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# **A SWOT Analysis of the Great Lakes Water Quality Protocol 2012: The Good, the Bad and the Opportunity**

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## **Abstract**

Since the signing of the Great Lakes Water Quality Protocol by Canada and the United States on September 7, 2012, there has been no review of it in the literature. This paper aims to fill that gap by conducting a Strength, Weakness, Opportunity and Threats (SWOT) analysis that will aid in deducing strategies to maximize the strengths and opportunities and minimize the weaknesses and threats to achieving the purpose of the Protocol. The review found that the Protocol has maintained the basic visionary infrastructure retaining the purpose and main objectives while broadening the scope to include three new Annexes; Aquatic Invasive Species, Habitat and Species and Climate change. Weaknesses include instances of ambiguous language, the separate treatment of groundwater, lack of Annex on Indigenous engagement and discrepancies between the principles and the Annexes. A key threat remains the lack of resources for the implementation of the Protocol.

## **Introduction**

The Laurentian Great Lakes is the largest freshwater body in the world, accounting for 20 percent of the world's total freshwater (Environment Canada and US EPA, 2004). It is the most important water source in North America having social, economic and environmental significance. The lakes' basin houses 40 million North Americans. However, while the lakes have provided social and economic benefits to the residents, there have been the antithetical harmful anthropogenic effects that triggered the degradation of the lakes ecosystem. Recognition of this effect of humans on the lakes led to the signing of the 1972 Great Lakes Water Quality Agreement. Implementation of the Agreement was credited with environmental benefits such as reduction of phosphorous inputs into Lake Erie and the concomitant reduction in eutrophication.

Despite this success, the lakes ecosystem is still being degraded. Some argue (Manno and Krantzberg, 2008) that the snail pace of amending the agreement, long after the stipulated time frame is one contributing factor. The calls to amend the 1987 agreement were first answered with the commencement of the review process in 2004 and a review report issued in 2007 (binational.net, 2013). This finally culminated in an amended Great Lakes Water Quality Protocol in 2012 (The Protocol). Since the signing of the Protocol on September 7, 2012, there has been no comprehensive review of its content to date. This paper aims to undertake that review with a Strength, Weakness,

Opportunities and Threats (SWOT) analysis that can prove useful for decision makers in the implementation of the agreement.

### The Great Lakes Water Quality Agreement through the years

As a result of pollution events during the 1960s and the public outcry on environmental disasters such as the fires on the Cuyahoga River and the hypoxic condition of Lake Erie that led to the signing of the first Great Lakes Water Quality Agreement in 1972 (Botts and Muldoon, 2005). This first agreement focused on the reduction of phosphorous to address massive algal blooms that depleted oxygen and led to dying of fish and disruption of food webs. Successful implementation actions included the upgrading of sewage treatment plants, elimination of phosphorous in household detergents and the control of point source industrial pollutants (Botts and Muldoon, 2005). The agreement called for review every six years, a time frame that was not always adhered to (Figure 1). The first review led to the 1978 agreement. While the 1972 agreement was “determined to restore and enhance water quality in the Great Lakes System”, the 1978 agreement introduced the ecosystem approach through the explicit purpose “to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem.

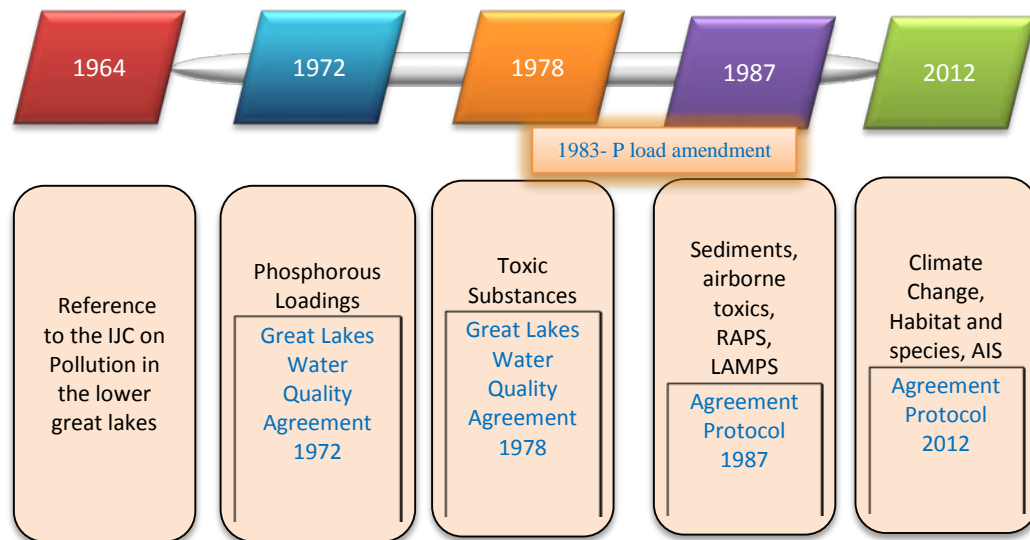


Figure 1: Key milestones in the Great Lakes Water Quality Agreement

This agreement was credited with the introduction of the ecosystem approach on the global scale and was used by the US Commission for Ocean Policy in their recommendations for Oceans and Coasts in 2004 (US Commission for Ocean Policy, 2004). This ecosystem approach was based on the premise that all components of the environment were interconnected and that human health and environmental quality issues should be treated in an integrated manner (IJC, 2013). The 1978 Agreement also addressed the challenge of persistent toxic substances and listed priority toxic chemicals that needed urgent action. It called for virtual elimination through ‘zero discharge’ of

inputs. This agreement was further amended in 1983 to include a Phosphorous load reduction supplement to Annex 3 which outlined basin wide phosphorous reduction plans.

The next amendment by protocol in 1987 further elucidated the concept of ecosystem management through the incorporation of Lakewide ecosystem objectives and Remedial Action Plans (RAPS). This version included new annexes for non-point source pollution, contaminated groundwater, air quality and coordinated research and development. Another new annex, Lakewide Management Plans (LaMP) was introduced to address contamination of whole lakes by persistent toxic substances.

