of controlling nutrient levels and recognising the increased zone available for algal growth. As noted above, the rapid changeability of algal growth can also be aggravated by changes in the weather and water temperatures, which are expected to become more extreme with climate change. There are also still lingering questions about the nature of phosphorus uptake by algae. For instance, algal concentrations may be more relevant than overall loadings. Alga can store phosphorus over time, and the details of phosphorus uptake mechanisms are not always well understood.

Some progress has been made to manage algal growth. Many municipalities, often with provincial or federal input, already have experimented with algal control which could be useful to explore and share further.

What needs to be done

From the municipal perspective, it is evident that there are no quick and easy solutions to the algal growth problem. Much of the degradation is related to non-point sources from urban and agricultural run-off and point sources. It is further aggravated by invasive species such as zebra and quagga mussels that filter the water, allowing for greater penetration of sunlight into the water column. Making sewage treatment more effective at capturing nutrients, separating storm and sewage systems, building large retention tanks, and extending outtake pipes deep into the lakes are important but costly ventures that take years to plan, finance and implement.

As a consequence, municipalities advocate for an integrated approach to carefully quantify all sources of nutrients in a watershed and then prioritize actions based on those that give "the biggest environmental improvement for the buck". Municipalities are interested in working together to develop a nutrient management plan for each Lake and also for local areas. Sharing of best management processes and experiences is also considered important.

For instance, pollution control and pollution prevention measures are much more economically efficient approaches and have the effect of removing nutrients from both non-point run off and sewage and stormwater discharges. Municipalities recognise that it is time to "move up the pipe" to reduce the volume, nutrients and contaminants in stormwater and sewage.

Due to the complex cause and effect linkages associated with algal growth, municipalities emphasize the need to strengthen the linkage between science, policy and remedial action.

Identifying Areas Affected by Algae

The reduction of phosphorus concentrations must be based on a better understanding of the relationship between nutrient loading and algal growth in the nearshore zone. In association with federal and provincial agencies, municipalities need to determine the loading levels and concentrations regimes required to reduce and prevent nuisance levels of algae growth. In addition, an integrated approach to increase understanding of point and non-point sources of nutrients to the nearshore is needed. This could be accomplished though the development of an algal control or nutrient management plan for each Lake.

The provincial and federal government could assist by increasing the monitoring of the nearshore zone, increasing the tracking of the severity of algal fouling, increasing data analysis and improving the links between scientific results and policy. In particular, municipalities supported an enhanced role for the Ministry of Environment in collecting, analysing and communicating information about the state of the nearshore and working together to define practical solutions. All three levels of government could increase partnership activities in these nearshore efforts.

Establishing Sources and Amounts of Nutrients

Part of the challenge in improving the nearshore is that we do not have a common shared understanding of the "big picture", that is, the relative role and importance of multiple nutrient sources, and how these factors work together. Municipalities often do not have sufficient funding to begin these assessment studies. When municipal staff seek funding, the following questions are raised: "How do we know that this investment is tackling the largest source of the problem? What degree of improvement will we get for this investment? What reduction in algae or improvement on the beaches will this give? Is this the most cost effective plan?" Often these questions are hard to answer because the relative roles of sources and the interaction of factors are not always well known. Municipalities, provincial and federal governments need to come up with a good solid plan, establish partnerships, and decide on priorities.

The United States Environmental Protection Agency provides federal funding for many assessment reports to answer the above questions. It is recommended that federal and provincial funding be made available to municipalities and other stakeholders under the COA to undertake such assessments. Joint collaborative research should also be funded.

Implementing Control Measures

As a final step in the comprehensive control plan, control measures must be introduced. These control measures would be designed based on the assessment of sources described above. Depending on the sources of nutrients being controlled, these measures could range from mandatory measures introduced at the federal, provincial or municipal level, or voluntary measures, through extension programs to households or the agricultural community.

Even before the assessment of sources is completed, there are a number of no-regrets actions that should be undertaken. The Federal Government has proposed a

new limit on phosphorus in specific products such as household laundry soaps, household dishwasher detergent and household cleaners. This is a positive development which will bring Canada in line with many other Great Lakes states and some provinces such as Quebec and Manitoba. However, there is the opportunity to further limit phosphorus used in products in other sectors such as industrial/laundry soaps and industrial/institutional dishwasher detergent, as well as for many other products that contain phosphorus such as fertilisers.

It is recommended that the provincial government call on the Federal Government to extend the proposed phosphorus limits on household dishwasher detergent, laundry soap and cleaners to other sectors such as commercial and industrial and to develop additional phosphorus limits in other consumer products.

Many industries also use and emit large amounts of phosphorus and nitrogen. It is timely to begin to evaluate how best to achieve reductions in phosphorus and nitrogen releases from industrial sources.

Learning from Existing Research Partnerships

Many municipalities have been involved in efforts to reduce alga. For example, Halton Region's Lake Ontario Shoreline Algal Action Advisory Committee developed a number of recommendations for the region (see box below). A number of municipalities stretching from Prince Edward County to the Western end of Lake Ontario have been involved with the Lake Ontario Collaborative effort (see www.owwrc.com). Also groups such as the Greenbelt Foundation provide funding to assist farmers in implementing best management plans which can help reduce nutrient loading. There may also be lessons to learn from the draft Lake Simcoe Protection Plan, which sets lakewide phosphorus load targets, phosphorus concentration targets for the lake (0.01 mg/l in the spring), nearshore (0.02mg/l) and tributaries (0.03mg/l), and also dissolved oxygen limits.

These models have much to tell us about how to move forward in a move coordinated and collaborative manner. It is recommended that there be further discussion of these models and application of lessons to other areas of the lakes.

In addition, some municipalities were interested in collaboration on a better notification system through an alert mechanism when a taste or odour problem or a toxic bloom has occurred.

The Ministry of Environment may want to consider convening a forum with current researchers and policy experts to explore how science and research on algal growth may be effectively translated into policy and action.

Community Volunteers Join with Region of Halton to Fight Algae

Halton Region is one of many communities along Lake Ontario that are affected each summer by attached algae (Cladophora) that accumulates in the nearshore and gives off noxious odours. The rotting algae have a significant adverse impact on quality of life and enjoyment of the lake. Several of Halton's beaches have been closed in recent years due to excessive algal growth. Although the economic impacts are difficult to quantify, rotting algae negatively impacts local businesses and lakefront events.

In 2002, Halton Region created the Lake Ontario Shoreline Algae Action Advisory Committee (LOSAAAC), a volunteer group of concerned residents who worked with Regional and Local Councillors, municipal staff and experts to gather information and research solutions.

