Environment Canada Environnement Canada

Canada's Response to the Recommendations In the Twelfth Biennial Report on Great Lakes Water Quality of the International Joint Commission

Canada

Table of Contents

Chapter 1 – Physical Integrity: Impact of Urban Areas on Great Lakes Water Quality

Chapter 2 – Biological Integrity: Impacts of Aquatic Alien Invasive Species and Pathogens

Chapter 3 – Chemical Integrity: The Example of Mercury

Chapter 4 – Ecosystem Integrity: The Changing Lake Erie Ecosystem

The Government of Canada welcomes the recommendations contained in the *Twelfth Biennial Report* of the International Joint Commission (IJC). Canada remains committed to the principles and objectives of the *Great Lakes Water Quality Agreement* (GLWQA),and appreciates the ongoing work of the IJC, its views on progress under the GLWQA, and its advice on opportunities to improve the performance and effectiveness of government programs designed to accelerate progress on cleaning up the Great Lakes.

Canada recognizes the importance of binational cooperation and coordination in restoring and maintaining the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem. This commitment to work with the United States is reflected in the November 2004 Canada-United States statement on common security and prosperity, wherein Prime Minister Martin and President Bush pledged to build on joint efforts to achieve clean air and clean water in regions such as the Great Lakes.

Canada and the United States share a long history of cooperation and coordination in the Great Lakes. For more than 30 years, the GLWQA has been a model of binational cooperation, establishing shared objectives and a framework for domestic and coordinated binational action. The terms of the GLWQA require the governments of Canada and the United States to undertake a comprehensive review of the operation and effectiveness of the Agreement following every third IJC biennial report. This requirement was formally triggered with the release of the International Joint Commission's *12th Biennial Report* on September 13, 2004. The current review of the Great Lakes Water Quality Agreement provides an opportunity to ensure that the Agreement continues to be a visionary statement that will guide not only governments, but also members of the Great Lakes community in the continued protection and restoration of the Great Lakes.

The Government of Canada has also underscored its commitment to protect and preserve this internationally significant shared ecosystem. In February 2005, the Federal Government announced a further $40 million over five years to extend the Great Lakes Action Plan. This funding will build on past achievements to improve the ecological integrity of the Great Lakes ecosystem and will continue the environmental restoration of key aquatic areas of concern identified under the Great Lakes Water Quality Agreement.

In addition, the Federal Budget addresses key threats to the health of the Great Lakes and St. Lawrence River ecosystem: climate change, alien invasive species, and population growth and development. Many of these challenges have been recognized and addressed by the Commission in its *12th Biennial Report.*

Canada's Response to the recommendations in the IJC's *12th Biennial Report* reflects the input of several of the federal and provincial agencies that contribute to the overall Canadian program on the Great Lakes. These agencies include Environment Canada, Health Canada, Fisheries and Oceans Canada, Agriculture and Agri-food Canada, Transport Canada, Public Works and Government Services Canada, Natural Resources Canada, Parks Canada, the Ontario Ministry of the Environment, the Ontario Ministry of Natural Resources, and the Ontario Ministry of Agriculture and Food.

Chapter 1 – Physical Integrity: Impact of Urban Areas on Great Lakes Water Quality

1. IJC Recommendation: The Parties take binational actions to address the impact of urban land use on Great Lakes water quality by:

- evaluating under what circumstances best management practices are effective in managing urban runoff;
- ensuring that information on urban best management practices reaches local authorities and implementers; and
- assessing the cumulative effects of management actions to minimize the impacts of urbanization on the Great Lakes, using the Lake Erie basin as an example.

Canada agrees that the impact of urban land use on Great Lakes water quality is an important issue and recognizes that some areas in the Great Lakes have outstanding challenges related to combined sewer overflows and stormwater discharges. Due to the continued rapid growth and development of urban areas, in southern Ontario in particular, this issue is increasing in importance. Canada therefore also agrees with the need to plan and manage urban growth and mitigate its impacts on the natural environment, particularly on urban watersheds and nearshore areas of the Great Lakes. To meet this need, the Province of Ontario has a number of major planning initiatives underway, including the Growth Management Plan (Places to Grow), Greenbelt Plan, Planning Reform and Source Water Protection, that are designed to curb urban sprawl, to protect key natural heritage, prime agricultural and source water lands, and to promote more sustainable urban development patterns.

