

Water Use and Ecosystem Restoration

An Agenda for the Great Lakes and St. Lawrence River Basin

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Summary

Water defines the world for people who live in the Great Lakes and St. Lawrence River basin.

Water is the economic, recreational, and spiritual basis of human society here. Water is the foundation of the region's fish, plant, and wildlife communities.

But the basin water system is in danger. Climate change, diversion and export proposals, and industrial, agricultural, and municipal misuse all threaten the source of our culture, our well-being, and the well-being of the living things around us.

Fortunately, news of threats to the lakes has galvanized both public opinion and government interest in better protecting the region's waters. Basin political leaders have begun to act. The U.S. and Canadian federal governments asked the International Joint Commission to write a comprehensive report on protecting Great Lakes waters, which was delivered in March 2000. Ontario, Québec, and Minnesota are developing strategies for managing water use. The Great Lakes provinces and states have been meeting and will soon put forward a collective plan to reform basin water use practices.

The public has a crucial role to play in this process: We must insist that new solutions for sustaining water for future generations *fully* protect *and* restore the already heavily damaged basin water system. To do this, reform projects must address *all* the many changes people cause in the natural state of water, from exporting it for drinking to draining wetlands for development and damming streams for electricity.

This document recommends a comprehensive set of reforms based on specific environmental protection and restoration objectives. These recommendations—environmental “must haves” for any reform project to succeed—can distinguish proposed approaches that lead to sustainable use of Great Lakes waters from those that push the region further down the spiral of non-sustainable water use.

In brief, these recommendations are:

1. The federal, tribal, state and provincial governments should place a moratorium on new or increased water uses, diversions, and other changes to the Great Lakes and St. Lawrence River water system, until a comprehensive conservation and ecosystem restoration strategy has been developed and implemented in legislation and permitting
2. The goal of the strategy must be to protect *and* affirmatively restore the basin water system, not just fend off additional harm
3. A central objective of the strategy must be substantial reductions in basin water consumption and use
4. The comprehensive conservation and restoration strategy must:
 - Address *all* changes to the Great Lakes and St. Lawrence River water system. Managing solely for how much water is used while neglecting, for example, how and where it moves, will not protect water for the benefit of all users, including non-human users
 - Provide specific, binational protection and restoration goals for the basin water system

- Include a basin-wide standard to be applied to all decisions on proposed new water uses or alterations of the water system
 - Be conservation-based, that is, based on protecting and restoring the basin water system as opposed to accommodating and mediating the wasteful needs of use sectors
 - Set conservation targets by use sectors with timelines
 - Take a watershed approach to system protection and restoration by encouraging living within the means of individual watersheds, defined as no larger than major river watersheds
 - Prohibit new diversions of water between watersheds
 - Embody the precautionary principle: use conservative approaches in the absence of perfect information about the needs of the water system
5. The public must have full access to the process for developing and implementing both the basin-wide conservation and restoration strategy and the standard for making decisions on proposed water uses and alterations
 6. All water use and alteration decisions must be subject to challenge by citizens
 7. The process for developing and implementing the strategy and standard must be guided by the region's state, provincial and tribal governments, but it must also respect and accommodate the legitimate role of the federal governments: overseeing the national and international interest in protecting and restoring the basin water system
 8. The federal governments must assure the availability of a constitutionally valid mechanism that enables vigorous international, tribal, provincial and state cooperation
 9. Should state, local and tribal governments fail to create a strategy, the federal governments should step in to assure that a strategy is created
 10. The onus must rest with those proposing new or increased water uses or alterations to the water system to show that they are consistent with the strategy and standard
 11. Information on the connection between the basin water system and the life it supports should be continuously and aggressively gathered and assimilated into a publicly accessible, binational water information base that is understandable and useful to lay citizens
 12. Regional climate change should be aggressively researched and climate change data evaluated with water data to routinely review the estimated impacts of climate change on basin water quantities and movement
 13. The effects of all approved water uses must be monitored for periodic evaluation of the uses against the standard and strategy, and to inform future water use decisions. This monitoring information should be included in the binational water information base
 14. Water use approvals must be rescindable if evidence later arises that they are no longer, or never were, consistent with the strategy and standard
 15. Every individual's right to water for basic human needs—drinking, cooking, and bathing—must be guaranteed

Introduction

In the Great Lakes region and throughout the globe, the quantity and movement of available water have fundamental impacts on the well-being of plant, fish, wildlife and human communities. When the amount and movement of water in a region is altered, the life that depends on that water is changed, sometimes in ways that threaten its very existence.

