

**CANADA'S RESPONSE TO THE RECOMMENDATIONS IN THE
ELEVENTH BIENNIAL REPORT ON GREAT LAKES WATER QUALITY
OF THE INTERNATIONAL JOINT COMMISSION**

JULY 2003

Chapter 1 - The State of the Great Lakes

1. **IJC Recommendation:** *Develop reliable data and accessible information to support indicators for the three desired outcomes of Drinkability, Swimmability and Fishability (fish that are safe to eat). This action should have priority status in the indicator process.*

Canada agrees with the intent of this recommendation. The Parties recognize the overall purpose of the Great Lakes Water Quality Agreement (GLWQA) " ... to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem." Of the multiple Great Lakes indicators identified through the State of the Lakes Ecosystem Conference (SOLEC) process, nine are grouped in the category of "Human Health", three of which are focused on the desired outcomes in the recommendation, namely:

1. those assessing the quality of drinking water;
2. the number and duration of swimming advisories due to elevated bacterial levels in the water, and;
3. the concentration of bioaccumulative chemicals in edible fish tissue.

These three issues are widely recognized and are popular with the public.

The Parties agree that "reliable" data are essential to the assessment and reporting process, and considerable efforts are involved in the collection and evaluation of data to support the three desired outcomes mentioned. Quality assurance is part of the process. The Parties also fully cooperate with the Commission to encourage the appropriate agencies to provide the underlying data that are collected to support these indicators.

2. **IJC Recommendation:** *Expand indicator development and reporting on additional desired outcomes only where resources are sufficient to access scientifically valid and reliable data.*

Canada agrees in part with the intent of this recommendation. The Great Lakes indicators were selected under the general criteria of "necessary, sufficient and feasible." There is no hierarchy of "key" or "priority" indicators followed by less important ones. One of the goals of the SOLEC process is to "strengthen decision making and management." Because the Great Lakes ecosystem is so complex, any one component can be influenced by a variety of management activities. Therefore, a considerable amount of information is required to make better, more informed decisions about potential management interventions. The Parties do not consider a detailed assessment of only a few environmental components to be sufficient to meet the requirements of the Great Lakes Water Quality Agreement.

Through the SOLEC process of identifying candidate indicators for the major

ecosystem components, existing and future data needs can be identified. The Parties can then determine how those data can be obtained, whether through existing monitoring programs or through new efforts. The Parties agree that the quality of underlying indicator data are important and have a direct bearing on subsequent management decisions that may be made based on those data.

Development and reporting efforts for Great Lakes indicators have attracted the interest of several organizations who are now eagerly assisting the Parties. For example, the Great Lakes Forest Alliance has provided leadership to select a subset of extensive forest indicators for reporting through SOLEC. Fostering this type of partnership between the Parties and non-government or quasi-government groups benefits the comprehensive assessment of the Great Lakes by providing information on previously unreported ecosystem components with minimal additional resource expenditures by the Parties.

3. IJC Recommendation: *Improve public information and decision-making by:*

(a) increasing funding, technology and staff for monitoring, surveillance and information management to support the SOLEC indicator reporting;

Canada supports the intent of this recommendation. The SOLEC process itself is not a monitoring program. To date, all of the information provided for the assessment of Great Lakes indicators has been supplied by existing monitoring programs or other data collection activities that were established for other (though perhaps similar) purposes. The Parties recognize that better coordination of monitoring efforts among the various jurisdictions and agencies could be achieved, implying that conserved resources would then be available to obtain additional information. A concerted effort has already begun to develop a basin-wide monitoring inventory; to identify monitoring drivers and existing coordination mechanisms; and to discuss possible means of improving binational monitoring coordination.

(b) making the findings from indicators and their supporting databases generally available to decision-makers and the public, and;

Canada agrees with this recommendation. The Parties prepare and release a biennial report based on the findings from the indicators. The most recent issue, **State of the Great Lakes 2001**, provided indicator assessments and lake basin assessments in clear, easy to read, language. The report was widely distributed and remains readily available on line at www.binational.net. The Parties intend to prepare the State of the Great Lakes 2003 in a similar style, and distribute it widely along with simplified highlight reports. The Parties continue to explore additional approaches to communicating the findings to environmental decision makers and managers at all levels of governance and to the broad interested public.