LOSAAAC focused its efforts in three areas: 1) physical clean-up of algae, 2) funding and monitoring of research, and 3) public education.

Unfortunately, most of Halton's shoreline is comprised of rocky beaches, which makes it difficult to remove washed up algae effectively. A pilot clean-up project carried out by the Town of Oakville was very costly, with minimal impact on overall algae accumulation, so physical clean-up is no longer being pursued.

Funded through the Ontario Water Works Research Consortium (OWWRC), an Attached Algae Research Project was completed by the National Water Research Institute and the University of Waterloo in 2007. LOSAAAC volunteers also participated in a multi-year water quality study in partnership with Conservation Halton. In addition, a comprehensive public education program called "Give Our Lake a Break" was developed to raise awareness of source control measures, and "Lake Health Tips" brochures, buttons and tattoos have been distributed at community events.

LOSAAAC produced their final report of recommendations, which led to an implementation plan in May 2008. The plan calls for the promotion of a science-based, lakewide approach to phosphorus management in Lake Ontario (see www.halton.ca/PPW/water/LakeOntario/LOSAAAC.htm).

Further Developing a Predictive Framework

Municipalities recommend the establishment of a nearshore science-based algal framework and plan, which would facilitate collaborative research among federal, provincial and municipal officials involved in sampling, monitoring, and predictive modelling. For example, some municipalities have developed ways to share sampling, where municipal staff on location take the sample, and the Province provides transportation, analysis, and communication of the results. Municipalities felt that more opportunities to work together on sampling and monitoring would result if there was a commonly shared framework to carry out this work.

Municipalities are also interested in the ability to understand the nature of the algal problem and to predict the effects of proposed controls on algal growth. Predictive modelling has not been updated since the 1980s, prior to the proliferation of zebra mussels. Since then, the ecology of the lakes has dramatically changed. Further work on a new model of Cladophora growth that fits the new ecology of the Lakes is needed. This would allow quantification of the amount of phosphorus reduction needed to achieve the desired reduction in algal growth (i.e. if reduce soluble reactive P by X amount, then can expect to reduce Cladophora biomass by Y amount). This quantification approach would also be helpful for blue green algae blooms.

Estimating the Costs of Algae

There are few estimates of the costs of algae problems. Direct algal costs include beach and waterfront cleanup, declogging of water intakes, disruption of cooling water in nuclear plants and industry, and the installation of specialised equipment to reduce taste and odour at drinking water plants. Indirect costs, which are a challenge to identify but are nevertheless significant, include the loss of tourism, the impact on the recreational and commercial fishing industry, shrinking shoreline property values, and the negative public perception of areas affected by algae. Together these costs add up to many millions of dollars each year.

A comprehensive assessment of algal costs is needed to help justify investment in programs that control algae. A joint effort is needed by the federal government, the provincial government and municipalities to immediately work together to quantify the costs of algae. Municipalities would bring considerable knowledge and information to the table in estimating costs, as they are covering many of these costs currently, and have a sense of the local impacts on businesses and residents. This can be a component of the broader Business Case (action area 5).

Million Dollar Price Tag for Clogging Algae

Algae regularly clog the screens on the cooling water intake pipes for many industrial and electrical generating plants in Lake Ontario. In fact, Ontario Power Generation recently reported that in 2005, the algae clogs were so bad, it caused a reduction in power generation and so a loss of revenue- to the tune of $6 million dollars. From 2000 to 2005 in fact, alga has been an expensive burden-costing Ontario power Generation over $20 million in electrical generation losses.

Township Leads Call for Action on Blue Green Algae

Sturgeon Bay is a relatively large embayment off Georgian Bay approximately 35 km north of Parry Sound. The small village of Pointe au Baril is located at the south end of Sturgeon Bay. The area hosts seasonal cottagers who use their properties for two to three months of the year. As well, Sturgeon Bay Provincial Park, located in the northern basin of Sturgeon Bay welcomes 15,000 visitors per year.

Sturgeon Bay has experienced poor water quality and problematic algae blooms, in particular blue green algae (cyanobacteria) since 2000. These blooms tend to occur in early August, and often continue until late October, when the phosphorus rich waters of the bottom layer mix with the surface waters. One of the consequences of these blooms is that residents of Sturgeon Bay have lost their ability to enjoy their own waterfront. Citizens are also concerned that the long term effects of blue green algae will have a detrimental effect on their health and property values.

The Township of The Archipelago has undertaken a number of activities to address the algal problem such as: supporting a series of studies to understand and track the issue; undertaking septic system pollution analysis; creating a Sturgeon Bay Plan and a Pointe au Baril Strategic Plan; establishing a Sturgeon Bay Water Quality Action Group to coordinate monitoring and research; inspecting septic systems; and meeting with government officials to discuss the issue. Next steps involve exploring the possibility of developing and implementing a pilot project to test new phosphorus control methods.

In addition, the Township is an environmentally focused municipality with restrictive planning policies and regulations. Sturgeon Bay has had a ‘no new lot creation’ policy and the municipality regularly promotes stewardship activities. Since 2003, the municipality has spent an estimated $250,000 on projects, meetings, monitoring, and reports.

ACTION 4: Reduce Untreated Sewage and Stormwater Discharges Entering the Great Lakes, Especially in Light of Climate Change and Technical Innovations

4.1: Call on the federal and provincial governments to assist and encourage municipalities, through policy guidance and technical and financial support, to develop and update their pollution control and prevention plans or other planning methods to reduce sewage discharges.

4.1.1: Calling on the provincial and federal government to adopt aggressive water conservation measures including: a ban on the sale of water guzzling 13 litre toilets and other inefficient appliances, develop a standardized/"model" water efficiency plan, support the development and implementation of municipal water efficiency plans and a public campaign on water conservation, and other measures in cooperation with municipalities.

4.1.2: Municipalities working with federal and provincial governments on innovative funding options to accelerate projects to address combined sewer overflows.

4.1.3: Accelerating the current Ministry of Environment's wastewater review.

4.1.4: Encouraging the development and funding of new more innovative methods of treating sewage.

4.1.5: Reviewing the need for the provincial or federal government to enhance low interest loans and other mechanisms to owners to replace or upgrade leaking septic systems.

4.2: Call on the federal and provincial governments to assist and encourage municipalities, through policy guidance and financial support, to develop, update and implement their integrated stormwater master plans to adopt a new approach to stormwater management that prioritises reduction and reuse of stormwater over treatment and retention.