Although the Great Lakes and the St. Lawrence River seem vast and powerful, they are in delicate balance with the climate and watersheds that support them. Unfortunately, both climate and watershed functioning are undergoing significant alteration by human beings, with much more such alteration to come if the region does not reform its water use system.

Increasingly reliable projections of climate change effects on the Great Lakes indicate a possible two-foot drop in average water levels within thirty years. U.S. national population and economic trends point to long-term water shortages in the South and Southwest. With 20 percent of the world's fresh water and 95 percent of North America's fresh water, in the long term the Great Lakes region is a predictable target for slaking continental and global thirsts.

The unceasing rise in world population and per-capita water consumption poses serious threats to both the human and non-human life that depends on fresh water. By 2025, up to two-thirds of the world's population will face water shortages and several observers have predicted that water will be a major factor in international politics by mid-century. Waters the world over are already being diverted, exported and shipped to thirsty areas, sometimes with disastrous consequences for local ecologies and people. A large world commercial water market could be realized soon. A company is shipping water out of Norway by towing it in large fabric bags across the ocean to Cyprus. A Canadian company wishes to export water from a Newfoundland lake to the Middle East by tanker. Another Canadian company is nearing completion of plans to ship Alaskan water to China. In October 1999 the Sunbelt Corporation of California filed a \$10.5 billion claim under the North American Free Trade Agreement over a failed plan to ship water from British Columbia to California.

Trade in water

In 1998 an obscure private company sought, and the province of Ontario granted and then cancelled, a permit to export Lake Superior water to Asia. The abortive proposal was never financially viable, but it pointed up a trend: private water markets may eventually play a role in future water politics. Water services companies have grown rapidly in the last five years, raising large amounts of capital, acquiring firms in related industries, merging into powerful conglomerates and attaining multinational status. International trade agreements created or updated during the 1990s will facilitate the growth of world trade in water, because they define water as a commodity, may apply to water in its natural state, and have much stronger enforcement provisions than previous agreements. Legal analyses assessing these new trade pacts have suggested that the Great Lakes and St. Lawrence River region is vulnerable to proposals to divert and export water out of the basin in large quantities.

Misuse of water

Meanwhile, over the decades, the many governments and private institutions and citizens of the Great Lakes basin have been misusing water because it is so abundant. The region's agricultural producers employ wasteful irrigation practices. The region's towns, cities, counties, and regional townships often fail to repair substantially leaking drinking water supply systems. The region's industries commonly fail to even consider techniques for reducing their often large water use requirements. The

region's governments do not vigorously promote conservation by institutional and individual users. Sprawling development engenders ever wilder schemes for moving water.

In general, the region's governments have not sufficiently carried out their responsibilities for properly caring for water, from common law "public trust" responsibilities to treaty requirements for protecting for tribal waters.

Given the growing global water crisis, we in the Great Lakes and St. Lawrence River region must now address our own misuse of water. We have already made many changes in the amount and movement of basin waters without fully understanding the wide range of effects these changes will cause. We have dammed and redirected streams and rivers, paved over groundwater recharge areas, drained wetlands, extracted and contaminated groundwater, tried to control lake levels, and are consuming water at twice the rates of other industrialized nations.

The damage we cause

In the medium term, damage to the basin ecosystem is more likely to occur from the cumulative effect of our many smaller water uses and alterations of flows than from large-scale diversions or other water removals. The numerous cumulative impacts of these activities include:

- Drying out or altering water movement in streams and wetlands so that habitat is effectively destroyed for many species of plant and wildlife
- Lowering groundwater levels, causing dry wells for farmers and communities and causing poorly understood effects on surface waters and the biotic communities they support
- Accelerating runoff and soil erosion and therefore the need for expensive and disruptive dredging to keep commercial and recreational activities viable
- Disrupting the cultures of water-centred communities, especially tribal communities
- Adding to, concentrating and re-releasing contaminants in water

In the future, human activities may result in even greater changes in Great Lakes and St. Lawrence River water levels and flows, and consequently greater threats to the well-being of basin life. These threats include:

- Human-induced climate change, which is predicted to result in a substantial drop of up to two feet, or more than half a meter, in the average water levels in the Great Lakes and St. Lawrence River basin
- Sprawling basin and near-basin housing and commercial development that creates inefficient demands for water, disrupts natural water flows, and induces searches for water far beyond community boundaries
- Basin agriculture, whose practices lose 70 percent or more of irrigation water to evaporation
- Companies that envision selling water or facilitating the movement of water from the Great Lakes and St. Lawrence River basin to the Mississippi River basin, the south and southwestern United States, and the Middle East
- Severe water shortages in other parts of the continent and the world, which in the long term may result not only in export schemes but also in an influx of people and industry to the region because of its abundant water supplies. Unless substantial changes are made in the way basin communities control development, this population shift will result in substantially increased stresses on basin waters

What needs to be done

We do not have adequate regional mechanisms to prevent and correct the problems caused by these activities. Basin jurisdictional coordination is inadequate and decisions are made without taking into account their cumulative and long-term impact on all basin life. Our actions are not guided by an overarching strategy or plan. We do not have an understanding and ethic that recognises the value of conserving and restoring the waters of the Great Lakes and St. Lawrence River basin.

In its February 2000 report, *Protecting the Water of the Great Lakes*, the International Joint Commission notes that basin governments “should develop, with full public involvement and in an open process, the standards and the procedures” for considering water removals from the basin and major new or increased consumptive uses within the basin. The commission also says that the governments “should not authorize or permit any new removals and should exercise caution with respect to major new or increased consumptive use until such standards have been promulgated.”

Our Purpose

The current state of the waters of the Great Lakes and the St. Lawrence River basin is alarming. The lowest continuing water levels in thirty years, ongoing wasteful water use, and harmful alterations to natural flows all point to the need for a more effective regime to guide human water activities.

The purpose of this paper is to outline guiding principles for such a regime, and to help develop criteria for making decisions that could affect water quantity and movement. Our hope is that from this paper, and from discussions with U.S. and Canadian policy-makers addressing this challenge, our region will create a framework for protecting and restoring the waters for the benefit of people, plants, fish, wildlife, unique eco-communities and the ecosystem as a whole for generations to come. We see this as an opportunity to:

- Protect the Great Lakes and St. Lawrence River ecosystem from further disruption
- Improve water use so that natural flows in the Great Lakes and St. Lawrence River basin are restored

Based on these imperatives, it is clear that no form of human use or alteration of the natural water system should go unexamined. Therefore the principles and criteria we propose should be applied to:

- Both surface and ground waters
- All human activities that use, or change the movement of, the waters in the Great Lakes and St. Lawrence River basin
- All people and institutions that carry out such activities

Guiding Axioms

We assume three fundamental facts as the basis for our thinking:

- *All water is valuable.* Humans and all living things in the ecosystem need water to survive and they use water repeatedly. Water flowing from the ground or major rivers into the open lakes and out the St. Lawrence River is never going to waste. Removal of any water or disruption of its natural flow in any given place will ultimately affect species that depend on that water and its natural movement.

- *The waters of the Great Lakes and St. Lawrence River basin are finite.* Rain and snow, surface water runoff, and groundwater inflows renew only about 1 percent of the water in the Great Lakes each year. Scientists warn that this renewal rate may decline due to climate change.
- *The waters of the Great Lakes and St. Lawrence River basin underpin a single ecosystem.* Managing the region's waters comprehensively, according to the principles outlined in this document, is essential to preserving basin waters for the material and spiritual sustenance of future generations, and for the survival of the region's plants, fish, wildlife, and unique assemblages of life found in eco-communities such as coastal marshes.

Water Use Principles and Criteria

A. Human communities should live within the means of their watersheds

A central basis of water use management, especially on the state and provincial level, should be the principle that communities must live within the natural means of their local watersheds. The Great Lakes and St. Lawrence River basin is composed of a number of smaller watersheds. A basin-wide management regime must take into account the cumulative impact of water use within a local watershed as well as the larger issue of the non-natural movement of water from one local watershed to another, even if both watersheds lie within the basin boundaries.

As part of the principle of living within the means of one's watershed, communities should not degrade the functioning of their watersheds, that is, the way water enters, moves around, and leaves the watershed.