Making the supporting databases generally available will remain problematic at this time. For many of the indicators, the data reside with the cooperating agency or organization, and the indicator reports are prepared by the subject matter experts who have access to the underlying data. The indicator reports acknowledge the report authors and the data sources so that the reader can inquire directly about the underlying data. As part of the process for preparing the State of the Great Lakes 2003 report, a detailed technical reference document will also be assembled and made available. This technical report will provide contact information, data sources, literature citations, and quality assurance references for the indicator data and/or information. The Parties will continue to investigate more satisfactory solutions to providing the underlying data to secondary users.

(c) coordinating the databases in both Canada and the U.S. and linking significant Great Lakes databases.

Canada agrees with the intent of this recommendation. Information management will continue to be a central issue to the success of reaching the goals of the GLWQA. The Parties agree that, "We cannot overstate the enormous task of organizing a broad diversity of data and information from an array of organizations into a system that is accessible to and useable by a variety of audiences." Unfortunately, the linking of various databases is not easily undertaken, and issues remain to be resolved concerning the security of computing systems that grant public access, and the integrity of the data that are provided. SOLEC organizers will continue to explore means to provide access to indicator data in a timely manner for multiple users.

Chapter 2 - Toward Chemical Integrity: The Challenge of Contaminated Sediment and Human Health Impacts

1. **IJC Recommendation:** *Define explicitly the extent of sediment contamination and the goals for restoration so that remediation needs may be understood and publicly supported.*

Response to Recommendation

Canada agrees with the intent of this recommendation and notes that a substantial effort has gone into delineating areas of sediment contamination in the Canadian Areas of Concern (AOCs) using chemical criteria and sediment quality objectives. Decisions on sediment remediation interventions employ further evaluative steps including biological assessments and analyses of whether environmental objectives in a sediment remediation project are technically and economically achievable. In 2000, the Canadian government renewed its commitment to the GLWQA with an additional \$ 40 million dedicated to accelerate the completion of federal actions in the AOCs. Environment Canada's contribution included a major funding program for detailed chemical and biological assessments, by the department's National Water Research Institute (NWRI), of sediments in each of the remaining AOCs. The goal of this work has been to fill data gaps to allow for better assessment of the nature and extent of contamination at these locations. This will allow local planning teams to make informed and cost effective decisions on restoration strategies as they relate to the recovery of beneficial use impairments.

The commitment to implement required remedial actions related to contaminated sediment in Canadian AOCs has been documented by the Canadian federal and Ontario governments in the **Areas of Concern Annex** to the **Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA)**. Specifically in Result 4, "Management strategies for contaminated sediments", Canada and/or Ontario have made seven commitments:

1. Develop a risk-based, decision-making framework;
2. Consult with local communities on the development of management strategies;
3. Provide technical support and/or financial assistance for feasibility studies and remediation activities;
4. Undertake post project and long-term monitoring studies to determine the recovery of beneficial uses;
5. Develop publications and web sites and conduct workshops to promote management strategies and technologies for contaminated sediment;
6. Conduct detailed sediment chemistry and biological assessment in AOCs, and;
7. Use, where necessary, regulatory tools (e.g., director's orders) to advance the

remediation of sediment.

Canada is well advanced in the development of a COA risk-based decision-making framework which will be used to determine specific recommended actions for sediment remediation. The objectives of the risk based decision-making framework are:

1. Develop a rule-based, weight-of-evidence approach for assessing contaminated sediment on a site-by-site basis, which incorporates information from four lines of evidence: chemistry, toxicity, community structure and biomagnification potential. The approach is intended to be transparent, comprehensive (incorporating exposure, effect, weight of evidence and risk) and minimally uncertain;
2. Incorporate existing guidance/criteria, risk assessment considerations, and address unresolved issues and clearly articulate federal/provincial positions with respect to sediment management decisions, and;
3. Use as a method for reaching science-based decisions on sediment management in Great Lakes Areas of Concern and to fulfill the COA commitment to develop a sediment decision-making framework for AOCs.

A COA sediment task force has been established to develop approaches to risk assessment and decision making protocols in order to provide guidance to other AOCs and develop a COA decision making framework. This task is expected to be completed in fiscal year 2003-04.

The COA sediment task force will also assist technical staff involved with sediment assessment at individual AOCs by endorsing the use of government funds to: (a) accelerate the completion of ongoing and future federal Benthic Assessment of Sediment (BEAST) assessments on a priority basis, and (b) augment these assessments with additional field support by the Ontario Ministry of Environment (MOE) wherever necessary.