4.2.1: Increase provincial and federal support for research, analysis, implementation and post implementation monitoring on new and more innovative methods of stormwater control, which could result in new design standards, and the development of regulatory instruments to help advance the implementation of at source measures, including 10 projects that apply the new approach by 2011.

4.3: Call on the Federal Government and others to review and modify current infrastructure design criteria which no longer reflect the reality of precipitation rates due to climate change. To increase the pace of adaptation to climate change by:

- Municipalities work with federal and provincial governments to collaborate on new tools to design and adapt infrastructure to be climate ready.
- Municipalities work with federal and provincial governments to develop and implement local climate change plans, including improved identification and response to local impacts and translating global scale climate change models to local scale impacts.

What municipalities are experiencing

Stormwater

To deal substantively with water quality in the Great Lakes, we need to deal with non-point sources like stormwater. After a rain or snowmelt, water runs off roads, parking lots and landscapes into storm sewers, and is then piped often directly to streams and rivers. In some municipalities, stormwater is collected and treated in stormwater ponds or large storage tanks and then routed through wastewater treatment plants. Stormwater can contain large amounts of nutrients, oils and grease, contaminants and salt.

The Ontario Government is implementing its Places to Grow Act, and the Greater Golden Horseshoe Growth Plan under the Act. The plan prescribes intensification and greenfield density targets for municipalities in the region. While intensification and higher greenfield density are positive in terms of the efficient use of existing infrastructure, it is anticipated that it could result in more intense wet weather and sewage flows into the central and western end of Lake Ontario unless there is a significant shift in how stormwater is managed.

Municipalities are at different stages in stormwater management. Some municipalities have detailed stormwater master plans, wet weather master flow plans or watershed plans. The province has helped fund the development of some of these plans. Most municipalities have specific stormwater requirements for new development as part of their planning processes, but these vary in detail.

Many municipalities are in growth areas and their stormwater concerns are focussed on reducing and managing flow from new developments. For other municipalities the stormwater challenge is different. It involves the challenge of retrofitting existing built up communities to reduce stormwater flows. So there are two distinct types of stormwater challenges: 1) managing stormwater in newly developing areas, and 2) trying to retrofit stormwater measures into existing built up areas. Many stormwater methods, like ponds have large space requirements which are not always possible in a retrofit situation. Municipalities would like to work together to improve their planning and tools available in retrofit situations. Retrofit situations require significant rebuilding of systems at a significant cost. In these situations, the major overland system is often absent and only the minor system of smaller pipes is available.

The existing provincial guidance document on stormwater quality and quantity has worked well, but municipalities feel it would be timely to update guidance to incorporate newer innovative stormwater treatment processes and climate change. The Province could also play a role in assessing the effectiveness of different stormwater measures and technologies, including post implementation monitoring, and help identify, assess and support new innovative technologies for stormwater. These items need to be considered in the current Ministry of Environment's stormwater review.

Some municipalities are going at it alone on stormwater, however; it should involve provincial and federal collaboration. In the past, the Province has not put a

priority on stormwater management. However climate change has demonstrated that provincial infrastructure is at risk as well from stormwater. Major investments are needed to deal with more frequent and intensive storms. There is a need for increased leadership from all levels of government on stormwater.

Wastewater

Wastewater plants receive sewage, wash water and industrial wastes. During a range of processes, nutrient and contaminant levels are reduced. However, wastewater treatment plants cannot remove all nutrients or contaminants and so these pass though to lakes, rivers and streams.

Combined sewer overflows (CSOs) and bypasses are the release of untreated or partially treated sewage into lakes, rivers and streams. Combined sewer overflows and bypasses often occur when heavy rain and/or snowmelt exceeds the capacity of a combined sewer system or wastewater treatment plant.

In the past, bypasses and CSOs were considered standard engineering practice designed to prevent human health concerns associated with basement flooding or sewage treatment plant washouts. Now, there is increasing public pressure to reduce or eliminate sewage releases to the Lakes given concern over contaminants in the releases. CSOs and bypasses often contain "floatables", high levels of pathogenic microorganisms, suspended solids, oxygen-demanding substances, excessive nutrients, oils and grease, toxic contaminants, and other pollutants. Since the overflow pipes are located close to shore or in tributaries, they pose a greater risk of impacting fish health and habitat, as well as human health, if located close to beaches or recreational areas.

There is a wide variation in municipal experience with bypasses and CSOs. Only some municipalities have combined sewer systems (estimated 107 combined sewer systems in 89 Ontario municipalities). Newer developments are no longer built with these systems. Some municipalities have large number of bypasses, others do not bypass at all. Some municipalities have over 100 combined sewer overflow points, with large amount of data about their CSOs. Some municipalities have rough estimates of the number of CSOs and bypasses; while some know the timing of bypasses but not exact volumes. Bypass and CSO volumes are also difficult to compare year to year because they vary greatly with the amount of rainfall.

In Ontario, wastewater facilities are regulated by individual certificates of approval (Cs of A). Since Cs of A are issued over the years, conditions within each C of A vary considerably, resulting in a very inconsistent patchwork of controls across the province. There is currently no standardized approach to the regulation of wastewater facilities in Ontario. To address this, the Ministry of Environment is conducting a wastewater review, however; this review currently has very long timelines. The Federal Government is developing regulations under the Fisheries Act to regulate wastewater, based on recent Canadian Council of Ministers of the Environment - Canada Wide Strategy for the Management of Municipal Wastewater Effluents. This strategy contains limits on biochemical oxygen demand, suspended solids and phosphorus, and requirements for aquatic toxicity testing, monitoring and reporting. Essentially, the requirements would require all primary sewage treatment facilities to upgrade to secondary treatment. While most Ontario wastewater plants would currently meet many of these guidelines, six primary sewage treatment facilities are still in operation in Ontario and would have to comply with the new federal requirement. Many of these six primary plants are expected to upgrade over the next five years.

Like many jurisdictions, Ontario's wastewater sector has been underfunded and many municipalities are struggling with heavy infrastructure costs. At the same time, particularly in the Greater Golden Horseshoe region, urban growth (both intensification and

greenfield) is increasing the amount of water being consumed and wastewater being discharged, and is increasing the amount of stormwater that needs to be managed. For systems with combined sewage systems, the combination of increased wastewater and stormwater volumes have resulted in bypasses and combined sewage overflows into the Great Lakes.