There were major changes to the governance arrangement in this version of the agreement. Some of the new annexes required that the governments provided biennial progress reports on environmental quality to the International Joint Commission (IJC), thereby removing the data collection and reporting responsibility of the IJC's Water Quality Board. The Binational Executive Committee (BEC) was formed by the governments to meet twice a year to coordinate work plans. Some argue that the creation of the BEC lead to duplication of functions and eroded the IJC's authority, which proved detrimental to the effectiveness of the agreement (Botts and Muldoon, 2005). This growing dissatisfaction spurred renewed calls for the review of the Agreement, which was due for long past the 1992 renewal timeline.

### **The Great Lakes Water Quality Agreement Review Process**

The IJC's 12<sup>th</sup> Biennial Report issued a strong call for the renewal of the Agreement by reminding readers that the Agreement was not updated or changed in more than 17 years, while science and technology has grown in leaps and bounds and as such, "we need to keep pace with what we know and review the Agreement with an eye toward a sustainable future" (IJC, 2004).

The governments finally got on board with the review process in 2006 and called upon the IJC to facilitate public participation (IJC, 2013). Key timelines in the review process is shown in Table 1.

Date	Event
April 2004	IJC 12 <sup>th</sup> biennial report calling for review
May 2006	Formal commencement of the review process
2007	Canada and the US completed review of 1987 Agreement and concluded that the agreement is outdated and cannot address current water quality threats.
June 13, 2009	the Canadian Minister of Foreign and U.S. Secretary of State announced that the two countries would begin negotiations to amend the Agreement
January 2010	U.S. EPA's Great Lakes National Program Office (GLNPO) and Environment Canada announcement of a binational webinar for Great Lakes partners, stakeholders and the public.
January 27, 2010	First formal negotiating session for amending the GLWQA concluded by senior Environment Canada, Foreign Affairs and International Trade Canada and US Department of State and the U.S. Environmental Protection Agency
April 8, 2010	Environment Canada, Foreign Affairs and International Trade Canada, the U.S. Department of State and the U.S. Environmental Protection Agency officials met for the second formal negotiating session for amending the GLWQA
June 2010	Series of public binational webinars hosted by government of US and Canada
July 2010	Deadline for written public comments
Fall 2010	Planned in person meetings, one in Canada and one in US. These did not occur at that time.
June 16,17, 2011	Third formal negotiating session for amending the GLWQA concluded by senior Environment Canada, Foreign Affairs and International Trade Canada and US Department of State and the U.S. Environmental Protection Agency
October 24, 25, 2011	Fourth formal negotiating session for amending the GLWQA concluded by senior Environment Canada, Foreign Affairs and International Trade Canada and US Department of State and the U.S. Environmental Protection Agency
September 2011	Conference calls held at request of several dozen NGOs to discuss governance, toxic substances, nutrients, climate change, habitat and species protection, aquatic invasive species, and the coordination of science and research in the Great Lakes region
September 7, 2012	Signing of the Protocol in Washington by Canada's Environment Minister Peter Kent and the US EPA's Administrator Lisa Jackson.

Table 1: Key Milestones leading up to the signing of the Great Lakes Water Quality Protocol 2012 (US and Canada Binational, 2014)

## **The Great Lakes Water Quality Protocol 2012**

The Great Lakes Water Quality Protocol 2012 (the Protocol) was signed on September 7, 2012 by Canadian Environmental Minister Peter Kent and USEPA Commissioner and the United States Environmental Protection Agency Administrator Lisa P Jackson (IJC, 2013). The purpose of the 1987 agreement was kept in the Protocol but its scope was expanded to include contemporary issues such as climate change, aquatic invasive species and habitat and species and the nearshore areas of the Great Lakes. One key inclusion is the opportunity for engagement of tribal governments, First Nations, Metis, municipal governments and the broader public in the Great Lakes Executive Committee. There was further clarification of the roles and responsibility of the IJC under the Protocol.

The Protocol consists of two main sections, the Articles and the Annexes. Much like the previous versions of the Agreement, the Articles contains definitions, purpose, goals, general objectives and institutional arrangements (see Table 2). The Annexes contains more specific objectives and unlike previous versions of the agreement, the Protocol contains three new Annexes for Climate change, Habitat and Species and Aquatic Invasive Species (see Table 3).

Article	1972	1978	1987	2012
1	Definitions	Definitions	Definitions	Definitions
2	General Water Quality Objectives	Purpose	Purpose	Purpose, principles and approaches
3	Specific Water Quality Objectives	General Objectives	General objectives	General and specific objectives
4	Standards and Other Regulatory Requirements	Specific Objectives	Specific Objectives	Implementation
5	Programs and Other Measures	Standards, Other Regulatory Requirements, and Research	Standards, Other Regulatory Requirements, and Research	Consultation, management and review
6	Powers, Responsibilities and Functions of the IJC	Programs and Other Measures	Programs and Other Measures	Notification and response
7	Joint Institutions	Powers, Responsibilities and Functions of the IJC	Powers, Responsibilities and Functions of the IJC	International Joint Commission
8	Submission and Exchange of Information	Joint Institutions and Regional Office	Joint Institutions and Regional Office	Commission Boards and Regional Office
9	Consultation and Review	Submission and Exchange of Information	Submission and Exchange of Information	Existing rights and obligations
10.	Implementation	Consultation and Review	Consultation and Review	Integration Clause
11.		Implementation	Implementation	Amendment
12.		Existing Rights and Obligations	Existing Rights and Obligations	Entry into force and termination
13.		Amendment	Amendment	Supersession
14.			Entry into force and termination	
15.			Supersession	

Table 2: At a Glance -changes in the Articles of the Great Lakes Water Quality Agreement 1972-2012