The draft manuscript entitled "Biomagnification and the Application of Ecological Risk Assessment Principles to the Management of Contaminated Sediment" will be incorporated into the COA decision-making framework. A sediment experts workshop planned for the fall of 2003 will ensure that the evolving science and current thinking with respect to sediment issues is incorporated in the final COA product. Policy implications and recommendations concerning federal/provincial management positions will also be incorporated.

Benthic Assessment of Sediment (BEAST)

NWRI – BEAST Study

Under the terms of reference for the NWRI's mandate, the Benthic Assessment of Sediment (BEAST) methodology is being applied to AOC assessments to further define the nature and extent of sediment contamination. Decisions on the spatial extent and severity of contamination are based on the type and number of species present in the AOCs, and the response (survival, growth and reproduction) of these animals in standard laboratory tests. The data from each AOC are compared with Environment Canada's biological guidelines that have been developed for both field populations and laboratory responses of benthic invertebrates. As a result, study maps are generated for each area that define the areas where biological effects are observed and will relate any observed responses to specific contaminants. The following AOCs have been assessed to date: Year 1 (2000/01): Peninsula Harbour, Hamilton Harbour, Bay of Quinte; Year 2 (2001/02): St. Clair River, Detroit River, St. Lawrence River (Cornwall); Year 3 (2002/03): St. Mary's River, Thunder Bay, and Lyons Creek (Niagara).

NWRI – Biomagnification Studies

Recent reviews of the BEAST framework have recommended the inclusion of information on the bioaccumulation of contaminants liable to biomagnify. To obtain this additional information, support has been received from the Great Lakes Sustainability Fund and the Ministry of Environment for work in several AOCs (Peninsula Harbour (Jellicoe Cove), St. Lawrence River (Cornwall), St. Clair River, Detroit River, Thunder Bay, and Lyons Creek). Resident benthic invertebrates have been collected in each of these AOCs and will be analyzed for mercury or persistent organic contaminants. The availability of the contaminant and the potential for biomagnification from sediments is being assessed.

Environment Canada and Ontario Ministry of Environment scientists have developed for the Great Lakes, a rule-based, weight-of-evidence approach for assessing the need for remediation in areas where sediment is contaminated. This decision making framework for sediment assessment includes the four above mentioned components and provides, on a site by site basis, a description of the current status of the site, the interpretation, and management recommendations. The use of this sediment decision framework is currently being applied to the AOCs.

It is also important to note that Canada and Ontario have committed to identify sites outside Areas of Concern that have contaminated sediments that act as sources of harmful pollutants and develop sediment management strategies. This commitment is described in the ***Lakewide Management Annex to COA*** Result 1 "Reduction in release of harmful pollutants on a lake-by-lake basis."

Work towards achieving this commitment is already underway and includes:

- A screening-level survey of sediment quality in Canadian tributaries to the lower Great Lakes has been conducted by Environment Canada. These broad scans will help determine the priorities for further action;
- Approximately 100 Canadian tributaries to Lake Erie were sampled in 2001, and 130 tributaries to Lake Ontario were sampled in 2002. The program has included Canadian tributaries to the St. Clair River, Lake St. Clair, the Detroit River, Lake Erie, the Niagara River and Lake Ontario as far east as the Bay of Quinte. Plans are in development to complete the sampling in Lake Ontario tributaries (from the Bay of Quinte downstream), and to initiate a similar program in selected Canadian tributaries to Lake Huron and Lake Superior;
- The purpose of the sampling is to identify any ongoing sources of contaminants from Canadian watersheds to the Great Lakes. Recently deposited (surface) sediments are screened for a number of compounds in the laboratory. The targeted substances include those considered to be critical pollutants in the lower Great Lakes, such as selected organochlorine compounds, polycyclic aromatic hydrocarbons and metals. Selected samples have also been analyzed for compounds of emerging concern. The results to date for the Lake Erie basin have been published as an internal Environment Canada report. The results for the Lake Ontario tributaries are being analyzed, and;
- As a result of this and other studies, EC and MOE have initiated targeted investigations to track-down sources of critical pollutants to the Great Lakes. Three pilot studies are underway in Lake Ontario watersheds to track down sources of PCBs. In the Lake Erie basin, targeted sampling has been conducted in an additional three watersheds where sources of critical pollutants are suspected. The results of the screening-level surveys are being shared with partners and combined with other available information to prioritize any necessary follow-up work. The prioritization of potential source track-down projects will be guided by a decision framework that is currently under development in partnership with the MOE.

