ST. LAWRENCE
Action Plan 2011-2026

Sustainable Navigation Strategy for the St. Lawrence

2004–2011 REPORT | 2012–2017 ACTION PLAN

2021
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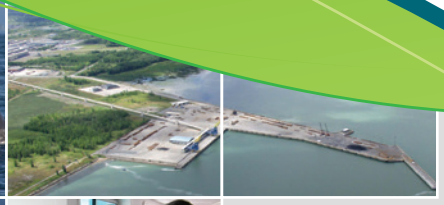

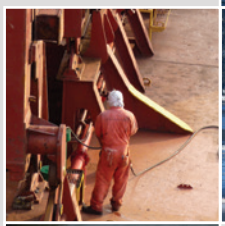

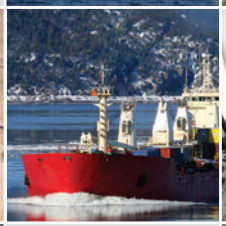

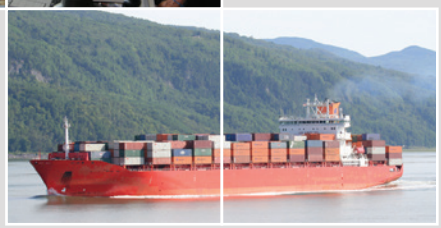

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Québec

ST. LAWRENCE Action Plan 2011-2026

Sustainable Navigation Strategy for the St. Lawrence

2004–2011 REPORT | 2012–2017 ACTION PLAN

NAVIGATION COORDINATION COMMITTEE

2021 UPDATE

Canada

Québec

This publication was created by the Navigation Coordination Committee co-chaired by the ministère des Transports du Québec and Transport Canada, and edited by the Direction des communications of the ministère des Transports du Québec.

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Message from the Co-Chairs of the St. Lawrence Action Plan 2011-2026

The St. Lawrence Action Plan is an agreement between the governments of Canada and Québec that has been in place since 1988. The goal of this collaboration is to conserve and develop the St. Lawrence and its important ecosystem. The joint projects resulting from this initiative are dedicated to reducing pollution, improving water quality, conserving, restoring and developing habitats for fauna and flora, raising awareness and involving communities, and encouraging sustainable navigation practices.

Together, the governments of Canada and Québec, the commercial and recreational marine industry and environmental stakeholders, working together as part of the Navigation Coordination Committee of the St. Lawrence Action Plan, have published the Sustainable Navigation Strategy for the St. Lawrence. Its objective is to harmonize the protection of St. Lawrence ecosystems with the needs of users and the development of the marine industry.

Since its implementation, the Strategy has, among other things, led to the development of an integrated dredging and sediment management plan. The adoption of the voluntary measure to reduce the speed of commercial vessels, aimed at mitigating the relative effects of wave action on shoreline erosion, is also a result of the Strategy. In force since 2000, the measure applies to a distance of 25 kilometres in the Sorel-Varennes sector. An information guide on marine transportation addressing the environmental and socio-economic benefits and challenges of the sector was also published as a result of the Strategy.

These results and the emergence of certain issues have led the members of the Navigation Coordination Committee to update the 2012-2017 action plan of the Sustainable Navigation Strategy action plan. By reaffirming the relevance of its actions and aiming for new results, the Strategy will continue to address the concerns of various stakeholders, such as the integrated management of dredging and sediment, management of contaminated sites, shoreline erosion, ballast water discharge, environmental risks in the event of a spill, and protection of marine mammals.

We would like to thank the members of the Navigation Coordination Committee. The Sustainable Navigation Strategy update, and the actions arising from it, demonstrate their ongoing commitment to sustainable navigation for the well-being of the ecosystems and users of the St. Lawrence River.

Jean Pruneau
Co-Chair for Canada
St. Lawrence Action Plan 2011-2026

Marc Leduc
Co-Chair for Québec
St. Lawrence Action Plan 2011-2026

Message from the Co-Chairs of the Navigation Coordination Committee

The Navigation Coordination Committee (NCC) was created in 1998 as part of Phase III of the St. Lawrence Action Plan. Its objective is to increase cooperation among stakeholders affected by navigation issues on the St. Lawrence, in accordance with the principles of sustainable development. To do so, the committee relies on the knowledge and expertise of approximately 25 members from various departments of the governments of Canada and Québec, marine and recreational boating industry associations, and environmental organizations.

Thanks to its cooperation framework, the consensus approach of its members and the strength of its network, the committee has been able to develop a common vision making sustainable navigation a priority to improve the state of the St. Lawrence. In this sense, implementation of the Sustainable Navigation Strategy for the St. Lawrence River, which began more than 15 years ago, is already well underway, thanks in part to the constant involvement of its committee members.