Reducing bypasses and overflows presents a challenge to municipalities. Part of the challenge is the capacity of a wastewater treatment plant to respond to changing loads, the amount of infiltration into the system and the number of combined sewers. Municipalities know many effective ways to reduce bypasses and CSOs but often lack the financial resources to implement them. Reducing stormwater into the system through improved lot controls, reduced sewer infiltration and stormwater ponds can significantly help. Municipalities are increasingly recognising the connection between stormwater and wastewater ("it is really all water"), working on water balances, and interested in strategies to reduce stormwater as these can be the most cost effective ways to reduce bypasses and CSOs. This is especially important as in the increased intensity and frequency of storms with climate change will also pose new additional challenges to making progress in reducing bypasses and CSOs.

Municipalities are at different stages of planning and implementation of mitigation measures. Some municipalities have detailed plans for reducing bypasses and CSOs, others are just beginning. Some municipalities are more than half way through sewer separation, others are just beginning. For some municipalities with older systems, it is a multi-million dollar, twenty five year program to separate sewers, and reduce bypasses and CSOs.

A number of municipalities also have sewer use by-laws that impose limits on what sewer users may discharge into the municipal sewage system to reduce the input of harmful contaminants.

There is a lot of uncertainty among municipalities about the future of stormwater and wastewater management. Discussions on future directions would help municipalities with long term planning.

Climate Change

Climate change is a new addition to the COA. In the 2007 revision, climate change impacts on the Great Lakes were added as a new area of special focus. The Great Lakes Water Quality Agreement of 1978 and its 1987 Protocol are also silent on climate change. Therefore, municipalities have the potential to work with the provincial and federal governments to augment the existing climate change provisions in COA. If desired, this could lead to a call for the addition of a new annex on climate change to the Great Lakes Water Quality Agreement.

Climate change mitigation and adaptation is likely to become one of the priority challenges facing municipalities. Municipalities are feeling increasing pressure to have a formal climate change action plan or series of informal actions that demonstrate progress towards a formal reduction goal. About 40 municipalities in Ontario are developing these climate change action plans through the Partners for Climate Protection, a joint program of ICLEI and Federation of Canadian Municipalities.

In 2008-2009, a number of cities including Toronto and Thunder Bay announced their climate change action plans. These plans were produced by municipal interdepartmental committees, often with the involvement of industry, academics, and nongovernmental groups. Each plan is tailored to local situations and yet they contain remarkably similar elements: emission reduction targets, green buildings, energy efficiency, increased investment in transportation, restructuring energy sources and green consumer measures. Some plans also address community growth,

planning and sprawl. Many municipalities develop their Climate Change Action Plan with funds from the Green Municipal Fund.

Many municipalities are also working to develop a better understanding of the impacts of climate change. Some municipalities are having trouble downscaling global models to the local level, making it difficult to understand the extent of the local problem. There is a large need for localised scientific data and planning. Efforts from Ontario's Expert Panel on Adaptation and the Ontario Centre for Climate Impacts and Adaptation Resources Centre may be helpful.

What needs to be done

The Mayors support a significant reduction of untreated or inadequately treated sewage and contaminated stormwater being released into the Lakes. To achieve this will require increased collaboration, investments and new creative approaches from all three orders of government.

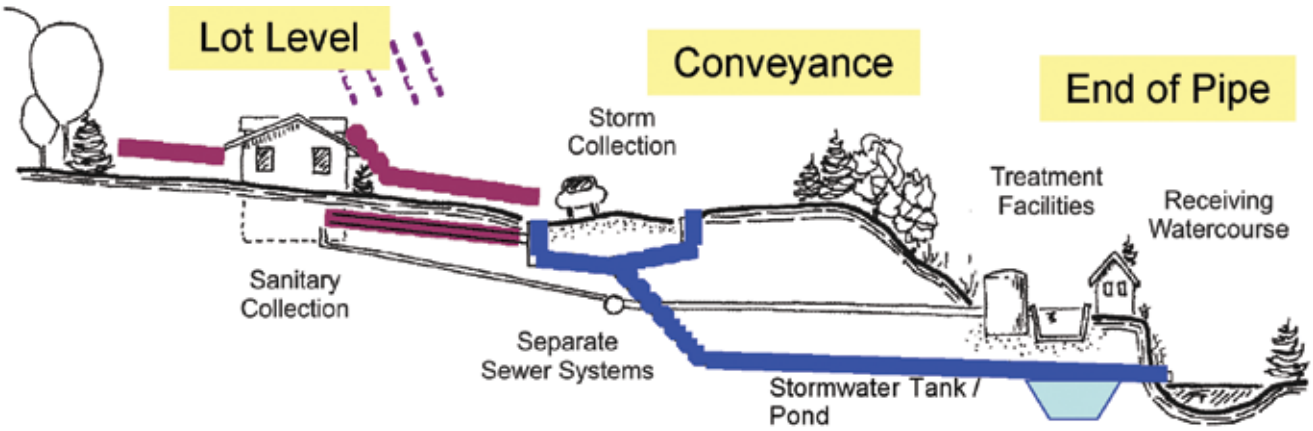
Stormwater

New Approach

Making progress on stormwater will be important to improve people's enjoyment of the Great Lakes, such as beaches and reducing algae. Progress starts with a new approach to stormwater management: one that recognises stormwater as a resource requiring careful management. This is a change from the traditional approach viewing stormwater as a "problem", and the "cure" designing the quickest possible route to the nearest pipe. Under the old approach, stormwater was treated as though it was not contaminated, and now we need to recognise that stormwater picks up both bacterial and toxic contaminants and can be a major source of pollutants to the nearshore zone.

The new stormwater approach recognises a hierarchy of actions. First and foremost, the priority is to reduce the amount of stormwater entering pipes through lot level controls, increased infiltration, minimizing impervious surfaces, disconnecting downspouts, increased vegetative swales, green roofs and implementing other forms of green infrastructure. Second, it is important to reuse stormwater through rain barrel harvesting and other methods. Third, this approach involves slowing down, cleaning and recycling stormwater through storage in pipes, ponds and tanks. Lastly, some form of end of pipe treatment may be required. This approach has different names such as "treatment train approach" or "lot level, conveyance level and end of pipe level controls".

In particular, municipalities are interested in approaches which emphasise the first and second rungs on the hierarchy, i.e. those that prioritize reduction and reuse over detention and treatment. These approaches are often the most cost effective and yield large environmental benefits.



New Plans

The key to progress on stormwater is comprehensive innovative planning. Each municipality needs an up-to-date stormwater master plan in place which incorporates a treatment train approach and green infrastructure measures. Municipalities and relevant federal and provincial agencies should share best practices, and regulatory agencies should allow for flexibility in approvals, to enable innovative solutions such as the use of grey water, rainwater harvesting, and downspout disconnection programs.