A considerable amount of effort is also being devoted to identifying and sharing best management practices. Efforts to evaluate the effectiveness of best management practices on managing urban runoff, both from a water quantity and water quality perspective, include:

- The Stormwater Assessment Monitoring and Performance (SWAMP) program, a joint initiative of the Government of Canada's Great Lakes Sustainability Fund (GLSF), the Ontario Ministry of the Environment, the Toronto and Region Conservation Authority and the Municipal Engineer's Association. The effectiveness of a number of conventional and innovative stormwater management technologies were evaluated, including wet ponds and constructed wetlands, underground storage tanks, flow balancing systems, conveyance exfiltration systems and oil grit separators.
- More recently, projects supported by GLSF and others, have focused on: the characterization and testing of high-rate treatment of combined sewer overflows (including vortex separators, microscreening and physical/chemical treatment processes in retrofitted conventional facilities); increased attention to source control technologies for wet weather flow management (green roofs); and urban growth issues, such as the control of sediments in runoff from construction sites.
- Pollution Prevention and Control Plans (PPCPs) that have been prepared by most Canadian Great Lakes municipalities with federal and provincial assistance. Through these PPCPs, municipalities identify their wastewater pollution problems, set priorities for remediation and plan the most cost-effective way of meeting their remediation goals, including the use of new, innovative technologies and optimization procedures. The completion of PPCPs in most of the Canadian Areas of Concern has also positioned local municipalities to be eligible for federal-provincial infrastructure funding.

Canada is also actively working with partners to ensure that information on urban Best Management Practices reaches local authorities and implementers. Examples include:

- Over the past 15 years, the GLSF and its partners have generated a wealth of information on: the characteristics of combined sewer overflows (CSO) and stormwater; performance evaluation of state-of-the-art CSO and stormwater treatment technologies; development and demonstration of sustainable cost-effective CSO treatment processes; incorporation of modeling and technologies used for addressing CSO and stormwater management into Pollution Prevention and Control Plans, and design of treatment systems; and research on CSO and stormwater related issues (e.g., toxicity, potential risks to wildlife).
- Information is widely disseminated through: guidance documents for stormwater management and pollution prevention (Guidance Manual for the Treatment of Combined Sewer Overflows); specialized CSO and stormwater management workshops to encourage networking between municipalities, consultants and government and to disseminate the latest findings on projects (Workshop on Integrated Urban Water Pollution Control Planning); transfer of information to other provinces and internationally, through such venues as GLOBE and the annual International Conference on Innovative Technologies in Urban Drainage, NOVATECH, France; presentations by project proponents and engineering consultants at technical symposia hosted by key municipal wastewater associations, such as the Water Environment Association of Ontario, Canadian Water Resources Association, the Canadian Association of Water Quality and RESEAU Environnement (Quebec); and peer-reviewed publications in scientific and engineering journals.

The creation of the Great Lakes and St. Lawrence Cities Initiative (GLSLCI) provides additional opportunity to identify and share best management practices, not only for effectively managing urban runoff, but also for addressing other issues of importance to the protection of the Great Lakes and to the communities within its drainage basin. Canada supports the priorities of the GLSLCI, which include sustainable water use, human health, toxic substances, invasive species, habitat, areas of concern, information management and sustainable use practices, and welcomes the further engagement of mayors in addressing Great Lakes issues.

The federal government is also assisting at the local level through Green Municipal Funds, a $250 million program to enable municipalities, large or small, to invest in sustainable infrastructure by removing investment barriers. The Green Municipal Funds, which are administered by the Federation of Canadian Municipalities, were established by the Government of Canada in 2000 to stimulate investment in innovative municipal infrastructure projects and environmental projects. The Funds support municipal actions to improve air, water and soil quality, to reduce greenhouse gas emissions, and to build sustainable Canadian communities. In the 2005 federal budget, an additional $300 million was committed to the program, $150 million of which will be used to help communities clean up and redevelop brownfields (abandoned sites where environmental contamination exists). To date, the Green Municipal Funds program has assisted more than 220 municipal governments and their partners, leveraging more than $1 billion in investment.