While the issues identified in the Strategy remain relevant, progress has been made and new common objectives have emerged in recent years. This required an update of the Strategy's 2012-2017 action plan. This update is the result of increased collaboration among committee members, experts and key stakeholders.

As co-chairs of the Navigation Coordination Committee, we are proud that our members are constantly using their expertise to preserve the diversity of ecosystems and the richness of the St. Lawrence. The evolution of the Sustainable Navigation Strategy is proof of this: it serves as a flagship document not only for members, but also for all users of the St. Lawrence.

Enjoy your reading!

Denis Simard
Québec Co-Chair
Navigation Coordination Committee
Ministère des Transports du Québec

Mélanie Morier
Co-Chair Canada
Navigation Coordination Committee
Transport Canada

Foreword

Since the release of its first edition in 2004, the Sustainable Navigation Strategy has been used by the marine community as a reference on sustainable development resulting from collaboration between governments, the marine industry, environmental organizations, riverside communities represented by ZIP (Area of Prime Concern) committees, recreational boaters and the public.

This initiative was developed by the Navigation Coordination Committee created under the St. Lawrence Action Plan, a Canada-Quebec agreement for the conservation and development of the St. Lawrence River. The objective of the first edition was to adapt the management practices of commercial and recreational navigation stakeholders in keeping with the imperatives of environmental, economic and social sustainability. It was aimed at establishing a balance between navigation practices and other uses of the St. Lawrence, as well as reconciling these different interests through consensus building.

A number of initiatives associated with the initial action plan (2004–2011) have been implemented, and the Strategy continues to inspire stakeholders to develop innovative projects. Its continuous evolution, which ensures its sustainability, is achieved through close co-operation among navigation community stakeholders and their commitment to harmonizing their actions.

The Sustainable Navigation Strategy has evolved as new concerns have emerged and therefore constitutes an example of adaptive management. This latest edition represents an updated version of the strategy that was developed in 2004, and reaffirms its objectives and underpinnings. It also provides an opportunity for the Navigation Coordination Committee to describe its own accomplishments and those of its members and other navigation stakeholders in relation to the first action plan. This document also presents the Strategy's 2012–2017 Action Plan, encompassing all the priority issues identified in the first edition of the action plan, together with a new issue — the protection of marine mammals.*

Current members of the Navigation Coordination Committee

- Canadian Coast Guard
- Canadian Power & Sail Squadrons
- Corporation of Lower St. Lawrence Pilots
- Corporation of Mid-St. Lawrence Pilots
- EcoMaris
- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- Green Marine
- Laurentian Pilotage Authority
- Marine Mammal Observation Network
- Ministère de l'Environnement et de la Lutte contre les changements climatiques du Québec
- Ministère des Forêts, de la Faune et des Parcs du Québec
- Ministère des Transports du Québec
- Ministère du Tourisme du Québec
- Montreal Port Authority
- Nautisme Québec
- Quebec Sailing Federation
- Shipping Federation of Canada
- St. Lawrence Economic Development Council
- St. Lawrence Shipoperators
- Stratégies Saint-Laurent
- Transport Canada

* It should be noted that only the full description of the 2012-2017 action plan of the Sustainable Navigation Strategy was updated in 2020. No changes were made to the preceding sections.

Sustainable Navigation Strategy

Vision

FROM SUSTAINABLE DEVELOPMENT TO SUSTAINABLE NAVIGATION

In the 1960s, population growth, increasingly dense occupation of land, accelerated extraction of raw materials and the impacts of these activities on the environment led a number of international stakeholders to begin reflecting on the social, economic and environmental sustainability of such development. Their reflection gradually intensified, culminating in the 1987 release of the World Commission on Environment and Development's Brundtland report. A simple yet complete definition of sustainable development was proposed and accepted by the international community, namely:

> ***Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.***

This definition has been used as a frame of reference by various industries, which have adapted it to their respective needs. In the transportation sector, the Organization for Economic Co-operation and Development (OECD) proposed a definition of sustainable transportation that makes no distinction between the various modes:

> ***Transportation that does not endanger public health or ecosystems and meets mobility needs consistent with:***
>
> ***a) use of renewable resources at below their rates of regeneration; and***
>
> ***b) use of non-renewable resources at below the rates of development of renewable substitutes.***
>
> (Taken from OECD Proceedings, Vancouver Conference, 1996)

These efforts resulted in the creation of the sustainable development policy framework. The framework must take into consideration three key pillars — the economy, the environment and society — and strike a balance between them.