The extent of sediment remediation and goals for restoration are described in the following Areas of Concern:

Detroit River

The Great Lakes Institute for Environmental Research (GLIER) at the University of Windsor has completed a modeling study of the entire Detroit River. This "Data Management and Modeling Framework for the Detroit River" will be used to help formulate and guide cleanup objectives. The results of a sediment survey conducted by GLIER will be used to assess the general quality of sediment on the Canadian side of the Detroit River. Given the magnitude of the loading of persistent bioaccumulative toxic substances to the river, regular monitoring of sources, contaminant levels in water, sediments and biota together with toxicity

testing is necessary.

Hamilton Harbour

Canada and Ontario are working with their government and industrial partners on the Randle Reef Sediment Remediation Project to remove and contain approximately 500,000 cubic metres of contaminated sediment from Hamilton Harbour. To date total expenditures to conduct environmental site assessments, investigate remedial options and technologies amount to 3 to 4 million dollars. Work to remediate PAH contaminated sediments in the area of Randle Reef is planned for 2004 and estimated at \$25 million. Decisions on other harbour hotspots are still pending.

Niagara River

Recently government agencies have monitored Lyon's Creek for PCB contamination of sediments to accurately pinpoint locations and to assess the quality of the sediments to determine if remediation is warranted. Once the results are known, agencies will develop recommendations for remediation.

Peninsula Harbour/Thunder Bay (Cascades)/St. Lawrence River (Cornwall)

Canada and Ontario are conducting biomagnification studies in Peninsula Harbour, Thunder Bay Harbour and the St. Lawrence River (Cornwall) to determine if methyl mercury in benthic invertebrates is also bio-available in higher trophic levels and whether methyl mercury concentrations exceed criteria for the protection of aquatic organisms. Through consultation with a working group made up of government agency staff and key industry and public stakeholders, the need to gather more information on the potential biomagnification of mercury, and sediment stability was identified. During 2003 decisions will be made on the severity of sediment contamination and the appropriate sediment management strategy for each AOC.

Port Hope

In March 2001, the Government of Canada, represented by Natural Resources Canada, and the three communities of the Town of Port Hope, the Township of Hope and the Municipality of Clarington, entered into a legal agreement for the clean-up and long-term management of local historic low level radioactive waste, including radioactive wastes found within Port Hope Harbour. With the signing of the legal agreement, the Government of Canada began a 10-year, \$260-million initiative, the Port Hope Area Initiative, to develop and implement a long-term solution.

St. Clair River

The most highly contaminated sediments in the St. Clair River are situated in a 2 km section starting at the upper portion of the Dow Chemical property line. This 2 km stretch has been broken into three zones. In Zone 1, a pilot scale sediment removal demonstration was undertaken by Dow Chemical to remove approximately 2000 m³ of contaminated sediment. The company plans to

remove an additional 12,000 m³ of sediment in Zone 1 in the summer of 2003. To address zones 2 and 3, the MOE and EC, working with Dow Chemical and other stakeholders, will undertake a risk assessment approach to managing remaining contaminated sediments. This activity is expected to be completed in late 2003.

St. Marys River

A comprehensive multi-agency contaminated sediment management plan for the AOC will be undertaken to finalize sediment assessment and to implement possible remedial actions. Environment Canada has undertaken a biological sediment assessment survey, which will be used, along with previous biological assessment findings to make decisions on the need for sediment remediation.

Wheatley Harbour

There are moderate levels of historical PCBs in Wheatley Harbour sediment. The preferred remedial option for these contaminated sediments has been natural recovery with continued navigational dredging; however recent findings have prompted additional work to evaluate the rate of natural recovery and possibly alternate remedial options.