The Governments of Canada and Ontario, together with municipal officials, also have funding programs in place to improve local watershed infrastructure systems, bettering the health and safety of local communities. These investments, made under the Canada-Ontario Municipal Rural Infrastructure Fund, are directed at improving municipal facilities to further the elimination of combined sewer overflows.

The Ontario Ministry of the Environment's Provincial Water Quality Monitoring Network has also established excellent partnerships with provincial Conservation Authorities and received enhanced support from the Ontario government for the monitoring of water quality. These efforts are specifically designed to monitor and report on the impacts of land use for watershed planning and regulatory controls.

Binationally, the Governments of Canada and the United States are working cooperatively through the State of the Lakes Ecosystem Conference (SOLEC) to develop a suite of Great Lakes indicators. Indicators are an important tool in assessing ecosystem state, stresses acting on the ecosystem and the effectiveness of the response actions taken by Governments and others. The SOLEC Indicators Development Process has recently established a number of indicators addressing urban land use effects on Great Lakes water quality. These indicators include Urban Density, Land Cover-Land Conversion, Brownfield Redevelopment and Ground Surface Hardening. Inclusion of urban land use indicators will permit enhanced assessment of the impacts of urban land use of the Great Lakes ecosystem, and these impacts will be regularly monitored and reported on through the SOLEC process.

As a consequence of the considerable actions already being taken to address the impact of urban land use on Great Lakes water quality, Canada does not feel that further binational actions to assess the impact of urban land use on Great Lakes water quality are warranted at this time.

Chapter 2 – Biological Integrity: Impacts of Aquatic Alien Invasive Species and Pathogens

2. IJC Recommendation: The governments take the following measures to eliminate the threat and impacts of aquatic alien invasive species in the Great Lakes:

Take immediate action to:

- in the United States, pass the National Aquatic Invasive Species Act (NAISA) reauthorizing the National Invasive Species Act (NISA) of 1996;
- in Canada, implement the National Action Plan to address the threat of aquatic alien invasive species and finalize mandatory ballast water management practices; and
- ratify and implement the International Maritime Organization's Convention for the Control and Management of Ships' Ballast Water and Sediments, and pursue stringent measures and rapid timelines.

(a) in Canada, implement the National Action Plan to address the threat of aquatic alien invasive species and finalize mandatory ballast water management practices;

Canada agrees with the recommendation and is currently taking active steps to deal with aquatic invasive species (AIS) issues in all Canadian waters, including the Great Lakes. In September 2004, the *Canadian Action Plan to Address the Threat of Aquatic Invasive Species* was approved by the Canadian Council of Fisheries and Aquaculture Ministers. The goal of the Action Plan is to minimize unintentional and unauthorized introductions and spread of AIS that threaten Canada's environment, economy and society. The Action Plan outlines a strategic management framework for addressing AIS and their pathways of introduction. The Action Plan is available at www.cbin.ec.gc.ca/primers/ias_aquatic.cfm?lang=e.

The Ministers requested an implementation plan for AIS by September 2005 that outlines federal and provincial priorities for immediate action. Included among these priorities are: a risk assessment model that reflects biological, economic and societal considerations for all pathways and the costs and benefits of prevention measures; a national early detection / rapid response framework that is tied to the risk assessment framework and incorporates available scientific expertise; and an "engaging Canadians" component that focuses on public education, outreach and stewardship. The recent federal announcement in Budget 2005 provided an additional $85 million over five years to address the unintentional introductions of both aquatic and terrestrial invasive alien species. The funding is aimed at the key federal priorities in what will become the implementation plan.