By applying these concepts to the various navigation activities, it becomes possible to define sustainable navigation as it could pertain to the St. Lawrence:

> ***Management of commercial and recreational navigation and dockside ship operations, integrating the objectives of economic, environmental and social sustainability and assuring, in the short term and for future generations, adequate protection of ecosystems, quality of life, and human health and safety, while permitting the development of navigation.***
>
> (Navigation Coordination Committee, 2003)

This definition reflects the importance of adhering to the principles of sustainability in managing navigation activities. By making the achievement of sustainable navigation a function of management practices, the precepts of sustainability integrate seamlessly into the day-to-day activities of stakeholders and managers. Moreover, sustainable navigation subscribes to the balance sought in sustainable development, namely the prevention, mitigation or elimination of the negative impacts of commercial and recreational navigation on ecosystems and uses of the St. Lawrence. In line with and always in search of that balance, the definition highlights the beneficial environmental, social and economic aspects of navigation.

In support of this definition, the guiding principles and principles of application were developed to serve as a frame of reference for stakeholders and decision-makers who act directly or indirectly on matters affecting commercial and recreational navigation activities. In accordance with the definition, the principles constitute a vision of the St. Lawrence to be preserved by suggesting limits for navigation activities. The appropriation of this vision by decision-makers and stakeholders will foster its meaningful implementation.

GUIDING PRINCIPLES AND PRINCIPLES OF APPLICATION

The guiding principles and principles of application were defined to provide a framework for the various activities associated with navigation in order to comply with the requirements of sustainable navigation.

GUIDING PRINCIPLES

Protection of ecosystems and water resources

Assure the sustainability of the St. Lawrence ecosystems, their productivity and the essential roles they play and not disrupt the quality and quantity of water available.

Safety of persons and ships

Follow the recognized safety principles and measures for crews, users, cargo and ships.

Development of commercial navigation activities

Observe the requirements of economic development of navigation activities and assure their harmonization with environmental and social imperatives; maintain port access supporting these activities and optimize reliance on navigation in situations where this mode of transport offers comparatively more environmental gains.

Development of recreational and pleasure boating activities

Promote the development and practice of these activities and ensure their harmonization with environmental and social imperatives.

Harmonization of uses and involvement of riverside communities

Meet the needs of the different users of the St. Lawrence, particularly in matters of accessibility, and ensure the participation of riverside communities in the decision-making process.

PRINCIPLES OF APPLICATION

Broadened consensus building among navigation stakeholders

Develop and maintain consensus building among public stakeholders, users and riverside communities; and promote participation in the decision-making process based on various conditions that may range from the exchange of information to consultation and, where appropriate, the management of specific projects.

Consolidation of best practices and innovation in environmental management measures

Support and consolidate existing best practices and initiatives and develop new ones in terms of the development of knowledge, technologies and environmental conditions.

Acquisition and sharing of knowledge, and training

Promote, through research and development, the acquisition and sharing of environmental, technical and economic knowledge related to navigation; and assure the transfer of this knowledge to commercial and recreational users through training.

Dissemination of information, awareness and involvement

Disseminate information concerning the impacts and advantages of navigation to change the perceptions and behaviours of stakeholders in the navigation field, riverside communities and users; and promote the implementation of targeted strategic action.

Environmental assessment of actions

Assure systematic and regular monitoring of the environmental effectiveness of the measures implemented, and institute remedial measures as needed.

These principles are primarily based on environmental and social values, such as maintenance and development of activities with lower impact on the environment, co-operation and consensus building among the various stakeholders, but also on a marine economy based on increased efficiency of navigation activities.

In order to assess the results of the implementation of the first action plan for 2004–2011, in the next section, the Navigation Coordination Committee presents a report on its accomplishments, as well as those of its members and other stakeholders in the navigation community. Also presented are the desired outcomes for the 2012–2017 action plan of the Sustainable Navigation Strategy, encompassing all the priority issues identified in the first edition of the action plan, together with a new important issue — the protection of marine mammals.

Sustainable Navigation Strategy

2004–2011 Report and Summary of the 2012–2017 Action Plan

Note: The period covered by the report ended on November 30, 2011, at the time of the signing of a new Canada-Quebec agreement under the St. Lawrence Action Plan.

INTRODUCTION

Navigation has an impact on the St. Lawrence, just as the river's evolution affects navigation. For example, one positive development is the mandatory management of ballast water and waste water, which has reduced the impact of commercial navigation on water quality and ecosystems. Otherwise, a possible drop in water levels driven by climate change and efforts to regularize it could eventually complicate the passage of some ships through the shallower parts of the navigation channel.