Most water uses and alterations of the water system are a result of development. Communities located in watersheds that are already using water unsustainably must reduce water use to sustainable levels before permitting further development. Communities located in watersheds where development is possible must plan for minimal impact on the workings of the water system. Industrial, agricultural and residential development should not be allowed to expand so that they require more water than is naturally available within the watershed, or to the point that they interfere with other use of the water, including use by plants, animals and unique assemblages of living things.

Governments should outline watershed boundaries and create water use management institutions to be implemented on a watershed and basin-wide basis. Watersheds should be as small as hydrologically practical, and no larger than major rivers. Overlap and linkages between various ground and surface watersheds should be clearly defined.

Decisions about proposals to remove water or alter its flow should be made in accordance with their scale. For example, the acceptability of a proposed use of water from a small stream should be judged according to the impact the use would have on that stream's watershed.

To implement the principle of living within the means of one's watershed, governments should prohibit non-natural transfers of water between watersheds. In those cases where non-natural interbasin transfers of water now occur, governments should phase out those transfers.

B. The precautionary principle should guide water use decisions and actions

A new management approach must recognize that our understanding of the complexity of the Great Lakes and St. Lawrence River ecosystem is limited and will undoubtedly evolve. Proposed water use

and water system alterations will inevitably have unknown impacts. Therefore we should use the precautionary principle—in the absence of certain knowledge, we should have a strong bias toward protection.

The assumption of the precautionary principle in water use management is that all water is used many times by living things in the ecosystem. Even if not readily apparent, using water or altering the water system will most likely harm some living thing. A precautionary approach implies a number of water management policies:

- No alteration of the basin water system should take place unless it is reversible. This means that we must ask ourselves: Can we repair any damage and return to previous conditions if we later discover that an action has unpredicted consequences?
- Any water use must be interruptible. That is, all permitting decisions must be renewed periodically. No permits should be permanent, and if new evidence of ecosystem damage comes to light, it must be possible to immediately reduce or end permitted water uses
- Water-use and alteration actions should be approved only on the basis of “reverse onus”: those wishing to take an action should be required to provide information to the public and decision-makers upon which to evaluate its impact. This information should include assessments of potential harm to the ecosystem and how the action can be reversed if unexpected damage occurs
- Cumulative effects of water uses and changes in the water system should be assessed and be the basis upon which decisions are made
- The bias in decision-making should be toward leaving water in the ecosystem in an undisturbed condition, and taking care of human needs by increased conservation, efficiency and other means

C. Restoration and protection of the ecosystem must be the outcome of a basin-wide water use management strategy

Any strategy decided on by the state, provincial and tribal governments for managing basin water use must provide specific binational protection and restoration goals for the Great Lakes and St. Lawrence River water system. The strategy must embody a commitment to the public and include the means for meeting these goals.

Permitted alterations of the water system’s flow or quantity must be consistent with the strategy. They should be approved only if they protect or restore the integrity of the watershed in which they are proposed. A definition of integrity should include the system’s natural functions, such as aquifer recharge, natural filtration and cleansing, base flow into rivers, meandering of rivers, and natural fluctuations of water levels.

In relatively pristine areas, human actions should not cause negative changes in the functioning of the water system, that is, in the quantity and flow of ground and surface waters. In degraded areas, any withdrawals or alterations in the system should contribute to a program of restoration of original functioning.

Opportunities for protecting and restoring the integrity of water systems include:

- Protecting and restoring critical or sensitive areas, such as wetlands, areas buffering lakes and streams, areas essential to support the full range of Great Lakes / St. Lawrence River

biodiversity including rare species and representative community types, and areas essential for groundwater and surface water recharge

- Reducing and relocating surfaces that are unable to absorb water
- Improving stormwater management to reduce runoff and ensure that it is released in ways that are not disruptive of normal functioning of the water system
- Removing dams throughout the Great Lakes and St. Lawrence River basin wherever physically and ecologically appropriate. Dam removals are often a large step forward in restoring the functioning of the basin water system
- Restoring water quality by preventing further contamination and cleaning up existing contaminated sites