Fisheries and Oceans Canada provided peer-reviewed advice for alternative ballast water exchange zones for the Pacific coast, Scotian shelf and Gulf of St. Lawrence in January 2005. Upon receiving this scientific advice, Transport Canada completed the drafting of ballast water exchange regulations under the *Canada Shipping Act.* The proposed regulations are harmonized with current U.S. regulations and include certain measures adopted under the International Convention for the Control and Management of Ships' Ballast Water and Sediments at the International Maritime Organization, but do not at this time fully incorporate the provisions of the Convention. The proposed regulations would include provisions for No Ballast On Board (NOBOB) vessels entering the Great Lakes to meet salinity requirements for sediments before adding and discharging fresh water in the Great Lakes.

(b) ratify and implement the International Maritime Organization's Convention for the Control and Management of Ships' Ballast Water and Sediments, and pursue stringent measures and rapid timelines.

The impact of aquatic invasive species from shipping is a global issue that can best be addressed through the implementation of international requirements. Transport Canada has indicated its desire, through national and regional consultations of the Canadian Marine Advisory Council, to introduce regulations under the *Canada Shipping Act 2001* that would implement the provisions of the International Maritime Organization's (IMO) Convention for the Control and Management of Ships' Ballast Water and Sediments. The results of these consultations showed support for this proposal. The introduction of such regulations could occur in 2008 as part of Transport Canada's regulatory reform project, which would allow Canada to accede to the Convention and help bring it closer to entering into force. Full implementation of the provisions of the Convention as they relate to non-Canadian ships could be implemented only when the Convention enters into force internationally, 12 months after ratification by at least 30 States, representing 35 per cent of world merchant shipping tonnage. The performance standard for ballast water treatment and the approval of systems and ships by all Parties based upon this standard form the basis for the Convention. Consideration is being given to whether stricter measures are necessary and could be practically implemented in Canada. Transport Canada and Fisheries and Oceans Canada continue to contribute to the development of the guidelines necessary to implement the IMO Convention.

3. IJC Recommendation: Issue a reference on aquatic invasive species to the International Joint Commission to:

- help identify the most effective ways to coordinate binational prevention efforts and harmonize national plans, particularly those dealing with residual ballast water and sediment in ballast tanks;
- evaluate the effectiveness of current institutional arrangements;
- assist with the establishment of a regional standard stronger than the minimum required by the International Maritime Organization Convention;
- ensure that economic analyses carried out for projects with potential environmental effects include the environmental and societal costs of aquatic invasive species control, damage, and mitigation, and the costs and benefits of prevention measures; and
- assist with public education and communications.

The importance to Canada of combating the spread of invasive species in coastal and fresh waters was reaffirmed in the March 2005 trilateral Prosperity Agenda for North America agreed to by Prime Minister Martin, President Bush and Mexican President Fox.

Canada recognizes and values the International Joint Commission's contribution to increasing public awareness and understanding of aquatic invasive alien species in the Great Lakes basin ecosystem. Under the "Our Environment Theme" of the October 2004 Speech from the Throne, the Government of Canada committed to addressing invasive species in cooperation with the United States and agencies like the International Joint Commission. Canadian officials met with the Secretariat of the United States National Invasive Species Council in November 2004 to discuss priorities of mutual interest, including the International Joint Commission's request for a reference to harmonize and coordinate binational efforts to prevent the introduction of aquatic invasive species into the Great Lakes. Canada has evaluated those proposed elements of an IJC Reference and is interested in the Commission's potential to assist in addressing invasive alien species issues with either socio-economic analysis or through public education and outreach. In considering a reference, Canada is interested in a geographic scope that is national rather than Great Lakes-centred.

The $85 million over five years in invasives-related resources announced by the Government of Canada in Budget 2005 will be used to initiate the implementation of *An Invasive Alien Species Strategy for Canada.* With the new resources, the Canadian Food Inspection Agency (CFIA), the Canadian Forest Service and Fisheries and Oceans Canada will be in a better position to move

forward on shared priorities with the U.S. Included among these priorities will be both terrestrial and aquatic issues.

Budget 2005 will also allow the Government of Canada to address some of the common elements that have been identified as priorities in the terrestrial and aquatic action plans associated with Canada's national Strategy. One such element is the need to engage Canadians through public education and awareness programs.