Annexes	1972	1978	1987	2012
1	Specific Water Quality Objectives	Specific Objectives Specific objectives supplement to Annex 1	Specific Objectives Specific objectives supplement to Annex 1	Areas of Concern
2	Control of Phosphorous	Remedial Action Plans and Lakewide Management Plans	Remedial Action Plans and Lakewide Management Plans	Lakewide Management
3	Vessel Design, Construction and Operation	Control of Phosphorous  Phosphorous Load Reduction Supplement	Control of Phosphorous  Phosphorous Load Reduction Supplement	Chemicals of Mutual Concern
4	Vessel Wastes	Discharges of Oil and Hazardous Polluting Substances from Vessels	Discharges of Oil and Hazardous Polluting Substances from Vessels	Nutrients
5	Studies of pollution from shipping sources	Discharges of Vessel Wastes	Discharges of Vessel Wastes	Discharge from vessels
6	Identification and Disposal of Polluted Dredged Soil	Review of Pollution from Shipping Sources	Review of Pollution from Shipping Sources	Aquatic Invasive Species
7	Discharges from onshore and offshore facilities	Dredging	Dredging	Habitat and Species



8	Joint contingency plan	Discharges from Onshore and Offshore Facilities	Discharges from Onshore and Offshore Facilities	Groundwater
9		Joint Contingency Plan	Joint Contingency Plan	Climate change impacts
10		Hazardous Polluting Substances Appendix 1 – Hazardous Polluting Substances Appendix 2 – Potential Hazardous Polluting Substances	Hazardous Polluting Substances Appendix 1 – Hazardous Polluting Substances Appendix 2 – Potential Hazardous Polluting Substances	Science
11.		Surveillance and Monitoring	Surveillance and Monitoring	
12.		Persistent Toxic Substances	Persistent Toxic Substances	
13.		Pollution from Non-Point Sources	Pollution from Non-Point Sources	
14.		Contaminated Sediment	Contaminated Sediment	
15.		Airborne Toxic Substances	Airborne Toxic Substances	
16.		Pollution from Contaminated Groundwater	Pollution from Contaminated Groundwater	
17.		Research and Development	Research and Development <i>Terms of reference for the Joint Institutions and the Great Lakes Regional Office</i>	

Table 3: At a Glance -changes in the Annexes of the Great Lakes Water Quality Agreement 1972-2012

## **Methodology: The Use of SWOT**

The Strength, Weakness, Opportunity, Threat (SWOT) methodology was developed by the Stanford Research Institute (SRI) in the 1960s to aid in strategic planning of businesses (Panagiotou, 2003). . It involves an analysis of the current and future situation; there is an internal scan to determine the strengths and weaknesses that are embedded in the system and an external environmental scan to determine the opportunities and threats that are external to the system that can be harnessed (opportunities) or hinder (threats) the attainment of the objectives. When applied to the Protocol, strengths and weaknesses are factors within the Protocol while opportunities and threats are external to the Protocol.

The SWOT analysis was conducted by the authors through a document analysis, a thorough review of the Protocol and literature relevant to the Great Lakes Water Quality Agreement. It is envisioned that this SWOT analysis will prove useful for implementation of the Protocol by inviting decision makers to consider important aspects of the internal and external aspects of the Protocol.

### **SWOT of the Protocol: The Strengths of the Great Lakes Water Quality Protocol**

This section discusses the strengths of the Great Lakes Water Quality Protocol compared to the previous Agreement. These are elements within the Protocol that are promising for the execution of its reaffirmed commitment “to protect, restore, and enhance water quality of the Waters of the Great Lakes and ....to prevent further pollution and degradation of the Great Lakes ecosystem”.

#### *Retained Purpose of the Agreement*

The purpose of the agreement has changed slightly as “to restore and maintain the chemical, physical and biological integrity of the Waters of the Great Lakes”. The change is in the last few words, where ‘basin ecosystem’ was dropped from the purpose of the agreement. While seemingly insignificant, one wonders why these words were removed. Is this a signal that the ecosystem approach is no longer important? This does not seem to be the case as it is recognized in the introduction that restoration and enhancement of the waters of the Great Lakes depends on “the application of the ecosystem approach to the management of the water quality that addresses individually and cumulatively all sources of stress to the Great Lakes Basin Ecosystem” (US and Canada, 2012). This was reaffirmed in clause 1 Article 2, which articulates that measures should be developed for better understanding of the Great Lakes Basin Ecosystem. For all intents and purposes, the purpose of the Protocol has not changed and its strength lies in the goal to maintain the integrity of the waters of the Great Lakes.

#### *Binationalism*

The Protocol retains the foundation that the earlier Agreements were built on; principles such as binationalism and cooperative action. The preamble to the Protocol captures this in the recognition that “the Agreement between the United States of America and Canada on Great Lakes Water Quality provide a vital framework for binational consultation and cooperative action to restore, protect and enhance the water quality of

the Great Lakes to promote the ecological health of the Great Lakes Basin” (US and Canada, 2012). This vision of binationalism is reflected throughout the wording of the Protocol, from the reaffirmation of commitment to the Boundary Waters Treaty of 1909 to the inclusive definition of State and Provincial Government to the specification of that the Parties agree to maximize efforts to cooperate and collaborate in the Purpose of the Agreement.

### *Contemporary Focus*

The Protocol includes contemporary concepts in Article 2, clause 4, Principles and approaches. The concept of a systematic process of adaptive management has been included. This is forward looking as there was no mention of this concept in the 1987 Protocol. The Protocol also includes concepts from the *Rio Declaration on Environment and Development* such as “polluter pays” and the “precautionary approach”. This is a signal that the Protocol is cognizant of the wider environment and has incorporated contemporary principles from international proceedings.

### *Broadened Scope -New Annexes*

The Protocol heeded the calls of the public and the IJC to incorporate previously unaddressed issues such as climate change with the inclusion of three new annexes; climate change, habitat and species and aquatic invasive species. It was recognized in the introduction that the Protocol is placing emphasis on addressing new and emerging threats to the waters of the Great Lakes.

### *Indigenous People Involvement*

The need for involvement of indigenous people was articulated by the Great Lakes Science Advisory Board (SAB) in the 1997-1999 Priorities report and reiterated in the 2003-2005 Priorities Report (IJC, 2006). The SAB issued a call to that the Parties be briefed on the importance of traditional ecological knowledge and for mechanisms to be put in place to facilitate contribution of this knowledge by the aboriginal people (IJC, 2006). Perhaps heeding this call, for the first time the Protocol included the involvement of the First Nations, Metis and Tribes of America. This is articulated in the introduction which recognized that while governments are responsible for decision making, the involvement of the First Nations, Tribal Government and Metis is essential. There is also a definition of Tribal Government in Article 1-Definitions, as the government of tribe recognized by either Canada or the United States and located in the Great Lakes Basin. The word ‘Tribal’ occurs 34 times in the Protocol, with zero mention in the 1987 version of the Agreement.