D. Water conservation should be the primary method for meeting future human needs

Water conservation should increase dramatically. The rate of human water use should be substantially reduced from its current levels. Targets and timetables for reduction in water use should be set for each jurisdiction and use sector. Water conservation must be embraced and applied to all users, especially those that withdraw the most water. Three of the largest water consumption categories—industry, agriculture, and public water supply—must meet rigorous reduction targets. Industry can be motivated to reduce water use by removing pricing plans that charge lower rates to high-volume users. In many cases, industry can also conserve water through reuse, rather than continuous withdrawal and discharge. Efficiency in agriculture can be achieved through wise irrigation practices, like drip irrigation, rather than high-evaporation spraying. Public water supply can be made more efficient by fixing leaking systems, metering all water use, promoting use of water conservation devices, and pricing water no less than it costs to provide it, subject to guarantees that all people will have access to water for the basic human needs of drinking, cooking, and bathing.

States, provinces, and tribes should encourage a continuous reduction in net water use on a watershed-by-watershed basis. New uses should be accommodated by more than commensurate water use reductions within a watershed. If the watershed is eventually shown to be restored, no net increases in water consumption should be allowed.

E. Equitable access to water should be ensured

Basin waters are a basic public trust. Clean potable drinking water and a healthy ecosystem are basic human rights. Water must be available to everyone but it belongs to no one.

- Metering and full-cost pricing should be a priority for all sectors, but no one should be denied access to water for the basic human needs of drinking, cooking, and bathing
- Users who profit from consumptive uses of water or alteration of the water system should be charged a fee for the privilege. These fees should never establish a legal right to alter the system or maintain an alteration of the system. These funds should be invested exclusively in water management activities, such as monitoring, restoration, enforcement, data collection, and research
- Governments should ensure that public and local control is maintained over water provision and treatment systems
- All basin states, provinces, tribes and municipalities should develop drought policies that prioritize uses and practices in times of water shortage

- Humanitarian aid to water-short regions of the earth should not be provided in the form of physical water, but in the form of technology, professional expertise, and conservation planning assistance such as reforestation and other local water protection techniques
- Canada and the United States should fund extensive research into desalination technology, and should assist in the establishment of an economically viable world desalination industry.

F. All decisions must be made in a way that is open and accessible to the public

How and by whom decisions are made about using water or altering the water system are critical to proper management of the Great Lakes and St. Lawrence River ecosystem.

The full range of water-related decision-making processes must be open and subject to challenge by citizens. Such decisions include the development of strategies, policies, and standards as well as specific proposals to use water or alter the water system.

All basin citizens and users of the system, including those who speak for fish and wildlife, should be notified of all water-related decision-making plans, and have their views solicited and incorporated into final decisions. The permitting process must allow citizens to appeal decisions and sue to alter or reverse a permit decision after the fact if the permitted activity is inconsistent with government ecosystem protection standards or causes unanticipated damage.

G. All levels of basin government must participate and work cooperatively in developing and implementing water use strategies and standards

Since the Great Lakes and St. Lawrence River basin is one ecosystem, it is essential that all levels of the region's government work in cooperation. Water use management strategy, standards, information-gathering, and research should be conceived and carried out either collectively or cooperatively.

Given their disparate jurisdictions and resources, the different levels of government should take the lead in different aspects of basin water use management.

The state, provincial, and tribal governments

Constitutionally and traditionally, state, provincial, and tribal governments in both the United States and Canada have the lead responsibility for decisions on use and alteration of the water of the Great Lakes and St. Lawrence River system.

The states and provinces should fully exercise their public trust responsibilities to protect and restore the full functioning of the Great Lakes and St. Lawrence River water system.

Accordingly, they should take the lead in crafting a collective strategy for managing basin water use and changes to the water system that is based on protecting the basin's waters. They should also design the standards and mechanisms that will implement this strategy.

These mechanisms should include institutionalized relationships with nongovernmental organizations, such as Waterkeeper organizations, that have assumed formal or informal stewardship of regional water bodies and water systems.

The federal governments

The federal governments are responsible for protection of transboundary waters and for protecting those aspects of domestic waters that involve national and international interests.