4. IJC Recommendation: All levels of government should create and implement coordinated planning actions to fully protect drinking water sources from increased pressures from industry, urban expansion, aging infrastructure and agriculture, including ecosystem and human health protection from large-scale animal operations.

Canada agrees with this recommendation and is already actively pursuing initiatives at the federal, provincial and municipal levels to protect drinking water, many of which involve intergovernmental coordination.

The October 2004 Speech from the Throne highlights the federal government's commitment to ensuring clean water for Canadians. It is primarily the responsibility of the provincial and territorial governments to manage and protect water quality, including providing and regulating drinking water and wastewater services; however, the federal government plays a significant role in protecting water quality by regulating toxic substances, conducting water quality research, promoting pollution prevention and working in collaboration with the provinces and territories to clean up and prevent pollution. The federal government is also committed to ensuring safe drinking water within its purview and to promoting and encouraging a consistent approach to protecting and improving the nation's drinking water by provinces, territories and local governments.

The Canadian Council of Ministers of the Environment works to promote effective intergovernmental cooperation and coordinated approaches to inter-jurisdictional issues. For example, jurisdictions have collaborated in many areas, including the development of Canadian Water Quality Guidelines, a water quality index and guidance to drinking water system owners and operators on how to apply the concept of the multi-barrier approach to Canadian drinking water supplies from source to tap. Jurisdictions consider source water protection as the first line of defence in a multi-barrier approach to ensure safe drinking water.

A First Nations Water Management Strategy is in place to address water and wastewater issues on First Nation lands. The source to tap, multi-barrier approach will be adapted and implemented to First Nation Communities by developing tools and providing guidance on source water protection aimed at enhancing the capacity of First Nations to: conduct their own source water assessments, undertake monitoring of their source water, and develop and implement their own source water protection plans. Work is underway to publish a manual on *Guidance for Providing Safe Drinking Water in Areas of Federal Jurisdiction*. The purpose of this document is to provide clear guidance on ensuring the safety of drinking water for federal facilities and First Nation lands.

In addition, the federal government cost-shares, with provinces and territories, new construction and upgrades to municipal water and wastewater treatment systems and encourages watershed planning. As of 2003, municipalities applying for Canada Strategic Infrastructure funding are required to submit or commit to developing an integrated watershed management plan that addresses demand management (e.g., metering and pricing) where appropriate and lifecycle costing.

Protecting drinking water is also a priority at the provincial level in Ontario. The Province of Ontario is developing a source protection framework that would mandate the development of plans to protect drinking water at its source for watersheds across the province. The framework will require the assessment of the current conditions of sources of drinking water, the identification of threats to their condition and the development of strategies outlining actions that are required to be implemented to manage those threats.

During the last two years, Ontario has gone through a comprehensive process to develop a source protection framework:

- Considering the recommendations of Justice O'Connor in his *Report of the Walkerton Inquiry;*
- Funding groundwater studies for 95% of the province to support the development of local and regional groundwater strategies;
- Releasing a White Paper to describe the planning components of proposed source protection legislation;
- Undertaking province-wide public consultation;
- Posting the draft text of source protection legislation, followed by a public comment period; and,
- Establishing two committees – the Technical Experts and the Implementation Committees – to provide advice on the implementation of source protection.

The reports of the two committees were posted on the Environmental Bill of Rights (EBR) Registry on December 14, 2005.

In addition, Ontario held seven sectoral roundtables in early February 2005 with a range of stakeholders, including non-governmental organizations (NGOs), agricultural representatives, conservation authorities, industry, municipalities and First Nations, to solicit feedback on the two expert committee reports.

The Government of Ontario will be considering the recommendations of the two committees, as well as public comments received, in finalizing a source water protection framework.

The province has also made considerable investments to protect drinking water sources over the past several years. These investments include:

- $19.3 million in groundwater studies to allow municipalities and conservation authorities to collect a baseline level of technical information regarding their groundwater resources and potential threats to drinking water safety. When the studies are completed, over 95% of groundwater-reliant communities will have wellhead protection areas identified for active municipal wells.
- $12.5 million to contribute to the development of source water protection plans, including investments for conservation authority staff and resources (i.e., capacity building), water budgets, municipal technical studies and for advanced studies on protecting municipal wells.