The first Sustainable Navigation Strategy Action Plan (2004–2009) was extended until the fall of 2011, following a decision by the Navigation Coordination Committee to extend existing measures until a new St. Lawrence Action Plan agreement could be signed. At the end of that period, and in conjunction with the development of Phase V of the St. Lawrence Action Plan, the Committee began developing a new action plan that would cover the 2012–2017 period.

To provide proper guidance for the new action plan and assess the achievement of the desired outcomes for the 2004–2011 period, the Committee prepared a report on the first Sustainable Navigation Strategy Action Plan. For each of the issues identified in the 2004–2011 action plan, the Committee reported on the work done to date and outlined what was to be done by all stakeholders under the next action plan. Thus, for each issue, the stakeholders concerned evaluated the planned activities and placed them in one of four categories, namely:

- Action carried out and no longer included in the 2012–2017 action plan;
- Action carried out and ongoing under the 2012–2017 action plan;
- Action not carried out, but will be ongoing in the 2012–2017;
- Action not carried out and dropped from the 2012–2017 action plan.

In light of this first evaluation, the stakeholders most affected by the actions used a three-level system to evaluate the degree to which they felt they had achieved the expected outcomes:

- Expected outcomes achieved;
- Expected outcomes partly achieved;
- Expected outcomes not achieved.

Apart from the planned actions for each issue as defined in the first action plan, we would be remiss if we failed to mention the impressive progress made by the marine transportation and recreational navigation sectors in recent years with respect to reducing their environmental footprint. Although not all measures stem from the action plan, the progress made is the result of improved collaboration among St. Lawrence stakeholders. Once we have examined our progress to date, we can begin to suggest new approaches for action in support of the ongoing sustainable development of navigation on the St. Lawrence.

ISSUE 1

CONSENSUS BUILDING – A PREREQUISITE

Consensus building is a formula that makes it possible to apply the principles of sustainable development by uniting its various components — the environment, the economy and society — around a single theme. In that respect, it is a prerequisite for establishing a rationale for decisions with a collective, public impact.

Although building a consensus among the various players with diverging visions was initially challenging, the Navigation Coordination Committee's mission to define and implement the Sustainable Navigation Strategy quickly mobilized participants in their pursuit of shared objectives. The new edition of the Strategy and the development of a new Action Plan are aimed at maintaining and enhancing co-operation among river and navigation stakeholders.

The Committee's success hinges on the quality of the co-operation process, which is achieved through members' support for and compliance with the guidelines and principles of application they have devised themselves. Since 1998, Committee members have been meeting every three months to share information and report on their collective participation in the development of sustainable navigation on the St. Lawrence. The representativeness of stakeholders taking part in the group and the continuing commitment of representatives since the Committee's inception have led to some major achievements, the attainment of which has been facilitated by a cordial atmosphere of discussion and dialogue.

When the initial Sustainable Navigation Strategy Action Plan was drawn up, the Navigation Coordination Committee's goal, by means of a variety of actions, was to achieve specific outcomes relative to this issue, including:

- The involvement of community stakeholders depending on the targeted issues;
- Coordination of the Sustainable Navigation Strategy's implementation;
- Maintaining co-operation with a periodic review of the mode of operation and stakeholder integration depending on the issues.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been largely achieved.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Ensure administrative and financial monitoring of projects.		X		
Create and coordinate working groups and ensure the performance of studies and other work.		X		
Propose new projects and funding sources.		X		
Ensure the dissemination and exchange of information among the navigation stakeholders.		X		
Design communication and awareness mechanisms to efficiently reach all of the stakeholders concerned about navigation activities.		X		

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

In addition to its own actions, the Committee's innovative and productive format has inspired a number of initiatives and partnerships that have enhanced the marine community, which has become more dynamic and proactive in sustainably developing its activities.

Voluntary Marine Industry Environmental Program

The level of co-operation achieved and the exchange of information among all the players and stakeholders concerned have fostered an increased awareness within the St. Lawrence and Great Lakes marine industry of its environmental responsibility. That awareness has spurred the industry to go beyond regulatory requirements and self-regulate in a process of constant improvement and performance enhancement through a commendable initiative, Green Marine, whose success has spread beyond its initial geographical scope.

Founded in 2007, Green Marine now manages an ambitious environmental program that allows all participating marine businesses operating in Canada and the United States to take tangible steps to measurably enhance their environmental performance by means of external audits. Green Marine is now a Committee member.

Information Tour

From September 2007 to May 2008, the organization joined forces with Stratégies Saint-Laurent and local ZIP committees to visit 12 of Quebec's port cities.[1] The purpose of the tour was to explain the environmental benefits of marine transportation, as well as the constraints and challenges it faces. In addition to local media, the conferences attracted representatives from about 200 organizations. This communication activity is one of the best examples of the strength of co-operation within the Committee and its cohesion in raising public awareness of the marine industry's commitment to sustainable development.