Many municipalities and agencies have set numerical goals for reduction in stormwater runoff and peak flows. Municipalities and the Province could continue to work together through the stormwater review to examine the benefits of setting numerical targets for reduction in runoff and peak flow. This could result in new design standards, and the development of regulatory instruments to help advance the implementation of "at source" measures. Municipalities may wish to develop or incorporate these targets within their stormwater plans.

Municipalities are also interested in managing new development to ensure no net increase in wet weather flow occurs from predevelopment levels (many have guidelines and targets for stormwater plans for new development, i.e. minimum retention 5mm).

Municipalities have expressed a need for increased funding for the development and implementation of wet weather flow or stormwater master plans. There are very few funding sources for the development of stormwater master plans and implementation of stormwater projects. The Building Canada Fund and other funds need to play a major role in funding stormwater and CSOs. In other jurisdictions, states and federal governments often have a more direct policy and funding role in stormwater.

The current COA calling for actions to reduce nutrients and contaminants from stormwater is mainly limited geographically to areas of concern. While there have been some efforts to link to lakewide management plans, these could be made more specific. The stormwater scope needs to be expanded in COA to allow provincial and federal funding for stormwater projects in areas outside of areas of concern.

New Partners

Municipalities want to work with the Province to begin the steps that lead to improvements in stormwater management. This will require new leadership from all parties - federal, provincial and municipal - and greater collaboration with other groups.

Traditionally, stormwater management was seen as a municipal and/or Conservation Authority responsibility. The Province and Federal Government has had limited direct policy, funding or regulatory role on stormwater. In the US, federal and state governments are becoming increasing active in encouraging, funding and communicating about stormwater, especially methods to reduce CSOs and manage wet weather flow through green infrastructure.

In addition, with the new challenges presented by climate change, we need new partnerships on stormwater. It is time for the federal, provincial and municipal governments and others to work together to encourage a new approach to and funding for stormwater.

New Technologies

There has been an explosion of interest in stormwater and green infrastructure methods. One of the main methods to reduce stormwater runoff is to increase the infiltration of stormwater into the ground, often by reducing impervious surfaces. There are many new technologies such as permeable pavement, swales, vegetative liners, and soaking pits than can help increase infiltration and minimise stormwater generation. Some municipalities are using "purple pipes" to encourage the use of rain or rinse water for some uses such as toilets and irrigation in residential/commercial/municipal buildings. In addition to engineered human-designed systems that mimic nature in function, such as green roofs, there are maintenance of natural ecological processes including urban forests, wetlands, waterways and other areas.

Municipalities want to work together to reduce CSOs and manage wet weather flows through green infrastructure and innovative planning tools wherever possible. Green infrastructure that involves "moving up the pipe" represents a critical area because it can cost less than expanding sewage treatment plants and separating combined sewer systems. Municipalities would like to work with the Province and Federal Government to support the mainstreaming of low impact development, green infrastructure, and other innovative stormwater management practices (at lot level and conveyance) as well as other methods to improve municipal resiliency and adaptation to increased intensive wet weather events.

The Province and Federal Government could play an important role here in collecting, publishing, evaluating and monitoring new stormwater methods and in funding stormwater master plans and innovative pilot projects. This could result in new design standards, and the development of regulatory instruments to help advance the implementation of at source measures. These could be part of the provincial stormwater review. The Province could consider updating guidance on stormwater.

Municipalities, the Province and the Federal Government could also explore methods to reduce the contaminants entering stormwater in the first place, methods to remove contaminants from stormwater, and research to determine the possible impacts of stormwater infiltration on groundwater quality.

The Province may need to consider implementing some changes in its approvals processes. Currently innovative projects often go to the back of the approvals line because they are not straight forward, require additional time to review and sometimes additional explanation and research. The Province needs to find ways to reward innovative projects or at the very least avoid penalizing innovative projects with slower approvals.

Some municipal stormwater ponds were built long ago, and in the next few years, will require significant maintenance. There is a need for guidance and funding for proper maintenance procedures. In addition many government agencies currently forbid the creation of stormwater ponds in hydro corridors. We need to work together to better understand and potentially overcome resistance to stormwater ponds.

To start making progress, municipalities are interested in working with the Province and Federal Government on 10 projects that apply new approaches by 2011.

Examples of Green Infrastructure Techniques

- Use of rain water (both on-site and on larger multi-lot areas);
- Reuse of treated wastewater effluent or rainwater for irrigation purposes;
- Green development/low impact standards to minimise impervious surfaces and maximise infiltration (e.g. bioswales; stormceptors; green roofs; soaking pits, pervious pavement, integrated landscape management, etc.);
- Best management practices and incentive programs for rural properties and communities;
- Innovative planning tools (density transfer; density bonus etc.) to support green infrastructure implementation at the site level;
- Stewardship best management practices;
- Innovative financial tools to promote green infrastructure (example: tax increment financing).

Wastewater

Conserving Water & Energy

Water conservation measures are an important element in reducing flows to wastewater treatment facilities. Water conservation is rising on the public policy agenda with the final ratification of the Great Lakes Charter Annex and Compact by the eight Great Lakes states, two provinces, and the U.S. Government. As part of the Annex/Compact, provinces and states will develop and implement water conservation plans within the next 5 years. The Great Lakes and St. Lawrence Cities Initiative has issued a challenge to its members to reduce water use by 15% over 15 years. Over 30 members have signed up for the Water Conservation Framework.

In the spirit of reducing energy and wastewater loads, municipalities, together with provincial and federal support, need to develop and implement water conservation and efficiency plans. Municipalities are interested in reducing water use, to: reduce bypasses and CSOs; reduce the need to increase municipal drinking water and wastewater systems capacity; save money and energy; and reduce greenhouse gas emissions.

Ontario municipalities and the Province could also focus their communications efforts on a broad water conservation campaign. This would help raise public awareness of water and the Great Lakes and the need for its protection.

There is the need for the Province to restrict further the use of water guzzling toilets and other appliances. Removing these water guzzlers from sale, as is the practise in other jurisdictions, would help municipalities reduce water use, save energy and reduce sewage bypasses and overflows. The Province could also develop a standardized/model water efficiency plan, support the development and implementation of municipal water efficiency plans and a public campaign on water conservation, and other measures, in cooperation with municipalities.

In addition, some municipal operations are energy intensive. Many municipalities have been active on energy conservation measures for years, but this work needs to be further supported. Some municipalities are also actively exploring alternative energy generation/ GHG reduction technologies.

Municipalities are also interested in exploring methods to extract heat from wastewater, methane generators for larger plants, wind energy projects and ways to further encourage green buildings and energy use. These areas could be included in the next round of proposals for renewable energy request for proposals.