- 2. IJC Recommendation:** *Set priorities and a schedule for contaminated sediment remediation based on the potential for benefits to ecosystem and human health.*

Response to Recommendation

Canada agrees with the intent of this recommendation. Priorities are set for sediment remediation as resources are made available and analyses are completed. Sediment interventions have been pursued or are under active evaluation at Thunder Bay, Peninsula Harbour, St. Marys River, Detroit River, Collingwood Harbour (delisted in 1994), Niagara River (at Welland), St. Clair River, Hamilton Harbour, Port Hope and St. Lawrence River (at Cornwall). At other locations decisions have been made that interventions will not be pursued and residual contamination will be left to natural recovery, for example at Spanish River (recognized by Canada and Ontario as an Area in Recovery in 1999) and Severn Sound (delisted in 2003). Under the recently signed Canada – Ontario Agreement a commitment was made to restore environmental quality and beneficial uses in at least two AOCs, complete all required actions under the Remedial Action Plans for at least six other AOCs and make progress towards rehabilitation of ecological systems in the remaining AOCs. A commitment under COA has also been made to develop a risk-based decision making framework to ensure a uniform assessment process across all the contaminated sediment sites. Once the assessment work is completed, a site-by-site schedule for remediation will be developed with the goal of initiating remedial activities within priority sites over the next five years.

While setting schedules for sediment remediation is a valid recommendation;

there are several variables which make this task difficult. A specific schedule cannot be set for contaminated sediment remediation because the timelines are affected by:

- Science/monitoring needed to take specific decisions is a lengthy and complicated process requiring several studies;
 - Detailed design specifications required for multiple contaminants and multiple hot spots;
 - Obtaining full resourcing when there is no clear polluter;
 - Negotiating Memorandum of Understandings (MOUs) and Agreements among the committed funders;
 - Environmental Assessment requirements for complex site conditions which require innovative solutions;
 - Public consultation considerations to ensure community acceptance
 - Lengthy time frame for tendering and awarding contracts;
 - Technological feasibility of remedial technologies, and;
 - Coordinating multi jurisdictional authorities to obtain approvals, authorizations permits etc.
3. **IJC Recommendation:** *Develop a long-term strategy for the remediation of contaminated sediment; ensure that it is adequately funded; and report on progress.*

Response to Recommendation

Canada agrees with the intent of this recommendation. As described in our responses to earlier recommendations, elements of a strategy for the remediation of contaminated sediment are already in place. This includes:

- Defining areas of sediment contamination based on chemical criteria and sediment quality objectives;
- Undertaking further evaluations based on biological assessments and the technical/economic effectiveness of interventions, and;
- Pursuing remediation at identified hotspots, or identifying sites where intervention is not warranted.

Coincident with these activities, considerable effort is being invested in the ongoing development of scientifically sound sediment assessment protocols and sustaining institutional relationships, partnerships and funding. Canada and Ontario have taken a significant step towards developing a long-term sediment remediation strategy for contaminated sediment by signing the 2002 Canada-COA. Work under the 2002 COA contributes to the completion of the collection

and analysis of the sediment assessment data, the development of a risk-based assessment framework to guide further site-specific remedial strategies and priorities, and the implementation of sediment remediation interventions at identified priority locations.

The strategy includes the development of site-specific funding partnerships between all levels of government and polluter(s) which will be required over the longer term to implement projects. The Government of Canada's \$30 million commitment to the restoration of AOCs is administered by Environment Canada's Great Lakes Sustainability Fund (GLSF) formerly the Great Lakes Cleanup Fund. Since 1990 the GLSF has spent approximately \$22 million towards contaminated sediment assessment and remediation in support of the GLWQA commitments. The Government of Ontario has committed \$50 million dollars for activities related to the restoration of beneficial use impairments (BUIs) in the Great Lakes.

EC is currently seeking federal funding programs to provide dedicated resources for contaminated sediment remediation of all known sites where remediation is required. Ongoing projects include the cleanup of the Northern Wood Preservers site in Thunder Bay and the development of a remediation strategy for Hamilton Harbour sediments, in particular Randle Reef. A long-term strategy to address other priority sites will be developed as new information becomes available from the assessment surveys. Strategies will also be developed over the next several months to identify funding commitments that will be required over the long term to implement these projects. Progress will be reported regularly as part of the commitments under COA, and biennially to the IJC as stipulated in the GLWQA.

The National Water Research Institute (NWRI) is a Directorate of Environment Canada's Environmental Conservation Service. The Institute is Canada's largest freshwater research facility with over 300 staff including aquatic ecologists, hydrologists, toxicologists, physical geographers, modelers, limnologists, environmental chemists, research technicians, and experts in linking water science to environmental policy.