Indigenous persons’ involvement is also called for in the achievement of the Specific Objectives in Article 3, Clause B. More specifically, the Tribal Governments, First Nations and Metis are invited to have representation in the Great Lakes Executive Committee (GLEC), which is envisioned to help the Parties in achieving the purpose of the agreement thorough coordination and implementation of measures.

## *Relevant to Tar Sands Shipping*

Tar sands are a current emerging environmental issue as it grows in popularity among oil refiners for being a significantly cheaper source of crude oil. While crude petroleum shipped on the Great Lakes in 2011 was approximately 1% of the overall volume of Petroleum products shipped on the Great Lakes waterways (USACE, 2011), this figure is likely to increase. The United States and Canadian tar sands refineries are expecting to receive increased volumes of Canadian tar sands crude oil and shipping across the Great Lakes is one potential way of moving it out of these refineries. Calumet Specialty Products Partners L.P. (2013) issued a press release on its intent to ship tar sands crude across the Great Lakes by building a loading dock. According to Canadian pipeline builder Enbridge, the current pipeline transportation infrastructure is unable to transport the current supply to the markets (Draker, 2013).

As such, it is crucial that there are provisions for safe crude transport around the Great Lakes. Article 4 Clause 2a (V), talks of implementation of programs and other measures to pollution prevention, control and abatement programs for both onshore and offshore facilities, preventing discharge of harmful quantities of oil and hazardous polluting substances (US and Canada, 2012). Article 6 (c) speaks to notification of activities that could cause a pollution incident with significant cumulative impact such as oil and gas drilling and oil and gas pipelines. Annex 5 on Discharges from Vessels expounds in detail under subsection Discharges on the prevention of pollution from oil and Hazardous Polluting Substances. This Annex includes stipulations for regulations for vessel design to contain spills, retaining oily wastes, off-loading retained oily substances, hose and other appurtenances for loading and offloading and suitable lighting. These measures are all proactive as they range from notification of planned shipping activities to regulations to minimize the probability of discharges into the waters of the Great Lakes. However, it is noted that these measures do not pertain to pipelines, a very myopic omission.

## *Role of the International Joint Commission*

During the initial stages of the Agreement the International Joint Commission (IJC) was lauded for its efforts as visible improvements was seen in the Lakes. However, the 1987 Protocol brought many changes that affected the functioning of the IJC. The parties now met bi-yearly with each other and provided reports directly to the IJC, instead of through the WQB. The forming of the Binational Executive Committee (BEC) to carry out some of the functions previously undertaken by the WQB was seen as a retreat from the IJC

One of the strengths of the Protocol is in the clear depicting of the role of the IJC, which retains its oversight, public information and investigative roles. Article 7 clause k clearly outlines the triennial reporting requirement utilizing the Boards, to the parties. Further, Article 8 Clauses 3 and 4 speaks to the roles of the WQB and the Science Advisory Boards (SAB), The WQB is the principle policy advisor to the IJC assessing progress of the Parties while the SAB will provide advice on science and research matters. The shift from biennial to triennial reporting will allow the IJC time to gather and assess data and provide more comprehensive report. These changes will likely be welcomed by the Great Lakes Community who attributed the lack of comprehensive data

reporting that failed to document the true state of the Great Lakes ecosystem since the early 1990s as a direct result of the curtailed function of the IJC (CELA, 2006).

### *Nearshore Focus*

Traditionally, the Great Lakes Water Quality Agreement has had an offshore water quality focus. There were two mentions of the word nearshore in the 1987 Protocol, firstly in Annex 3, Clause 3 (b) which talks of phosphorous load reductions in 'various localized nearshore problem areas' and in Annex 11, Clause 3(b) which speaks to baseline data collection for whole lake including 'for nearshore areas (such as harbors and embayment, general shoreline and cladophora growth areas)'. However, there is increased recognition that nearshore areas need to be further included as part of an integrated approach to management. A consortium of over 200 Great Lakes Scientists agreed that the nearshore is critical as a buffer for stresses to the Great Lakes (Bails et al, 2005). Further, the IJC issued a call for the inclusion of the nearshore, focusing in on it in the 15<sup>th</sup> Biennial report (IJC, 2011) and in the 2009 workgroup report on the Nearshore Framework (IJC, 2009).

Heeding these calls, for the first time Annex 2, the Lakewide Management Annex of the Protocol, issues a call for an Integrated Nearshore Framework (Nearshore Framework). The word nearshore appears with a frequency of 16, a 400% increase from the 1987 Protocol. Clause 7, Annex 2 calls for the implementation of the Nearshore Framework through the Lakewide Management process of each lake. It calls for an assessment of the state of nearshore waters, identification of highly stressed nearshore areas, determination of stressors, identification of high ecological value nearshore areas, engagement of restoration and protection agencies, consideration of human health and the environment, consideration of shoreline hardening, non- point source runoff and monitoring at a frequency determined by the Parties. It also calls for regular assessment and revision "as appropriate". The definition of "the Waters of the Great Lakes" specifies the waters of all the five Great Lakes, the river systems and now includes "all open and nearshore waters" (Canada and US, 2012).

### *Review and Amendment*

The Protocol retains the need for review following the IJC's third Assessment of Progress Report. However, the timeframe is longer as it is following the third triennial report, not biennial as in the 1987 Protocol. This longer time frame can be seen as a strength that it will allow for a more comprehensive review, and allow for a more forward looking agreement that incorporates longer future time frames. Article 5, Clause 4 that speaks to the review also stipulates that the Parties will determine the scope and nature of the review but will take into account the views of the Indigenous people, public, municipalities, State and provincial governments.