Navigation and Young Mariners' Week

In September 2008, Les Amis de la vallée du Saint-Laurent also launched Navigation and Young Mariners' Week. This new project consisted of inviting participants to attend information sessions, activities held aboard ships and some 20 lectures. The event enjoyed the support and collaboration of 38 organizations, the vast majority of which are in the marine industry.

The initiative spawned an annual marine career fair organized by the Comité sectoriel de main-d'œuvre de l'industrie maritime: Salon des carrières maritimes. In October of each year, the public is invited to learn more about the marine world and the jobs available in the industry. Hands-on workshops, conferences and ship tours are offered to participants of all ages. Particular effort is made to promote the industry to high school and college students to make them aware of career opportunities in the field.

Summary of the 2012–2017 Action Plan

With this new edition of the strategy, the time has come for Navigation Coordination Committee members to renew their commitment to enhancing consensus building. The Committee's goals in implementing the new Action Plan are to:

- Involve community stakeholders depending on the targeted issues;
- Develop and implement the Sustainable Navigation Strategy;
- Maintain co-operation, with a review of the mode of operation and the integration of stakeholders depending on the issues.

1. Baie-Comeau, Sept-Îles, Salaberry-de-Valleyfield, the city of Québec, Sorel-Tracy, Rimouski, Matane, Gaspé, Saguenay, Montréal, Trois-Rivières and Bécancour.

ISSUE 2

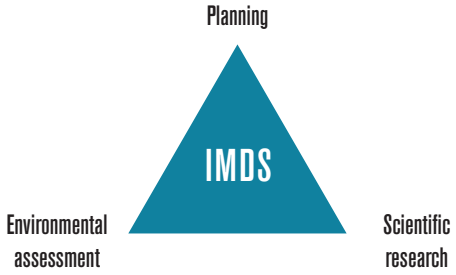
IMPLEMENTATION OF INTEGRATED MANAGEMENT OF DREDGING AND SEDIMENTS

When performed in a navigation context, dredging is an activity whereby naturally deposited sediment is removed from the bottom of rivers to ensure continued safe navigation. Integrated dredging and sediment management, an important element of the Sustainable Navigation Strategy, strives to take into account the entire dredging activity cycle, from material removal through to disposal, including the study of potential environmental effects.

In March 2004, an integrated management plan was developed by the Working Group on the Integrated Management of Dredging and Sediment (WGIMDS). This working group, set up by the Navigation Coordination Committee, brought together government specialists from a variety of federal and provincial departments involved in the management and environmental assessment of dredging operations. Under the plan, the Working Group proposed a general guidance framework based on the following objectives:

- The integration of environmental, economic, social and institutional requirements into dredging operations;
- The creation of tools to facilitate decision-making and improve communications with proponents, non-governmental organizations and the public.

Three focus areas have been put forward:



In addition to the integrated management plan, a series of 17 recommendations completed and set out the actions to be taken within the context of the Sustainable Navigation Strategy. Consequently, when developing the first action plan for the Strategy, the Committee strove to achieve clearly defined results for this major issue, including the following:

- Improved planning mechanisms relative to dredging operations, maintenance and capitalization and disposal, in conjunction with industry stakeholders;
- Improved institutional co-operation in the context of dredging project development and authorization processes;
- Reduced scientific uncertainty relative to dredging and sediment disposal.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been largely achieved.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Set up the management structure (planning, environmental assessment, research and development).	X			
Give priority to and implement the recommendations of the dredging and sediment management working group.		X		

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Accomplishments of the Dredging Planning and Environmental Assessment Committee and Dredging Research Consultative Committee

Some of the recommendations of the Working Group on the Integrated Management of Dredging and Sediments involved the establishment of committees to address the three focus areas of the integrated management plan. As a result, the Dredging Planning and Environmental Assessment Committee (DPEAC) was created in 2004 and the Dredging Research Consultative Committee (DRCC), in 2006. These two stand-alone consultative committees and their working sub-committees set to work implementing the plan's various recommendations. Their key accomplishments include:

- In 2008, implementation of the recommendations set out in the document *Criteria for the Assessment of Sediment Quality in Quebec and Application Framework: Prevention, Dredging and Remediation*[2] (revision of 1992 criteria).
- Establishment of a process for assessing the ecotoxicological risks associated with contaminated sediment. The process was developed based on the findings of a number of ecotoxicological studies conducted in several freshwater areas of the St. Lawrence. The studies made it possible to identify appropriate toxicity tests and set out protocols for the analysis of benthic communities. The findings, which were published in a number of scientific papers and presented at conferences, point to the presence of sulphur as a confounding factor in toxicity.