NWRI activities in support of contaminated sediment include:

- Technology demonstrations for *in-situ* capping and treatment;
- Mapping techniques to delineate fine-grained contaminated sediments and determine their geometry, volume and stability;
- High-resolution multibeam sonar data for mapping the distribution substrate types as well as using detailed bathymetry;
- Measure spatial distribution of toxic substances, and assists in understanding the role human activities play in releasing these substances into the environment, and;

- Biological Sediment Assessment studies.
4. **IJC Recommendation:** *Provide dedicated U.S. and Canadian funding and programs focused on contaminated sediment remediation of Areas of Concern in the Great Lakes.*

Response to Recommendation

Canada supports the intent of this recommendation. As noted in its 11th Biennial Report, the Commission recognizes the allocation of \$50 million by Ontario as a contribution under COA, and Canada's \$ 30 million under the GLSF. The GLSF will continue to provide the resources and technical advice to assist in remediating contaminated sediment over the next two years.

Plans are underway to develop new strategies to complete all actions required to restore beneficial uses in AOCs and the Great Lakes. Canada and Ontario both recognize that dedicated funding is required to complete actions on contaminated sediment. Both levels of government have dedicated staff to address contaminated sediment issues and work co-operatively in the development of funding strategies for a cost effective and multi-partnered approach that applies the "polluter pays" principle.

5. **IJC Recommendation:** *Strengthen leadership for Remedial Action Plan (RAP) implementation with the focus on the restoration of beneficial uses.*

Response to Recommendation

Canada supports the intent of this recommendation and notes that strong leadership in RAP implementation has been demonstrated in Canada through the full restoration of beneficial uses in two Canadian AOCs, Collingwood Harbour and Severn Sound, and through the significant progress made towards the restoration of beneficial uses in the remaining AOCs. Canada and Ontario remain committed to continuing to provide strong leadership and have described their commitment to achieving ambitious results and goals over the next five years in the 2002 Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem. Together, Canada and Ontario lead the RAP process. In providing leadership, federal and provincial government staff provide overall guidance to the local AOC communities. They participate in local implementation groups where they exist and lead the RAP process in AOCs where implementation groups have not been formed. The two levels of government also provide funding to support local RAP champions where required. Working with the public and other stakeholders, government staff prepare documentation, reports, outreach products and project proposals. Canada and Ontario commit resources to support and lead implementation activities within our mandates and encourage the participation of local communities to implement actions which are their responsibility or within their jurisdiction.

Chapter 3 - Toward Biological Integrity: The Challenge of Alien Invasive Species

1. **IJC Recommendation:** *Immediately make existing voluntary guidelines for ballast water management practices mandatory and provide for measures of enforcement and compliance for all ships capable of carrying ballast water, including those not currently carrying ballast water.*

Response to Recommendation

Canada agrees in part with this recommendation. Ballast Water Regulations are being drafted and are expected to be included under the *Canada Shipping Act* by 2004. Regulations will be based on best management practices that are compatible with U.S. regulations for the Great Lakes and St. Lawrence River systems. The reporting requirements of the current voluntary "Guidelines For The Control Of Ballast Water Discharge From Ships In Waters Under Canadian Jurisdiction" will become mandatory under the Regulations to facilitate compliance and enforcement. Ballast water management practices will be developed for application to ships declaring "no ballast on board" (NOBOB) for inclusion in the Ballast Water Regulations when ongoing research in this area has been completed and suitable practices are better defined.

2. **IJC Recommendation:** *Develop uniform protocols for performance testing of ballast water:*
 - *develop best practices and any improvements for ballast management operations;*
 - *establish by the end of 2003 enforceable interim biological standards;*
 - *concurrently, establish biological standards for ballast water discharges from all ships and for new technologies for ballast water treatment.*

Response to Recommendation:

Canada supports the intent of this recommendation. Ballast water management best practices will be incorporated in Ballast Water Regulations under the *Canada Shipping Act*. Fisheries and Oceans Canada will work with Transport Canada to develop science-based biological standards for ballast water discharge and treatment. These standards will be reflected in the Ballast Water Regulations when developed.