Finally, pursuant to the Agricultural Policy Framework, an agreement between the federal government and the provinces and territories to work towards common goals, the federal and the Ontario and Quebec governments have agreed "to reduce agricultural risks and provide benefits to the health and supply of water, with key priority areas being nutrients, pathogens, pesticides and water conservation". Programs to identify and address risks to water from agriculture, such as the Environmental Farm Plan, National Farm Stewardship Program and Greencover, are important contributors to protecting drinking water sources in the Great Lakes basin.

Chapter 3 – Chemical Integrity: The Example of Mercury

5. IJC Recommendation: Undertake retrospective and prospective epidemiological studies in Areas of Concern and other pertinent locations of the Great Lakes basin, to better understand potential neuro-developmental effects associated with methyl mercury and PCBs.

Canada agrees with the intent of this recommendation and notes that a need exists for more recent monitoring and perhaps also for epidemiological research on the human health effects from various persistent toxic substances in the Great Lakes.

Health Canada is committed to protecting the health of Canadians by funding research on potentially vulnerable populations. Historical data from Health Canada's Great Lakes Health Effects Program (1989-2000) for Great Lakes populations (including those living in Areas of Concern) did not show that these were populations at risk from high exposures. However, Health Canada is currently following the progress of studies that are underway in the U.S. Great Lakes region, in the Canadian North (where the population is exposed to higher levels of mercury than in the Great Lakes) and in other parts of the world where mercury and PCB exposures are higher. These studies will provide an increased understanding of the effects of these substances on the neuro-development of humans and guide the need for future epidemiological studies.

For mercury, the most significant route of exposure for humans is through fish consumption. The research to date identifies a spectrum of health effects associated with mercury exposures with more severe effects reported at higher exposures not usually encountered by Canadians; more subtle and non-clinical, yet important effects are reported in some studies in children whose mothers were exposed at somewhat lower levels through consumption of traditional diets of fish.

There are limitations in the methodology for assessing and determining neuro-developmental effects because of the challenge of controlling for confounders or other possible explanations for the health effects being observed. Another challenge in carrying out this research is the time and cost required for prospective work. The strength of epidemiological research increases when study design for prospective work can span long time frames to better determine what subtle effects might result from very low-level exposure over many years. Health Canada is looking to partner with Canadian research initiatives addressing maternal and newborn health issues, where the Department would like to include exposure to environmental chemicals as part of the study design. Health Canada is currently engaged in and will continue to seek, through a wide range of scientific investigations, opportunities to assess and manage the risks that mercury and PCBs may pose to the health of Canadians.

Canada will work with the Provinces and its U.S. partners to further improve the conditions in the Great Lakes so that human health is protected. Canada and the U.S. will continue in their cooperation and coordination to reduce pollution, improve air and water quality and reduce sources of land pollution.

6. IJC Recommendation: Make fish advisories clear, simple, and consistent, and ensure that they are reaching the intended audiences.

Canada agrees with the intent of this recommendation and is making efforts to improve fish advisories and ensure that they reach the intended audiences. Some Great Lakes fish are safe to eat and the situation is improving. Nevertheless, people should be aware of consumption advisories recommending limits on consuming Great Lakes fish.

Fish advisories are the responsibility of the Provincial government. Health Canada is responsible for setting standards associated with retail or commercial fish, while the Ontario Ministry of the Environment (MOE) is responsible for providing advice related to sport fish consumption.

The Ontario Sport Fish Contaminant Monitoring Program is the largest testing and advisory program of its kind in North America. Between 4000 and 6000 fish per year are tested through the program, which has been testing Ontario sport fish for more than 25 years. Fish samples are collected jointly by the MOE and the Ontario Ministry of Natural Resources (MNR) from approximately 1700 locations in lakes and rivers in Ontario, including the Great Lakes, and are sent to the MOE laboratory for analysis. The fish are analyzed for a variety of substances and the results are used to develop size-specific consumption advice for each species tested from each location. This advice is based on health protection guidelines developed by Health Canada. Guidelines for fish consumption are communicated by the MOE, in cooperation with MNR, through the biennial publication of *The Guide to Eating Ontario Sport Fish*.