### *Public Participation*

The Protocol does allow for a strong role of the public in Great Lakes Activities, with four instances of public input in the language as contrasted to none in the 1987 Protocol. The Parties are urged to seek public input in the implementation of the Agreement under Article 4. Additionally, Article 5 stipulates a formal requirement for both

the Parties and the IJC to convene a Great Lakes Public Forum within one year of entry of force of the Protocol and triennially thereafter and to have representation from the broader public in the Great Lakes Executive Committee. This is a step forward as it allows both the Commission and the Parties to solicit and discuss public input at a common forum. One of the roles of the IJC under Article 7 is to incorporate public input on the Progress report of the Parties in the triennial reports, lengthening the period from the biennial stipulation in the previous agreement. This facilitates the involvement of the public in the assessment of programs and other measures of the Agreement.

The Protocol does not stipulate the extent of the engagement. It is hoped that the public will be able to participate in all stages of the review process, including the renegotiation that was characteristic of the 1987 Protocol and missing in the renegotiation of the 2012 Protocol. Both Parties can utilize innovative mechanisms like the Stakeholder Advisory Panel that assisted the Canadian mediators during the negotiations of the 2012 Protocol. It is recommended that the webinars, teleconferences and social media be used by the IJC and the Parties to engage those who cannot attend meetings and also to engage youth in Great Lakes events.

## **Weaknesses of the Great Lakes Water Quality Protocol 2012**

### *Ambiguous language of the Agreement*

There is ambiguous language in many parts of the Protocol. In Annex 5, Discharge from Vessels, Clause 6 (b) on ballast water speaks to undertaking scientific and economic analysis on risks, ballast water management systems and technologies and approaches “when appropriate”. There is no indication of what constitutes the appropriate time for such analyses. There were 21 uses of the term “as appropriate” with no indication of what constitutes relevance. The Protocol includes stipulations to incorporate public opinion and advice “as appropriate”, adopt virtual elimination “as appropriate”, use the philosophy of zero discharge “as appropriate”, develop lake ecosystem objectives for temperature, pH....”as appropriate”, develop substance objectives.....”as appropriate”. These are only some examples of the 21 instances of the use of the term “as appropriate”. This leaves the question of who will determine what appropriate action is and how the public will be consulted in such determinations.

### *Lack of clarification of what’s feasible for Aquatic Invasive Program*

The purpose of Annex 6, the annex on aquatic invasive species speaks to the contribution of the general and specific objectives through the establishment of a binational strategy for the prevention, control or reduction and eradication, “where feasible” of existing AIS in the Great Lakes Basin. There is no clarification of the determinants of what is feasible in this case. This Annex also stipulates the development and implementation of introductions of AIS by using ‘risk’ assessments to inform a binational prevention based approach. It also goes on to say that new species can pose a ‘risk’. There is no clarification of what constitutes risk.

### *Lack of Gap Analysis for all annexes*

The Protocol issues a call for gap analysis in Annex 7, Habitat and Species and Annex 8, Groundwater. For Habitat and Species, the requirement is to assess gaps for programs in habitat and species as a first stage of the development of a binational framework for prioritizing activities. In the annex on groundwater, a gap analysis is required for information and science needs. One wonders why the gap analysis is only reserved for these two Annexes and not applied more broadly to other annexes including chemicals of mutual concern, science and Aquatic Invasive Species. These gap analyses should be followed by a detailed implementation plan.

### *Inconsistent referencing on Impact on Human Health*

While the Protocol focuses on human health, it is not consistently carried through to all the Annexes. There is no specific mention of impact on human health in Annex 1, Areas of Concern even though some of the Beneficial Use Impairments (BUIs) have a potential direct impact on human health. BUIs such as restrictions on fish and wildlife consumption, tainting of fish and wildlife flavor, eutrophication or undesirable algae, restrictions on drinking water consumption and beach closings have a direct human health impact. Additionally, Annexes 6 through 10 has no direct mention of the impact on human health. This is a concern as it can lead to a lack of focus on this issue in the implementation of these Annexes.

### *Separate Treatment of Groundwater*

While the scope of the Protocol has been broadened to include nearshore waters, the definition of waters of the Great Lakes does not include a mention of the groundwater. In Article 1, Definitions, "Waters of the Great Lakes" is defined as the waters of the lakes and the connecting river systems and open and nearshore waters. However, Annex 8 on groundwater recognizes "the interconnection between groundwater and the Waters of the Great Lakes.." in Clause C. This separate treatment of groundwater throughout the Protocol can lead to the exclusion of groundwater in implementation actions and can also lead to increased costs and confusion through replicating of actions for components of the ecosystem that are interconnected. This separation of ground and surface water can also be a deterrent for participation from the Indigenous Community of Tribal and First Nations, Metis who view the environment in a holistic and interconnected manner.

### *No Annex on Contaminated sediment and dredging*

The Annex on Contaminated Sediments, Annex 14 and the Annex on Dredging, Annex 7 of the 1987 Protocol was dropped in the 2012 Protocol. The word 'sediment' occurred 38 times in the 1987 Protocol while its frequency decreased to 7 in the 2012 version.

Contaminants in sediment continue to be of concern as they can be a source of toxic chemicals that can perpetuate up the food chain. Since the introduction of Remedial Action Plans in the 1987 Protocol, 28 years of effort has gone into work on contaminated sediment as they impair beneficial uses in all of the Areas of concern. While there were significant declines between 1970 and 1990s in PCBs, DDT, lead and mercury in sediment, it is unclear if that trend continued as the emphasis was shifted to chemicals of

emerging concern such as brominated flame retardants and perfluoralkylated substances, due to their potential to harm the health and environment (IJC, 2013).

The USEPA has recently published a list of over 80 contaminated sediment sites in the Great Lakes, with only 27 being completely remediated (USEDPA, 2013). The lack of profile of contaminated sediment in the 2012 Protocol is a weakness of the Protocol.