Fisheries and Oceans Canada and Transport Canada participate in U.S. Coast Guard initiatives related to the establishment of technical standards for onboard ballast water treatment. The Government of Canada participates on the Marine Environment Protection Committee of the International Maritime Organization with respect to international regulation of ballast water exchange as an interim step, and ballast water treatment in the longer term. An International Convention for the Control and Management of Ship's Ballast Water and Sediments is

anticipated to be completed in 2004; it is anticipated that Canada will be a signatory to this Convention.

3. **IJC Recommendation:** *Ensure all ships built after a certain date have treatment technology incorporated in their construction as a condition for entry into the Great Lakes.*

Response to Recommendation

Canada conditionally agrees with this recommendation. Canada's Ballast Water Regulations will be initially based on best management practices, and eventually will include the incorporation of approved treatment technology onboard vessels operating in Canadian waters. Canada will continue to work through the IMO on establishing internationally recognized and accepted ballast water management practices. The proposed IMO regulations would implement a short-term ballast water exchange standard for existing ships and long-term ballast water performance standard for new ships built after 2010. Canada will continue to apply its national guidelines in coastal marine waters until such time as the Ballast water Regulations have been amended to incorporate the provisions of the proposed IMO regulations.

The applicability of IMO requirements to the Great Lakes and St. Lawrence River systems will be assessed once these regulations are finalized. Canada will work with the U.S. to develop compatible regulations for the Great Lakes and St. Lawrence River systems to replace, if necessary, the US regulations that have been in place since 1993 and the proposed Canadian regulations anticipated for 2004.

4. **IJC Recommendation:** *Design and implement economic incentives to encourage shipowners to continuously improve (ISO 14000) Ballast Management Practices.*

Response to Recommendation:

Canada agrees with the intent of this recommendation. Transport Canada is currently trying to develop a Green Ship program, which could include recognition of improved ballast water management practices, but this would only be one of many factors to be considered. As Transport Canada does not charge significant fees itself, economic incentives in the form of fee reductions will have to come from other agencies. Transport Canada is currently trying to convince some of these other agencies to participate in the program, but has yet to receive any confirmation.

- 5. IJC Recommendation:** *Fund research recommended by expert regional, national and binational panels, task forces and committees, especially focused on:*
- *research (including research for biological standards, criteria and indicators) for ballast water treatment necessary to drive technology, product development and ship design;*
 - *research to develop alternative technologies including biocides to achieve new standards and criteria for the elimination of Alien Invasive Species in ballast water;*
 - *research and technology development to reduce entrained and accumulated sediment in ship ballast water and tanks; and*
 - *research to develop analytical tools and procedures to permit the identification of new invasive species and to link these species to their possible points of origin and vessels of introduction.*

Response to Recommendation:

Canada agrees with this recommendation. The Government of Canada recognizes the importance of funding research for the development of ballast water treatment technologies, standards, and other priorities. In this regard, Transport Canada will lead the development of a ballast water research initiative in partnership with other federal departments and agencies and stakeholders.

This initiative will contribute to the development of a broader National Aquatic Invasive Species Plan that is being developed by the Canadian Council of Fisheries and Aquaculture Ministers' Aquatic Invasive Species Task Group. The Task Group is co-chaired by the federal Department of Fisheries and Oceans and the Ontario Ministry of Natural Resources, and includes the participation of the provinces and territories, Transport Canada, and Environment Canada. The National Aquatic Invasive Species Plan will be a major component of the inter-jurisdictional National Plan to address the threat of invasive alien species that is being developed for the Wildlife Ministers Council of Canada, the Canadian Council of Forest Ministers, and the Canadian Council of Fisheries and Aquaculture Ministers.

- 6. IJC Recommendation:** *Issue the Commission a reference to coordinate and harmonize binational efforts for action to stop the ongoing threat to the economy and the biological integrity of the Great Lakes.*

Response to Recommendation

Canada values the role played by the IJC in identifying and communicating the threat posed by invasive species in the Great Lakes. Canada remains committed to pursuing a coordinated binational approach to address invasive species in the Great Lakes. Binational efforts can benefit from additional input and support from the IJC, and Canada welcomes continuation of this dialogue.

Canada supports further discussions with the Government of the United States to assess options for enhanced binational coordination. Canada believes that

coordination activities should continue to focus on actions to address the management of ship ballast water as a priority pathway of invasion in the Great Lakes and other ecosystems.

The Government of Canada also supports additional discussions with the IJC and the United States on the scope of a potential reference to the IJC on invasive species and we look forward to commencing this dialogue.