Accelerating MOE Wastewater Review

The Province already has a number of policies in place to address wastewater. The Government of Ontario is currently reviewing its wastewater policies, including a review of its regulation of wastewater facilities and a review of F series policies, such as policy F-5-5 which guides wastewater management and combined sewers. MOE Policy F-5-5 promoted action by municipalities with combined sewers. The targets are clear, but support is needed for implementation of this work. In addition, many of the timelines in the review could be accelerated.

Municipalities have developed pollution prevention and control plans, but some may need to be updated to incorporate innovative practices. The emphasis should be on updating and implementing municipal pollution control and prevention plans.

There is growing pressure to better understand, monitor and report on the frequency, volumes and causes of bypasses, CSOs and overflows. Because of the number of CSOs in some municipalities, we need to decide the balance between monitoring and remedial action. While municipalities support increased knowledge about stormwater and sewage loads, many believe that there are multiple "no regret actions" which make sense now.

Upgrades to municipal wastewater treatment facilities continue to be a challenge for municipalities with limited financial resources. The separation of stormwater and sanitary sewage systems in municipalities is proceeding slowly. Good progress is being made in Kingston, Toronto, Hamilton, Niagara and Windsor, among others. These are multi-year and multi-million dollar projects that are expected to show significant results in the coming years.

Developing New Methods

The provincial and federal government could provide a useful role in collecting, analysing and communicating new methods of CSO control technology. Methods of CSO control technology are changing rapidly, and it would be helpful for municipalities to have improved analysis, assessment, post implementation monitoring, and communication about newer methods. In the United States, the EPA has conducted good research on new CSO technology.

Replacing Leaking Septic Tanks

Some municipalities along Lake Erie and Lake Huron are concerned about the impact of leaking septic systems on nearshore water quality. Many leaks from septic tanks do not bubble to the surface but drain down, particularly in areas of fractured geological landforms with little soil cover. These types of leaks are hard to detect. While property owners are responsible for building, maintaining and inspecting septic tanks, municipalities and the Province have a role to play. Where septic tanks may pose a significant threat to drinking water, the Province, through the Clean Water Act, has been pursuing building code changes. The Province also provides some financial support for upgrading septic systems within a wellhead's two year time of travel zone under the Drinking Water Source Protection program. While a welcome step forward, for many local areas this restriction excludes a significant number of septic tanks.

The high cost of upgrading and installing a new septic system (which can be $5,000-10,000) is a barrier to many homeowners who need to fix their leaking system. The Province could consider enhancing the grant program, or creating a low interest loan program or other financial mechanisms to help support the financing required to upgrade these systems.

Climate Change

Designing & Adapting Infrastructure

Municipalities are already experiencing increased storm intensity from climate change resulting in huge challenges for wastewater and stormwater. There is a lot of interest in changing infrastructure design and practises to better respond to changing weather patterns. Current design and intensity, duration and frequency weather curves are not adequate. In addition, we need to design and protect overland flow routes so that when flow overtops, there are planned corridors that bypass the area without damaging buildings, homes, industry or wastewater treatment plants.

Assessing Vulnerabilities & Impacts

Municipalities are concerned about the huge capacity and investments likely to be needed to assess infrastructure for vulnerability, update and rehabilitate infrastructure, and adapt health, social and emergency systems to climate change. Some municipalities are well along the road of climate change programs, and others are just beginning. There are many actions with which municipalities could proceed now, as no-regrets measures.

Municipalities would like assistance with assessing the vulnerability of their infrastructure and incorporating necessary design changes.

Municipalities would also benefit from an assessment of the impacts of climate change on their local area, including an increased understanding of the impact on water quality. This could include an assessment of the impact of changing lake levels, increased erosion, increased frequency and intensity of storms and water temperature on water quality, including contaminant and bacterial levels. It could also involve assessing the potential for reduced groundwater levels and its impact on quality, as well assessing the needs of municipalities for wastewater and stormwater infrastructure changes.

Developing Action Plans & Models

Building upon existing programs such as Partners for Climate Protection, each municipality could develop and implement a climate change action plan including: a greenhouse gas inventory, development of reduction targets, energy efficiency and water conservation programs, as well as green building programs. Federal and provincial assistance could help speed the development and implementation of these plans.

Municipalities would also like to collaborate on downscaling global climate models to local areas. This would provide a better sense of future weather in a particular community, allow for better understanding of impacts and better planning for adaptation measures, and increase a municipality's ability to communicate climate change issues at the local level.

ACTION 5: Build a Business Case and Measure Results from Great Lakes Investments

5.1: Municipalities work together with the provincial and federal governments and others on economic studies of common Great Lakes shoreline activities, including economic modeling using local community input, both to develop the business case to drive investments in the Great Lakes and to measure the results of the investments made.

What municipalities are experiencing

In general, municipalities and other groups often find it difficult to quantify the benefits of a particular environment project in economic terms. This has been a barrier to building the case for support of municipal shoreline projects and initiatives. Municipalities have an interest in working together to define the economic benefits related to shoreline projects and to communicate these benefits when advocating for the Great Lakes protection and restoration. This would help justify investment in Great Lakes projects when municipalities are applying for provincial and federal funding programs. Many municipalities noted that when a project's benefits are quantified in economic terms, it can be the tipping point for project approval.

What needs to be done

Municipalities are interested in working with other levels of government and other groups to build and communicate the business case for investment in ecosystem restoration or protection projects, particularly infrastructure related projects that support Great Lakes priorities, and to measure the results of these investments.

One role for economic valuation is to inform decision-making in the Great Lakes Basin. This includes assessing the benefits of rehabilitating ecologically-damaged sites, evaluating the costs of pollutants and invasive species, and helping to inform land use planning. As an example, reports issued by the Brookings Institution in the United States have been powerful in quantifying the value of the Great Lakes (second largest regional economy in the world) and the value of investments in restoration (providing a 2:1 return on investment).

Municipalities are also interested in economic modelling which engages communities in defining benefits. For example, the Hamilton Harbour "mediated modelling approach" could be a model for future areas, particularly to increase the business case for restoration and protection. In this approach, stakeholders worked with experts to develop a relevant and meaningful economic model, rather than following a top-down technical report produced by experts in isolation. This provided an opportunity to develop a model that more accurately forecasted benefits, linked hard and soft metrics, and estimated return on investment. Some of the outcomes were a greater sense of informed priority setting, the ability to mobilize funding, and substantive stakeholder engagement. Municipalities feel the success of this approach and the lessons learned are transferable to other sites and situations around the Great Lakes.