Therefore, rooted solely in the national responsibility to protect internationally shared waters, the federal governments should:

- Take the lead role in assuring the availability of a constitutionally valid mechanism that allows international cooperation to protect Great Lakes and St. Lawrence River waters
- Partner with state, provincial and tribal governments in the development of a basin water use management strategy that is ecologically protective.
- Provide a backstop of protection for the region's waters-dependent ecosystems, rooted solely in the national responsibility to protect shared international waters. Such backstop roles could include assuring that some form of ecosystem protection strategy guides regional water use should regional governments fail to create a strategy, or having the power to veto but not approve certain proposed out-of-basin diversions
- Work to remove ambiguous language from trade agreements regarding natural waters

Local and municipal governments

With the powers delegated to them by the states and provinces, local and municipal governments traditionally take the lead in planning development, permitting specific water use practices, and constructing and maintaining water infrastructure. Therefore, local and municipal governments should take the lead in restricting development projects to available water supplies, and in developing and implementing water conservation programs. Local government should also solicit the input of local citizen activists, such as those involved in the Remedial Action Plan and Zones d'Intervention Prioritaire processes, since they often have extensive knowledge of the effect of human tampering with the water system.

Because of their critical role, local and municipal government must be fully involved in the development of the basin-wide water conservation strategy.

Intergovernmental relations

Since only a collective process will successfully protect an ecosystem that spans so many jurisdictions and sovereignties, each level of government with a stake in the ecosystem should have its proper voice in managing the shared waters of the Great Lakes and the St. Lawrence River basin:

- Tribal governments should be included in deliberations by state and provincial governments on a strategy for ecologically protective basin water use management
- The International Joint Commission is the ecosystem's most experienced and effective binational institution. The strategy should request that the commission:
 - create specific, binational protection and restoration goals for the water system
 - serve in an advisory role to the governments for the creation of water use management standards
 - have a standing reference to review the progress of the strategy every ten years

- serve in an advisory role to the federal governments on the creation of a constitutionally valid binational mechanism for basin water use management
- play a formal role in any institutional arrangements called for in the strategy
- The standards and mechanisms agreed to for implementing the strategy should be binding on its signatories. Fifteen years after its signing, the non-binding Great Lakes Charter has, for the most part, not been implemented
- The governments agree on a dispute resolution process, perhaps overseen by the International Joint Commission, to address disagreements between federal, tribal, provincial, or state governments over implementation of the collective standards to which they have agreed
- The strategy should include strong mechanisms for assuring that all basin governments act cooperatively in water use management affairs. Such mechanisms include creation of shared institutions and requirements for notification, hearings, and consent
- Any proposal for a new or increased removal of water from the Great Lakes and St. Lawrence River basin should require notification and approval of all federal, provincial, state, and tribal governments in the basin. The basis for approval or denial of such a proposal should lie in the overarching principles and standards for ecologically based water use management created by the basin's governments
- Any proposal for a significant new or expanded consumptive use or alteration of flows within the Great Lakes and St. Lawrence River basin should require notification to the public and formal consideration of comments from basin citizens and all basin federal, provincial, state, and tribal governments
- The governments should agree on a formal dispute resolution process to which federal, tribal, provincial, or state governments can appeal if they are dissatisfied with the decision by another jurisdiction regarding a significant proposed water action
- The relevant deliberations and communications of jurisdictions proposing removals or changes to the water system, and of appeal or dispute resolution bodies considering decisions on such proposals, should be fully open to receive the scrutiny and input of the basin public and all interested basin governments

H. Water use strategy and programmes should be enforceable

For the management regime envisioned in this document to be effective, it must be backed by binding and enforceable laws. Laws adopted in the states and provinces must carry penalties for non-compliance. Citizens should have the right to file suit to compel government action, when governments fail to enforce the laws. To the extent that the public trust doctrine or other long-standing regional legal principles apply, they must be respected.

I. Water use strategy and programmes should be international in character

The ecosystem respects no political boundaries, though it suffers from them. Canada and the United States must collaborate vigorously to ensure effect protection of the shared ecosystem of the Great Lakes and St. Lawrence River.