The *2005-2006 Guide to Eating Ontario Sport Fish* is substantially different from previous editions in that it now contains separate fish consumption advisories for the general population and more stringent advice for the sensitive population of women of child-bearing age and children under 15. This is the result of long-term epidemiological studies on mercury intake which suggest potential neuro-developmental effects on fetuses and young children at lower levels than previously thought.

For individuals whose first language is not English or French, a two page summary of the Guide is available in 19 languages including: Cambodian, Cantonese, Cree, English, Filipino, French, German, Hungarian, Italian, Japanese, Korean, Mandarin, Ojibway, Polish, Portuguese, Russian, Spanish, Ukrainian and Vietnamese.

The Guide is distributed to district and regional government offices across the province, as well as sporting good departments and many major retail outlets. The Guide is also available to the public through the provincial MOE website at www.ene.gov.on.ca/envision/guide/ and a toll-free number (1-800-820-2716) is available to anyone with additional questions regarding the information contained in the Guide.

In effectively communicating the messages of fish advisories, the risks of fish consumption must be weighed and balanced against its benefits. Fish have a high nutritional value and are an excellent source of high-quality protein. They are low in saturated fat, which make them a healthy food choice. Because of this, fish consumption is encouraged for Canadians within the limits identified for vulnerable populations, as set out in federal guidelines and provincial standards.

The Canadian Food Inspection Agency regularly checks contaminant levels, such as mercury, in commercial and imported fish to ensure they meet the standards set by Health Canada's Health Products and Food Branch (HPFB). The HPFB also establishes the intake guidelines that form the basis for health advisories. In managing the risks, Health Canada has established a guideline for total mercury content in fish at 0.5 parts per million (ppm), which is lower than the limits set in many other countries.

Canada will continue to develop safe fish consumption guidelines and make efforts to continuously improve fish advisories.

7. IJC Recommendation: Select and promptly implement programs in both the United States and Canada that would substantially reduce the deposition of mercury in its reactive gaseous form in the Great Lakes region; also pursue multilateral strategies for further control of this persistent toxic substance on a global basis.

(a) Select and promptly implement programs in both the United States and Canada that would substantially reduce the deposition of mercury in its reactive gaseous form in the Great Lakes region;

Canada agrees with the intent of this recommendation. In Canada, mercury reduction programs have had considerable success in reducing all forms of mercury and Canada remains committed to achieving further reduction.

The Great Lakes Binational Toxics Strategy has been tracking progress on reductions, and between 1988 and 2002, Canadian releases in the Great Lakes basin have been reduced by 85%. Canada and Ontario are continuing mercury reduction programs in the basin, and under the *Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem* the parties have set a goal of 90% reduction by 2010.

Under the auspices of the Canadian Council of Ministers of the Environment (CCME), federal, provincial and territorial governments have worked cooperatively to establish Canada-Wide Standards for mercury. These standards include:

- Dental amalgam waste: 95% waste reduction by 2005
- Fluorescent lamps: 70% content reduction by 2005, 80% by 2010
- Base metal smelters: 30% emission reduction by 2008
- Incinerators: 70% emission reduction by 2006

A Canada-Wide Standard for coal-fired power plants is currently under development. The standard will be developed by 2005 and will consider a 60 – 90% capture of mercury.

In April 2005, the Ontario Government closed the Lakeview Generating Station. Lakeview is the first of Ontario's five coal-fired generating stations to close under the provincial government's coal phase-out plan.

Ontario has also been involved in many mercury reduction regulations:

- Ontario Regulation 196/03 required Ontario dental clinics (that place, repair or remove amalgam) to install separators by November 15, 2003. The installation of amalgam traps/filters reduces loadings to the municipal sewer systems substantially and immediately.
- Ontario Regulation 323/02 required existing hospital incinerators to close by December 6, 2003; these closures have been verified by Ontario Ministry of the Environment staff. Hospital incinerators were the fourth largest emission source of mercury in the province.