2. Document available on the St. Lawrence Action Plan website at www.planstlaurent.qc.ca.

- Development, online launch (September 2009) and promotion of the Dredging Activities Planning Registry.[3] Using a website, the key objective of the Registry is to improve the management of dredging activities in Quebec by facilitating their long-term planning.
- Study of the problem of dioxin and furan toxic equivalents.
- Study of toxicity in highly compacted sediment such as clay.

Accomplishments of the Integrated Dredging and Sediment Management Committee

Ocean Group

In order to continue implementing the various recommendations of the integrated management plan and before undertaking activities related to Phase V of the St. Lawrence Action Plan, the operations, mandate and priorities of the Dredging Planning and Environmental Assessment Committee and the Dredging Research Consultative Committee had to be redefined. An exercise involving a number of workshops led to the creation of a new committee, the Integrated Dredging and Sediment Management Committee (IDSMC), to replace the two above-mentioned committees. The new committee remains active, and its mandate is to continue to improve the management of dredging activities for the protection of ecosystems and public health while allowing for the development of navigation on the St. Lawrence. The Committee held its first meeting in Montréal on June 7, 2011. A guidance document on the Committee's governance was produced in December 2011.

A number of projects initiated in the previous phase, Phase IV of the St. Lawrence Action Plan, will be completed during the first few years of the current phase, Phase V. In most cases, these are guides and management documents produced in recent years that will be finalized and posted on the Dredging Activities Planning Registry website. Here are the achievements to date:

- Establishment of an ecotoxicological risk assessment procedure — explanatory booklet for performing and interpreting the recommended bioassays for the ecotoxicological assessment of freshwater sediment, *Hyalella* and *Chironomus* (2012).
- Guide for the development of environmental monitoring and follow-up programs for dredging and sediment management projects (2015).
- Guide to physicochemical and toxicological characterization of sediment (2016).
- Recommendations for suspended solids during dredging activities (2016).
- Assessing sediment toxicity in the upper St. Lawrence estuary (2017).

3. The St. Lawrence Dredging Activities Planning Registry is available on the St. Lawrence Action Plan website at www.planstlaurent.qc.ca (in French only).

- **Summary of the 2012–2017 Action Plan**

With a view to continuing to protect ecosystems and public health while allowing for the development of navigation on the St. Lawrence, the Committee, through the Integrated Dredging and Sediment Management Committee, will continue implementing the new Action Plan for the Strategy. This includes:

- Better integration of dredging and sediment management activities in the St. Lawrence through:
  - Improved communications among the various stakeholders in the dredging field;
  - Effective environmental planning and assessment for dredging projects;
  - Proper application of federal and provincial criteria, acts and regulations pertaining to dredging and sediment management;
  - The most reliable possible assessment of the toxic effects of contaminated sediment on the biota;
  - Use of the best management and disposal options for sediment depending on the contamination level, including beneficial uses of mildly contaminated or uncontaminated sediment.

ISSUE 3

EVALUATION OF ADAPTATION OPTIONS FOR NAVIGATION WITH RESPECT TO FLUCTUATING WATER LEVELS

Water flow and levels in the St. Lawrence vary daily, seasonally and from year to year in accordance with weather conditions (rain, wind, snow, air and water temperature), regulation exercises (Plan 1958-DD) carried out by the International St. Lawrence River Board of Control and, in the longer term, as a result of climate change.

Since the early 1960s, regulatory facilities upstream from Montréal, including the main one near Cornwall, Ontario and Massena, New York, have helped to limit seasonal fluctuations in water levels while ensuring adequate commercial navigation depths at Montréal dependable flow for hydroelectric generation, and protection for riverside and other interests downstream in the province of Quebec. However, the facilities operate at their limits when climate cycles cause years of very low or very high precipitation over long periods, leading to major fluctuations in water levels, both upward and downward.

Historically, water levels in the St. Lawrence have undergone cyclical variations, with periods of higher-than-average and lower-than-average levels. Periods of very low water levels were recorded in the 1930s and early 1960s, and very high levels were experienced in the 1970s. Several years of low levels have also been observed since the early 1990s, which is worrisome.

The results of predictive modelling of the effects of climate change on water levels would seem to indicate that flow will decrease through the St. Lawrence-Great Lakes system and that the drop in water levels observed since the early 1990s may continue. It is possible that despite future regulation efforts, the drop in the river's water levels may cause a number of changes to commercial and recreational activities, short and long cruises (river, excursion and international cruises), along with a number of municipal water intakes.