Another role for economic studies is to connect government with a wide range of Great Lakes partners by way of illustrating how the Basin contributes to wealth and well-being and how different levels of government and community partners can collaborate with each other on Great Lakes issues and solutions. Quantifying the benefits of protection and restoration can be useful in communicating with municipal departments that rely heavily on numerical values when making decisions. Partners are increasingly taking an interest in linking economics and ecology. The Province has started efforts in this area and could provide increased economic leadership and assistance.

Finally, economic studies help to measure results, thus demonstrating the true value of investments after they are made.

There are many examples of costs associated with degradation of the Great Lakes. For example, in recent years algal growth has increased to such a level that is clogging intake pipes used for cooling water in industry and electricity generation. This clogging can cause the plants to reduce production in order to clear the intake screens and restore normal flow. These costs can be high- in the millions of dollars. These costs can also be widespread across the Lakes. An economic study would include a quantification of the economic and social costs of algae, and begin to build a business case for better controls.

Municipalities, public health units, conservation authorities, and the federal and provincial governments should work together to quantify the social and economic benefits of beaches, and to communicate these results broadly. For example, some analysis has been undertaken of the costs of beach closures (i.e. Lake Michigan beach closing from $7,935 to $37,030 per day of beach closing), and the costs that people spend on beach related products such as sunscreen (over $600 million a year). Current work by the International Joint Commission may help here.

Currently there are many ecosystem services provided by the environment that are directly connected to economic and social wellbeing, but are not reflected in economic indicators. These include pollination, flood control, nutrient cycling and waste decomposition, carbon sequestration and climate regulation, food production, biodiversity protection, wildlife habitat, and purification of water and air, among others. The purpose of analyzing and mapping these "ecosystem services" is to understand the economic value behind the benefits of protection, conservation, and restoration. This kind of analysis helps bridge the gap between science and economic policy. Maps on the value of ecosystem services could be used by municipalities as a way of building a business case for Great Lakes protection. These maps are currently being developed by Ministry of Natural Resources at different geographic scales and could be useful for municipal planning purposes. Municipalities are interested in working with Ministry of Natural Resources and others on these to further develop "natural capital" and "ecological services" valuations.

We are eager to start the work on valuing our Great Lakes, so that we can have a better Business Case to invest in their protection at the municipal, provincial, and federal levels.

3. Conclusion

Since its signing in July 2008, the COA MOC has already reaped benefits for Great Lakes protection. Over the past six months, municipalities and the provincial government have discussed science, policies and possible actions. In the process, a solid foundation has been built for a continued collaborative relationship, an essential ingredient to make significant progress on Great Lakes protection at the local and provincial levels.

This Mayors' Report is the first milestone to be achieved under the Canada- Ontario Agreement Memorandum of Cooperation. It is now time to roll up our sleeves and further define the collaborative actions to be undertaken and the timelines within which to complete them.

Through deliberations, and in discussions with provincial representatives, the Mayors identified 5 action areas where progress may be made through collaboration between and among municipal, provincial and federal governments.

This increased collaboration should be reflected in a Great Lakes table for municipal mayors and provincial and federal ministers. This would include continued municipal input in the COA 2010 negotiations.

The Mayors of the Great Lakes believe firmly that it is only by all three orders of government working together, and engaging the public, that we can protect and promote the Great Lakes as the national treasure that it is.

Appendices

Appendix 1: Summary of Recommendations

The Great Lakes Mayors report outlines the components of this five point collaborative action plan, and makes the following recommendations:

ACTION 1: Create a municipal-provincial-federal Great Lakes Table

1.1: Create a senior municipal-provincial-federal Great Lakes Table, with Mayors and Ministers meeting at least once a year, to report on progress, discuss ideas and move forward collaboratively on Great Lakes protection.

ACTION 2: Improve and Promote Beaches, Natural Areas, Waterfronts, Trails and Tourism

2.1: Develop a joint beaches strategy, with a target date of 2015 to have Ontario beaches open a minimum of 80% of the swimming season.

2.1.1: The joint beaches strategy would include, but not be limited to:

- Measures to improve beach management, assessments, and exchange of best practices, with funding support
- Improved beach monitoring and monitoring methods, including predictive modelling and real time beach quality indicators; increased monitoring frequency; increasing the number of Great Lakes beaches monitored and revised monitoring and posting criteria, with funding support
- Measures to increase people's use and appreciation of beaches, e.g. through a beach certification program such as the Blue Flag program; and better public information on beach quality
- Research on improving our understanding of rates of illness associated with beach use.

2.1.2: Create a Beach Office within the provincial government to lead development of the beaches strategy, in conjunction with a new Beaches Panel of provincial, federal and municipal governments and other interested groups.

2.2: Work with the provincial government to increase the support and funding for natural areas, waterfronts, trails and tourism along the Great Lakes, including the implementation of biodiversity and natural heritage plans and promotion of volunteer activity for local shoreline clean-up activities.

2.3: Work with municipal, provincial, federal governments and others to develop methods to foster people's awareness, connection and enjoyment of the Great Lakes, including a marketing and tourism program geared to identifying the Great Lakes as a national treasure.

ACTION 3: Attack Nuisance and Toxic Algae

3.1: Work with municipal, provincial, federal government and other parties, undertake a comprehensive algae control plan to reduce phosphorus concentrations in the nearshore and tributaries to a level that prevents nuisance growth of alga.

3.1.1: The algal control plan would:

- Identify areas seriously affected by algae.
- Where necessary, undertake research to establish the sources, amounts and loadings of nutrients to the watershed and nearshore in these areas.
- Develop lakewide and local nutrient control plans.
- Based on conclusions, implement control measures which give the greatest nearshore improvements.

3.1.2: Encourage the provincial government and others to increase research into algae growth and control measures, including:

- Increasing the translation of current science into practical control measures.

- Sharing and application of lessons learnt from existing research partnerships to other areas of the Lakes.
- Supporting the development and implementation of innovative non-point source control measures.
- Supporting and participating in new provincial and federal research to develop further Predictive Frameworks for Management of Cladophora Biomass and blue green toxic algae.

ACTION 4: Reduce Untreated Sewage and Stormwater Discharges Entering the Great Lakes, in Light of Climate Change and Technical Innovations

4.1: Call on the federal and provincial governments to assist and encourage municipalities, through policy guidance and technical and financial support, to develop and update their pollution control and prevention plans or other planning methods to reduce sewage discharges.

4.1.1: Calling on the provincial and federal government to adopt aggressive water conservation measures including: a ban on the sale of water guzzling 13 litre toilets and other inefficient appliances, develop a standardized/"model" water efficiency plan, support the development and implementation of municipal water efficiency plans and a public campaign on water conservation, and other measures in cooperation with municipalities.