Nearly a hundred years of Great Lakes water management under the Boundary Waters Treaty of 1909 suggests that the treaty could be updated or that a new treaty between the United States and Canada could be created to ensure that water use management decisions in the Great Lakes region are made in a manner that is legally binding and in the best interests of both countries and the ecosystem they share. An amendment to the 1909 treaty or a new treaty is needed for several reasons, including:

- Water bodies that do not fall directly on the U.S.-Canada border are not currently covered by the Boundary Waters Treaty. For example, Lake Michigan is wholly within the United States and therefore does not have treaty protection, despite that fact that Lakes Michigan and Huron form a single lake hydrologically
- Most of the criteria for making water decisions under the existing treaty are grounded in what is best for navigation and the generation of hydroelectric power. Ecological and biological considerations are an afterthought
- The treaty does not include the tribes, which are sovereign nations
- The treaty fails to require interjurisdictional consultation among the provinces, states, tribes, and other affected parties
- The dispute resolution provisions of the treaty have never been used in disputes over water in the basin

J. Decisions about water uses require sound data collection and scientific research

Policymakers and the public must have reliable information on which to base conservation programs and decisions to alter the Great Lakes and St. Lawrence River system, and with which to evaluate past decisions. Therefore, all basin governments should collect extensive data on the sources and extent of human use and consumption of water and on ground and surface water quantities and flows. This data should be collected in a uniform manner and on a watershed-by-watershed basis.

Governments should fund extensive studies of:

- Detailed mapping of basin aquifers, including volume and locales of springs or groundwater contribution to surface waters, and of ground and surface recharge and runoff zones
- The functioning of the Great Lakes and St. Lawrence River water systems
- The functioning of water in the basin's ecological communities, particularly for the region's unique assemblages of life in such places as coastal marshes
- Linkage between the region's permitting and other water use databases with public and private databases describing the region's ecological communities
- The impact of climate change on regional precipitation, basin stream flow, and lake and land evaporation and transpiration
- Methods for determining what quantity of water use and consumption is sustainable for a given watershed
- Agricultural and energy-related water uses, and ways to reduce their quantity

Proposals by government or the private sector to use water, renew water use permits, alter the water system, or renew permits for such alterations should be accompanied by extensive, user-supplied studies demonstrating compliance with the standards applicable to the proposed use. Such proposals

should also contain commitments for user-funded, ongoing monitoring of the ecosystem impact of permitted alterations or uses.

All such studies and monitoring data should be publicly accessible in a manner that is understandable and useful to lay citizens. This water information should be made publicly available as soon as possible but no later than six months after the end of relevant reporting years. Lack of data should not delay implementation of conservation-based decisions, especially in the short term.

K. Education must be a cornerstone of Great Lakes water use management

Students and adults in the region need to learn about the value of water, the critical need for its conservation, its role in the history and culture of the Great Lakes region, its importance as a scarce commodity and a finite resource that is not primarily either a commodity or resource, and its central role in supporting the full range of native biodiversity and community types.

Funding must be provided to support this kind of education in schools and the media.

Next Steps

The Canadian, United States, tribal, provincial, and state governments should impose an immediate moratorium on all

- New or increased diversions into or out of the Great Lakes and St. Lawrence River basin
- New or expanded uses, diversions, or other changes to the water system within the basin.

until a basin-wide strategy and implementation tools—including enforceable standards and water conservation plans, with targets for each type of user—have been developed and put into legislation and permitting.

The Sponsoring Organizations

Great Lakes United is a coalition of 170 organizations from the United States, Canada, and First Nations, working to protect and restore the Great Lakes – St. Lawrence River ecosystem. The coalition has offices in Buffalo, New York, (716) 886-0142, and Montréal, Québec, (514) 396-3333.

Canadian Environmental Law Association, a public interest legal clinic, has advocated for Great Lakes protection reforms for over thirty years. The association is based in Toronto, Ontario, (416) 960-2284.

National Wildlife Federation, the largest member-supported conservation education and advocacy group in the United States, unites people from all walks of life to protect nature, wildlife and the world we all share. The federation is based in Ann Arbor, Michigan, (734) 769-3351.

Lake Michigan Federation, formed in 1970, is the oldest citizens' Great Lakes organization in North America. Its mission is to restore fish and wildlife habitat, conserve land and water, and eliminate toxins in the watershed of the largest lake within the United States. The federation has offices in Chicago, Illinois, (312) 939-0838, and Muskegon, Michigan, (231) 722-5116.

Stratégies St-Laurent is a coalition of Québec's "ZIP" committees and some environmental groups. ZIP committees are responsible for getting local authorities, industries and citizen groups working together to restore ten environmental problem areas identified along the St. Lawrence River. The coalition is headquartered in Québec City, Québec, (418) 648-8079.