Although predictive modelling involves a considerable margin of error, the fact remains that there is potential to develop strategies for adapting to these changes that will allow activities to continue at their present levels while limiting the environmental impact. The work planned by the Navigation Coordination Committee as part of the initial Sustainable Navigation Strategy Action Plan was aimed at achieving the following results with respect to assessing the navigation adaptation options in response to fluctuating water levels:

- Mitigating the effects of fluctuations in St. Lawrence River water levels on commercial and recreational navigation and short and long cruises;
- Documenting adaptation options for the St. Lawrence that are economically and environmentally acceptable.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee feels that the desired outcomes for this issue have been achieved.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Produce adaptation scenarios that exclude a physical modification of the St. Lawrence and others that include it, to ensure the transport of cargo and passengers.	X			
Improve models for predicting the water level usable for commercial shipping (under keel clearance).		X		
Study the possibility of reorganizing marine transportation, intermodal and port collaboration in a context of low water levels and competition.	X			
Evaluate the possibilities of capital dredging at certain strategic points in the navigation channel.	X			
Ensure consensus validation of the results by Committee members.	X			
Ensure follow-up on the studies of the International Joint Commission regarding this sector.		X		
Support the development of a common position on water needs for the St. Lawrence.		X		
Ensure the integration of the problem of water levels into integrated dredging management.				X

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Studies

During the period covered by the first Action Plan, a variety of initiatives were carried out to document possible adaptation options with regard to the problem of fluctuating water levels in the St. Lawrence over the next 50 years, including:

- A study of the impact of climate change on water levels in the St. Lawrence, carried out by Fisheries and Oceans Canada on behalf of the Navigation Coordination Committee, entitled *Effet des changements climatiques sur les niveaux d'eau du fleuve Saint-Laurent entre Montréal et Québec: projections pour les années 2050*. (Lefaivre, D., 2005);
- A study carried out for the committee on climate change and marine transportation on the St. Lawrence, entitled *Changements climatiques et transport maritime sur le Saint-Laurent. Étude exploratoire d'options d'adaptation*. (D'Arcy et al., 2005).

By using a digital hydraulic model, simulations were carried out to estimate the drop in water levels in the segment of the St. Lawrence Seaway between Montréal and the city of Québec that could occur between now and 2050 (Lefaivre, D., 2005). These simulations, run using a variety of temperature and humidity scenarios, showed that if average hydrological conditions were maintained, the anticipated drop in water levels would not impede commercial shipping. However, in a scenario involving low hydraulicity (most pessimistic scenario), the decline could be as much as one metre below chart levels in Montréal for several consecutive months, while the drop would be about 30 cm in Trois-Rivières. In that scenario, the decline at Bécancour would be less than 10 cm (D'Arcy et al., 2005).

In the latter study, the researcher explored a variety of adaptation measures to address anticipated water level decline in the fluvial portion of the St. Lawrence by 2050. Some of the methods were suggested based on the magnitude of the potential decline in water levels.

Summary of the 2012–2017 Action Plan

With a view to maintaining commercial shipping and recreational boating in the long term, at least at their current levels, Committee members will be working toward that goal by means of the implementation of the new Sustainable Navigation Strategy Action Plan, which is to:

- Mitigate the impact of water level fluctuations in the St. Lawrence River on commercial shipping, recreational boating and cruise activities.

ISSUE 4

RELATIVE EFFECT OF THE WAKE PRODUCED BY SHIPS AND PLEASURE CRAFT, ONE OF THE ELEMENTS OF THE PHENOMENON OF EROSION EXAMINED IN SOME SECTORS OF THE ST. LAWRENCE

Erosion is a phenomenon that affects all waterways and its causes are numerous. Wake is the beating of waves against the shores of a waterway that is produced by the deadwater of ships and pleasure craft and causes shoreline erosion. The magnitude of the wake varies depending on the size of the ship, the shape of its hull, its draught, its speed and the characteristics of the channel through which it is travelling.

St. Lawrence Shipoperators

Wake is one of the elements examined in the phenomenon of the erosion of the St. Lawrence shoreline in the section between Montréal and Sorel. For this reason, the marine industry instituted a voluntary speed-reduction measure for commercial vessels in fall 2000. The measure covers a stretch of river nearly 25 km in length in the Sorel-Varennes sector and is a strong incentive for ship pilots to keep their speed below 10 knots (18.5 km/hr) relative to bottom when travelling upstream and 14 knots (25.9 km/hr) downstream, at a speed of 12 knots (22.2 km/hr) relative to the water. Speeds were established by taking into account a number of safety factors, including ship manoeuvrability. Since its entry into force, a large proportion of marine industry players have complied with this voluntary measure.