4.1.2: Municipalities working with federal and provincial governments on innovative funding options to accelerate projects to address combined sewer overflows.

4.1.3: Accelerating the current Ministry of Environment's wastewater review.

4.1.4: Encouraging the development and funding of new more innovative methods of treating sewage.

4.1.5: Reviewing the need for the provincial or federal government to enhance low interest loans and other mechanisms to owners to replace or upgrade leaking septic systems.

4.2: Call on the federal and provincial governments to assist and encourage municipalities, through policy guidance and financial support, to develop, update and implement their integrated stormwater master plans to adopt a new approach to stormwater management that prioritises reduction and reuse of stormwater over treatment and retention.

4.2.1: Increase provincial and federal support for research, analysis, implementation and post implementation monitoring on new and more innovative methods of stormwater control, which could result in new design standards, and the development of regulatory instruments to help advance the implementation of at source measures, including 10 projects that apply the new approach by 2011.

4.3: Call on the Federal Government and others to review and modify current infrastructure design criteria which no longer reflect the reality of precipitation rates due to climate change. To increase the pace of adaptation to climate change by:

- Municipalities work with federal and provincial governments to collaborate on new tools to design and adapt infrastructure to be climate ready.
- Municipalities work with federal and provincial governments to develop and implement local climate change plans, including improved identification and response to local impacts and translating global scale climate change models to local scale impacts.

ACTION 5: Build a Business Case and Measure Results from Great Lakes Investments

5.1: Municipalities work together with the provincial and federal government and others on economic studies of common Great Lakes shoreline activities, including economic modeling using local community input, both to develop the business case to drive investments in the Great Lakes and to measure the results of the investments made.

Together, during the COA MOC process, we have identified some key areas of mutual interest on which to further collaborate and set goals for action. The Ontario municipal sector is interested in further defining the actions, projects, players and places to work cooperatively to carry out these recommendations.

Appendix 2: Great Lakes Mayors and Chairs

Mayor Ellen Anderson, Town of The Blue Mountains

Regional Chair Gary Carr, Halton Region

Mayor Randy Hope, Municipality of Chatham Kent

Mayor Brian McMullan, City of St. Catharines

Mayor David Miller, City of Toronto

Regional Chair Peter Partington, Niagara Region

Mayor Lynn Peterson, City of Thunder Bay

Mayor Harvey Rosen, City of Kingston

Mayor Deb Shewfelt, Town of Goderich

Appendix 3: Members of the Municipal Working Group

Lake Superior
Kerri Marshall (Manager, Environment), Darrell Matson (General Manager of Transportation & Works) and Jim Vukmanich (Chief Chemist), City of Thunder Bay

Georgian Bay
Paul Graham (Chief Administrative Officer), Town of The Blue Mountains

Lake Huron
Jennette Walker (Environmental Services Technologist), Town of Goderich, and Pamela Scharfe (Retired Public Health Manager, Huron County Health Unit) representing the Town of Goderich

Lake Erie
Rob Bernardi (Facilities & Systems Manager), Chatham-Kent Public Utilities Commission, representing the Municipality of Chatham-Kent

Lake Erie and Lake Ontario West
Mary Lou Tanner (Manager, Water and Wastewater Services) and Betty Matthews-Malone (Director, Water and Wastewater Services), Niagara Region

Lake Ontario West
Mark Green (Manager of Environmental Services), City of St. Catharines;
Kiyoshi Oka (Director, Environmental Services) and David Andrews (Manager, Wastewater Operations), Halton Region

Lake Ontario Central
Lou Di Gironimo (General Manager, Water and Wastewater), Michael D'Andrea (Director, Water Infrastructure Management), and Sherri Hanley, Corporate Management & Policy Consultant, City of Toronto

Lake Ontario East
Paul MacLatchy (Director of Strategy, Environment & Communications), City of Kingston

Great Lakes and St. Lawrence Cities Initiative
Nicola Crawhall (Deputy Director), Sarah Rang (Acting Deputy Director), and Korice Moir (Project Assistant)

Association of Municipalities of Ontario
Craig Reid (Senior Policy Advisor)

Appendix 4: Members of the Joint Municipal-Provincial Committee

The Joint Municipal-Provincial Committee consists of the municipal representatives listed in Appendix 3 and the following provincial representatives:

Ministry of the Environment

Sharon Bailey (Director, Land and Water Policy Branch)

Carolyn O'Neill (Manager, Great Lakes Office, Land and Water Policy Branch)

Elizabeth Everhardus (External and Stakeholder Relations Coordinator, Great Lakes Office, Land and Water Policy Branch)

Richard Raeburn-Gibson (Assistant Director/Program Services Manager, Operations Division, Eastern Region)

Conrad De Barros (Canada-Ontario Agreement/Great Lakes Divisional Project Manager, Operations Division, Eastern Region)

Brent Wisken (Policy Analyst, Great Lakes Office, Land and Water Policy Branch)

With assistance from: Cristina Carambus, Tim Fletcher, Todd Howell, Madhu Malhotra, Rachel Melzer, Eric Miller, Nathalie Osipenko, Jeremy Pasma, and Matt Uza.

Ministry of Natural Resources

Eric Boysen (Director, Great Lakes Branch)

Gary Ward (Great Lakes Senior Program Advisor, Policy and Program Section)

With assistance from: Mark Heaton, Barbara Mabee, Rob Messervey, Bev Ritchie, and Dawn Walsh.

Ministry of Agriculture, Food and Rural Affairs

Jim Richardson (Director, Environmental Management Branch)

Peter Meerveld (Acting Director, Food Safety and Environmental Policy Branch)

Scott Duff (Manager, Program Coordination, Research and Partnerships)

Michele Doncaster (Rural Policy Adviser, Rural Development Policy)

With assistance from: Joel Locklin, Earl Pollock, and Stewart Sweeney.

Also acknowledging helpful assistance from:

Ministry of Tourism (Henry Turner)
Ministry of Health and Long-Term Care (Tony Amalfa)
Ministry of Economic Development (Sumera Nabi)
Laurentian University (David Pearson)

www.glslcities.org

PHOTO CREDITS: Many of the photographs in this report were kindly provided by the following municipalities: Town of The Blue Mountains, Municipality of Chatham-Kent, Town of Goderich, City of Thunder Bay, and City of Toronto. Others were retrieved from Environment Canada, Ontario Ministry of the Environment, and Ontario's North.

Great Lakes and St. Lawrence Cities Initiative
Alliance des villes des Grands Lacs et du Saint-Laurent

FSC