#### *No Clear Definition of Nearshore*

While the inclusion of the nearshore areas of the Great Lakes is strength of the Protocol, the lack of a clear definition of what constitutes nearshore waters can be detrimental to successful planning and development of the nearshore waters as there may be varying understanding of the geographic bounds of the nearshore. Near shore areas have been defined by the IJC (2011) as extending 16 km in both land and water directions. This definition is neither hydrological nor ecologically defensible as it appears to be based on convenience and approximation. Edsall and Charlton (1997) uses hydrology to define nearshore waters as beginning at the shoreline or lakeward edge of the coastal wetland and extending offshore to the deepest lakebed depth contour where the thermocline typically intersects with the lakebed in the late summer or early fall. According to their definition, for Lake Superior nearshore waters are between shoreline and 9-m depth contour, while in the other four lakes, the nearshore waters are between shoreline and 27-m depth contour. Nearshore has also been defined as areas encompassed by water depths generally less than 15 m (Mackey, 2009a). Mackey (2009b) further defined nearshore areas to include higher energy coastal margin areas and lower energy open water areas. The concept of coastal zone can be used in the definition nearshore areas. An advantage of this would be the ability to learn and benchmark from other Coastal Zone Management programs in North America and around the world.

Successful implementation of Annex 2 requires that a definition of the nearshore be clarified and adopted. It also needs a clarification of what the near shore framework is for; a framework for monitoring, science, governance, other?

#### *Confusing Overlaps on nearshore areas in the Annexes*

Annex 2 on Lakewide Management devotes clause 7 to the development of an integrated nearshore framework. This clause specifies what should be considered under this framework. However, this list seemed incomplete as the nearshore is also addressed in Annex 4, Nutrients, under the setting of substance objectives. Clause C (2) in this Nutrients Annex talks about developing substance objectives and load reduction targets for phosphorous for the nearshore waters of the Great Lakes. This separate referencing of the nearshore could lead to disjointed efforts and confusion of different sub-committees roles during the implementation process. Similarly Annex 8, Groundwater, acknowledges the connection of groundwater to the waters of the Great Lakes (which includes nearshore waters). Again, this separation can lead to implementation challenges.

#### *Lack of clarity on dispute resolution within the committees of GLEC*

The Great Lakes Executive Committee (GLEC) is established in Article 5 which states that the Parties will serve as co-chairs and invite wide representation from the



Indigenous population, Federal Governments, State and Provincial Governments, Municipalities, watershed agencies and other public agencies. While all these stakeholders have a seat at the table, it is clear from Clause 2 (d) under this Article that the US and Canada hold decision making power in their hands; this clause states that the Parties shall establish priorities 'in consultation' with the GLEC. This can be interpreted as the Parties in the form of the two co-chairs will make the final decision on GLEC matters, despite the viewpoint of the majority members. This can prove detrimental to the restoration process and act as a demotivation to GLEC members to participate in the future.

#### *Discrepancy between Principles and Annex*

The Protocol incorporates a number of principles and approaches in Article 2, Clause 4. This section speaks to accountability in reporting, anti-degradation, coordination, the precautionary principle and polluter pays. While it is good that these measures are included, there is often not a follow through on how they will be incorporated in the programs described in the Annex. For example, clause 4(h) on "polluter pay" is visionary in incorporating this principle of the Rio Declaration on Environment and Development where "the polluter should, in principle, bear the cost of the pollution". However, there is no carrying through of this principle in the Annexes. For example, Annex 3 Clause 4 on Chemicals of mutual concern states that "the Public can contribute to achieving reductions of the environmental impact of chemicals of mutual concern by using safer and less harmful chemicals and adopting technologies that reduce or eliminate the uses and releases of chemicals of mutual concern" (US and Canada, 2012, pp27). In using the word 'can' this gives manufacturers and industry the option of contributing to the reduction of harmful impacts of chemicals, whereas the incorporation of the 'polluter' pays holds them accountable through monetary measures.

#### *No Annex on Indigenous Engagement*

For the very first time, the Protocol contains specific references for the involvement of the Indigenous population including First Nations, Tribal Organizations and Metis. One can argue that since this indigenous population are the first people of North America, that in any reference to them, they should precede other groups such as the government. This is not the case in the Protocol. Since there is no history of Indigenous engagement in the Protocol, there should have been an Annex on developing an engagement protocol for the first nations. Water ethics demands that Indigenous engagement is approached in a manner that is respectful of their culture and empowers them at the negotiating table. The Indigenous culture and spirituality depends on healthy water and ecosystem while the ecosystem health depends on their spiritual practices, in a mutual symbiotic relationship (Groenfeldt, 2013). The Indigenous culture relating to water presents several water challenges; indigenous cultural views about water are often misunderstood and ignored, indigenous communities are rarely given meaningful opportunities to participate in policy and planning, customary access and rights are seldom recognized nationally, water bodies that are critical to cultural well-being are polluted (Groenfeldt, 2013). These challenges are all applicable to the Great Lakes Region. An Annex on Indigenous engagement would help in developing an engagement strategy that would recognize the Indigenous Rights to Water. These rights were formally recognized globally

in the 2007 UN Declaration of the Rights of Indigenous Peoples (DRIP (UN, 2008). An Annex on Indigenous engagement would have been in keeping with the vision of DRIP.

## **Opportunities for the Great Lakes Water Quality Protocol 2012**

### *Right to Water*

On July 28, 2010 the United Nations General Assembly formally recognized the human right to safe and clean drinking water and sanitation as “essential for the full enjoyment of the right to life” (UN Human Rights, 2013). The UN Human Rights Council adopted a second resolution two months later affirming that water and sanitation are human rights which is derived from the right to an adequate standard of living. The UN Human Rights Council further declared that the human right to water and sanitation is “inextricably related to the right to the highest attainable standard of physical and mental health as well as the right to life and human dignity” (UN Human Rights, 2013). As members of the United Nations, both US and Canada are obligated to prepare an action plan for the realization of the right to water. This action plan must outline how they will meet the three obligations inherent in a human right; the obligation to respect, the obligation to protect and the obligation to fulfill. The obligation to protect presents an opportunity for the Great Lakes. Under this obligation, both US and Canada are obligated to prevent third parties from interfering with the right to water and sanitation, through actions such as preventing pollution and extraction of water by the private sector. The Great Lakes water quality agreement can harness this right in the protection of the waters of the Great Lakes, which is a source of drinking water to so many North Americans.