Ontario has implemented the Canada-Wide Standard (CWS) for mercury emissions from hazardous waste incinerators. Notices amending the Certificates of Approval for these facilities to include the mercury CWS limit (50 $\mu g/m^3$) were issued prior to the end of December 2003.

Finally, voluntary programs that implement lifecycle management approaches for mercury containing products, such as auto and appliance switches, thermometers, and industrial instruments and devices, are also expanding in the Great Lakes basin and have resulted in the capture of increasing quantities of mercury.

(b) also pursue multilateral strategies for further control of this persistent toxic substance on a global basis

Canada agrees with the need to address mercury emissions on an international scale and would like to see reduced risks to human health and the environment from global anthropogenic mercury emissions.

While Canadian atmospheric monitoring data and modeling results continue to confirm the importance of Canadian and U.S. sources to atmospheric concentrations and deposition of mercury in the Great Lakes basin, global anthropogenic mercury emissions are also reaching North America and may offset achievements in mercury reductions within the Great Lakes basin.

Canada is very active in advancing international action on mercury and we are currently engaged in a range of initiatives. In addition to our domestic programs, Canada will continue to pursue and support strategies that range from bilateral to multilateral, including strategies that involve non-governmental partners and stakeholders.

Ongoing initiatives include:

- with the United States: the Great Lakes Binational Toxics Strategy;
- with the United States and Mexico: the North American Regional Action Plan for mercury;
- with Arctic countries: the Arctic Council Action Plan mercury project;
- with Europe (including Russia) and the United States: the Heavy Metals Protocol to the United Nations Economic Commission for Europe Convention on Long Range Transboundary Air Pollution; and,
- globally: it was under Canadian leadership that the global mercury assessment, which has evolved into the current global mercury programme, was initiated in 2001 by the United Nations Environment Programme.

Canada is also engaging at the bilateral level with India and China. For example, with India, Environment Canada sponsored a preliminary mercury emissions inventory, and with the State Environmental Protection Agency in China, Environment Canada organized and held a bilateral mercury symposium in 2004. Follow-up to these activities is being explored.

Through all of these initiatives, Canada is seeking to reduce global mercury emissions.

Chapter 4 – Ecosystem Integrity: The Changing Lake Erie Ecosystem

8. IJC Recommendation: The Commission recommends that Governments continue to fund binational research efforts begun in 2002 and 2003 to better understand changes in the Lake Erie ecosystem. The institutional model provided by the *Lake Erie Millennium Network* should be considered for adaptation and adoption on the other Great Lakes to foster enhanced binational cooperation and communication.

Canada agrees that, fundamental to the responsible management of Lake Erie water quantity, quality and natural resources, is the continued understanding of the dynamic nature of the Lake Erie ecosystem and the changes that are occurring as a consequence of human activities in the basin. Research in support of effective decision-making for the management of Lake Erie's ecosystem resources is a priority within Canada and is shared among many jurisdictions and institutions.

Human interactions with the Lake Erie ecosystem have become increasingly complex as human activities within the basin diversify and intensify. Consequently, the research required to understand the impacts of these activities is increasingly complex. Binational cooperation, collaboration and communication among government and non-government research institutions are essential. Institutional models, such as the *Lake Erie Millennium Network*, have provided the framework for collaborative research and monitoring in Lake Erie since 2000. This collaboration has resulted in multi-partnered studies that have much improved the understanding of:

- impacts of zebra mussels on nutrient dynamics in the lake;
- dynamics of hypolimnetic oxygen (summertime low oxygen conditions) in the central basin;
- alterations to physical processes as a consequence of invading species; and,
- food web dynamics and contaminant transfer.

In turn, the results of these studies and others have been used in the evaluation of current management practices in the Lake and recommendations for changes where appropriate.

Canada intends to promote the development of binational research networks on each of the Great Lakes to address future research needs of water quality and natural resource managers, including those of Lakewide Management Plans.