### *Legal Mechanisms to Incorporate the Protocol*

Both the United States and Canada have existing legal mechanisms that enshrine parts of the Protocol in cooperative Agreements and law. For example, Canada has relied on the Canadian-Ontario Agreement as a mechanism for cooperation between the Province of Ontario and the federal government for Great Lakes Restoration. According to the Ontario Ministry of Environment Website (2013), the Province of Ontario is working on the proposed Great Lakes Protection Act which has the potential to provide tools for setting broad direction for ecological restoration as well as accommodating targeted action in priority degraded areas. Similarly the US has recognized the Great Lakes Water Quality Agreement in the Clean Water Act, the Beaches Act, the Great Lakes Restoration Initiative (GLRI) and several Executive Orders of its Presidents. These are visionary precedents that can aid in the implementation of the Protocol.

### *North American Free Trade Agreement Environmental Committee*

The North American Free Trade Agreement (NAFTA) came into force on January 1, 1994 and was accompanied in the same year by the North American Agreement on Environmental Cooperation (NAAEC), which was designed to facilitate cooperation on environmental protection by the three countries. A Commission for Environmental Cooperation (CEC) was established as an intergovernmental organization to facilitate this

cooperation on environmental matters, to ensure implementation of environmental legislation and for dispute resolution. The CEC receives financial support from all three countries and comprises of cabinet level representation from each country on a governing Council. (CEC, 2013).

The CEC presents an opportunity for the Great Lakes Water Quality Agreement as it is an established organization working on matters that will have an impact on the Great Lakes Region. For example, in the area of chemicals management, the CEC has a Sound Management of Chemicals (SMOC) initiative which is a collaborator initiative for the comprehensive life cycle management of a range of chemicals of mutual concern. The CEC has already identified chemicals of mutual concern such as pesticide, DDT, lindane, mercury, dioxins, furans and flame retardants such as polybrominated diphenyl ethers (PBDEs). A partnership between the CEC and the GLEC can inform the implementation of the Annexes and prevent the fragmentation and duplication of efforts in protecting the waters of the Great Lakes.

### *The Canada-European Union (EU) Comprehensive Economic and Trade Agreement (CETA)*

The Canada-European Union (EU) Comprehensive Economic and Trade Agreement (CETA) was agreed in principle on October 13, 2013 (CETA, 2013). This is a comprehensive trade agreement between Canada and the EU that has the potential to boost trade and investment between the two regions that share some of the world's shared water basins. As such, CETA can be seen as an opportunity to benchmark from the regulatory and technological practices through partnerships centered around regulatory cooperation for freshwater protection, shared experiences under the EU Water Framework directive and the Protocol, learn from the implementation of adaptive management in transboundary basins such as the Danube and foster technological innovation through centers such as Ontario Water Innovation Centre. The desire to harness the market potential in the EU may for Canadian producers to adopt cleaner, more environmentally sustainable practices such as no or reduced tillage on farms.

### *New Partnerships*

Since the original Agreement, groups have coalesced around common interests around Great Lakes restoration. Some of these groups contain experts and activists who have dedicated their lives to Great Lakes work. There are two new partnerships that afford the opportunity to engage these experts and also allow the capacity building of a newer generation of Great Lakes researchers and advocates. They are the Great Lakes Futures Project and the Great Lakes Policy Research Network. According to the Great Lakes Futures Project Website (2013), it is an inaugural project of the Trans border University Network (TRUN) for water stewardship that assessed past and potential future states of the Great-Lakes St. Lawrence River Basin that aims to inform policy through visioning alternative futures. The Futures project also aimed to train future Great Lakes leaders through their involvement in the research. The Great Lakes Policy Research Network, a collaborative of researchers, practitioners, and graduate students in Canada and the US documents on their website (2013) their goal as improving policy outcomes through the engagement of government, non-governmental, private sector, community organizations in the creation of new knowledge through transboundary research projects. This

represents a ready pool of resources that can be harnessed in the implementation of the Protocol.

### *Funding Sources*

There are various funding sources that can be harnessed for the restoration of the Great Lakes. The Great Lakes Restoration Initiative is one example of this. This was the elections campaigning promise of President Obama that came to fruition in 2010. Similarly, Canada has a Great Lakes Sustainability Fund (GLSF) that began in 2000 as part of the Great Lakes Program's Great Lakes Basin 2020 Action Plan. According to the Environment Canada website, the GLSF will continue until March 2015. It should be noted that the GLSF is limited to the delisting of the Areas of Concern (AOC). Ontario has also launched the Great Lakes Guardian Community Fund with the aim of engaging communities in protecting their corner of the Great Lakes.

### *Engaged Community Groups*

There are many community based organizations that are engaged in Great Lakes efforts and also many existing that are not yet part of the restoration efforts. Some Indigenous Organizations are not yet part of the restoration efforts. Organizations such as Chiefs of Ontario and Provincial Territorial Organizations can be engaged in restoration efforts. The Watershed Organizations in the United States and the Conservation Authorities in Canada already has stewardship programs with communities and can be called upon to lead the community engagement efforts.

### *Experienced Great Lakes Experts and staff*

There is an experienced pool of Great Lakes Experts and staff still working on Great Lakes issues. The Great Lakes Policy Research Network has compiled list of policy experts as part of the project. There is also an expert directory on the International Association of Great Lakes Research (IAGLR) website (2014). These persons represent a ready pool of experienced, committed individuals who are available to work on the implementation of the Protocol. The US Environmental Protection Agency and Environment Canada are staffed with personnel with over a decade of Great Lakes expertise. These persons will be engaged in the implementation of the Protocol as part of the Great Lakes Executive Committee (GLEC).

## **Threats to the Great Lakes Water Quality Protocol 2012**

### *The Canada-European Union (EU) Comprehensive Economic and Trade Agreement (CETA)*

The Canada-European Union (EU) comprehensive Economic and Trade Agreement (CETA) can also be a threat to the Great Lakes if it is used only for profit maximization. Some of the key partnership sectors include agriculture and agrifood, manufacturing, food, fish and seafood and chemicals and plastics. According to Canada's CETA website (2013), an average of \$2.5 billion was earned by agricultural exports during 2010-2012, with average tariffs of 13.9 percent. When CETA is entered into force there is likely to be increased production of crops that no longer carry a tariff; (CETA, 2013).

This increased production of agricultural products will likely have a negative environmental impact on the waters of the Great Lakes. According to the EU-Sustainability Impact Assessment Report (EU-SIA Report) (EU, 2011), under the full removal of tariffs scenario, the concomitant changes in demand will affect land and water usage and quality, waste creation, biodiversity and air pollution. This raises the question of how well positioned are relevant annexes in the protocol, such as nutrients, chemicals of emerging concern, habitat and species positioned to counteract these potential threats.

#### *Lack of Resources for Implementation*

In Article 4, clause 3, on implementation, the parties committed themselves to the appropriation of funds for implementation and for the IJC to carry out its activities. Further, Article 4 Clause 5 further expounds on this for US and Canada by qualifying their obligations as being subjected to the “appropriation of funds in accordance with their respective constitutional procedures”. As was seen in the past, the lack of funding was one of the key weaknesses in the ability to implement restoration work.

While there are funding initiatives in both Canada and the United States, these have been steadily declining. In Canada, funding was allocated from 1989-2012 under the Great Lakes Action Plan, a federal funding commitment to implement the Federal Great Lakes Program and to honor commitments under the Great Lakes Water Quality Agreement. This funding commitment of \$8 million dollars over five years, with annual allocation of \$50M ceased in 2012. The Canadian Ontario Agreement (COA) also expired in 2012, so there has been no new commitment of funds as there has not been a new COA. On the US side, President Obama’s Great Lakes Restoration Initiative (GLRI) funding commenced in 2010 with an initial total commitment of \$2.2 billion for the five years (Sheikh, 2013). However, on July 23, 2013 a bill was approved by the US House of Representatives subcommittee that cut funding for 2014 by 80%, down from a proposed \$285 million to \$60 million (Michigan Radio Newsroom, 2013).

This represents a growing funding gap for what is required for restoration of the Great Lakes.

#### *Fragmented Nongovernmental Organizations - Closing of Great Lakes United*

The growing sense of community of Great Lakes Non-Governmental Organizations is widely captured in the literature. This culminated in a bi-national citizen Organization, the Great Lakes United (GLU) formed thirty years ago and dissolved in 2013 due to lack of funds (Elder, 2013). The political influence of this bi-national force grew as the GLU was able to harness the public’s opinion and represent their interest. The GLU conducted meetings with the public and reported their views in “Unfulfilled Promises: A citizen’s Review of the International Great Lakes Water Quality Agreement”, recording criticisms for the conflict of interest in Water Quality Board members and highlighting how the lack of funding impeded implementation (Botts and Muldoon, 2005). The closure of this bi-national group is a threat to the implementation of the Protocol.

#### *Poor Governance*

Much has been written on the poor governance in the Great Lakes (Botts and Muldoon, 2005; Manno and Krantzberg, 2008; Bails et al, 2005). Elements of this poor governance include fragmented institutions, poor accountability and transparency, lack of governance capacity including the resources for restoration of degraded areas and lack of public participation. This could prove one of the biggest stumbling blocks in the implementation of the Protocol.

### **SWOT Summary Table**

A summary of the results found in the SWOT analysis is found in Table 4. As can be seen from Table 4, there are numerous strengths of the Great Lakes Water Quality Protocol 2012. However, weaknesses internal to the environment of the Agreement and threats in the external environment can impede the implementation process. By being cognizant of these threats, policy makers can harness the opportunities in the external environment to aid in the implementation of the Protocol.

Table 4: Results of the SWOT analysis of the Great Lakes Water Quality Protocol 2012

<p>Strengths (S)</p> <ul style="list-style-type: none"> <li>• Visionary Purpose</li> <li>• Binationalism</li> <li>• Contemporary Focus</li> <li>• Broadened Scope</li> <li>• Indigenous Involvement</li> <li>• Relevant to Tar Sands</li> <li>• Clear Role of the IJC</li> <li>• Nearshore Focus</li> <li>• Review and Amendment</li> <li>• Public Participation through GLEC</li> </ul>	<p>Weaknesses (W)</p> <ul style="list-style-type: none"> <li>• Ambiguous Language</li> <li>• Lack of clarification of what's feasible</li> <li>• Lack of gap analysis for all annexes</li> <li>• Inconsistent referencing of impact on human health</li> <li>• Separate treatment of Groundwater</li> <li>• No Annex on Contaminated sediment and dredging</li> <li>• No clear definition of the Nearshore</li> <li>• Confusing overlaps on nearshore areas in the Annexes</li> <li>• Lack of dispute resolution process for GLEC</li> <li>• Discrepancy between principles and annexes</li> <li>• No Annex on Indigenous engagement</li> </ul>
<p>Opportunities (O)</p> <ul style="list-style-type: none"> <li>• Right to water</li> <li>• Local Legal Mechanisms</li> <li>• NAFTA CEC</li> <li>• CETA</li> <li>• New Partnerships</li> <li>• Funding Sources</li> <li>• Engaged Community Groups</li> <li>• Experienced Great Lakes Experts and staff</li> <li>• Great Lakes Human Health Effects Program</li> </ul>	<p>Threats (T)</p> <ul style="list-style-type: none"> <li>• CETA</li> <li>• Lack of resources including political will</li> <li>• Fragmented NGOs – folding of GLU</li> <li>• Poor Governance</li> </ul>

## **Conclusion**

Overall, the Protocol represents a renewed call and commitment to the restoration of the waters of the Great Lakes ecosystem. It retains the original purpose to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes while expanding to encompass new threats in both revised annexes and three completely new ones: Aquatic Invasive Species, Habitat and Species and Climate Change. This protocol has retained the spirit of binationalism of the original Agreement and has expanded to include participation of the public including the Indigenous Community including the First Nations, Metis and Tribal leaders, with accommodations for representation on the Great Lakes Executive Committee. The public is also allowed participation through the triennial Great Lakes Public Forum.

The SWOT analysis of the protocol reveals many strengths and weaknesses that are internal to the Protocol and Opportunities and Threats in the external environment. It is envisioned that this SWOT analysis will prove useful for implementation of the Protocol by inviting decision makers to consider important aspects of the internal and external aspects of the Protocol.



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