Although this commendable initiative on the part of the marine industry has contributed to reducing wake damage, the Committee, by means of the initial Sustainable Navigation Strategy Action Plan, wanted to pursue efforts to address this major issue. Consequently, the planned actions were aimed at achieving the following targeted results:

- A review of environmental effectiveness of the voluntary speed reduction measure for commercial shipping;
- Improved knowledge of the relative effect of wake of pleasure craft.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been partially achieved.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Maintain the current speed reduction measure in the Sorel Islands-Varennes sector.		X		
Continue analyzing the voluntary speed reduction measure for commercial vessels with respect to its effectiveness in reducing shoreline erosion.	X			
Continue monitoring compliance with the voluntary speed reduction measure for commercial vessels.		X		
Document the relative effect of wake of pleasure craft on shoreline erosion.			X	
Document the impact of wake produced by ships on human safety.				X
Provide recreational boaters with awareness tools.		X		

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Environmental Monitoring of the Voluntary Speed Reduction Measure for Commercial Vessels

A study on freshwater shoreline erosion in the section of the St. Lawrence between Lake Saint-Louis and the municipality of Saint-Pierre-les-Becquets was recently conducted based on data collected between 1998 and 2008 (Richard, L-F., 2010). The study, whose objective was to analyze the effectiveness of the voluntary speed reduction measure for commercial vessels in preventing shoreline erosion, compared shoreline recession in the zone where the speed reduction measure is in effect to that in areas where no such measure is in place. Although the comparison involves only a short period of observation (two years prior to the application of the measure and five years after), the study shows that speed reduction does help to reduce erosion. However, variations in water levels in the St. Lawrence also play a major part. In 2006–2007, for instance, when average water levels in the river were very high, there was no decrease in the rate of shoreline recession.

Today, the voluntary speed reduction measure for commercial vessels remains in effect and the vast majority of ships comply with it. Transport Canada continues to collect data on vessel compliance with the voluntary measure of speed reduction.

Guide for Recreational Boaters

To raise awareness among recreational boaters of the importance of protecting waterways and the impact of shoreline erosion on plant and animal species, Transport Canada, Quebec Region developed a user's guide for recreational boaters entitled *Protecting Quebec's Waterways* (TP 14761). The guide urges recreational boaters to reduce their crafts' wake. By reducing their speed and keeping as far as possible from the shoreline, recreational boaters can help to reduce shoreline erosion.

St. Lawrence Shipoperators

Summary of the 2012–2017 Action Plan

In order to mitigate the relative effect of the wake of commercial ships and pleasure craft on erosion, the Navigation Coordination Committee seeks to, in the implementation of the new Sustainable Navigation Strategy Action Plan,

- Improve knowledge of the relative effect of the wake of commercial vessels and pleasure craft on erosion;
- Carry out research on the phenomenon of erosion (conditional upon obtaining funding);
- Maintain high level of compliance with the voluntary speed reduction measure for commercial vessels.

ISSUE 5

IMPROVEMENT OF THE MANAGEMENT OF SEWAGE DISCHARGES AND CARGO RESIDUES FOR ALL TYPES OF SHIPS AND CRAFT

Sewage and grey water

In Transport Canada regulations, sewage refers to all drainage and other wastes from toilets and other receptacles intended to receive or retain human body wastes and drainage from medical premises (dispensaries, infirmaries, etc). Grey water is defined as drainage from the normal use of sinks, laundry machines, bathtubs, shower stalls or dishwashers.

Discharge of liquid waste produced by commercial vessels and pleasure craft can lead to bacterial pollution, including pathogens. To improve the management of sewage and reduce the considerable environmental impact associated with the practice, the objectives of the initial Sustainable Navigation Strategy Action Plan were aimed at improving control of sewage discharge from all types of ships and pleasure craft.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been largely achieved.

Cargo residues

Ore, grain and other materials are loaded into the holds of cargo vessels and can leave behind cargo residues. When a ship changes cargo type, the holds are cleaned, meaning that they are swept and washed with water to avoid possible cross-cargo contamination. In some circumstances, it is permissible to discharge hold sweepings and wash water into the sea.

No data exist concerning the quantitative significance of this practice on the St. Lawrence, but the toxicity level of certain materials and the disruption of wildlife habitats by the accumulation of deposits have compelled the authorities to regulate this practice to mitigate its impacts. When the first Action Plan was drawn up, the Committee's goal was to achieve more environmentally friendly management of the bulk cargo residues of ships.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been largely achieved.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Inventory polluting materials.	X			
Inventory collection and treatment systems.		X		
Draft and implement control procedures.	X			
Harmonize management of discharges of sewage and cargo residues with Great Lakes practices.	X			

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Regulatory Measures — Ship and Pleasure Craft Sewage

By means of a number of different measures, Committee members contributed to advancing regulations on ship and pleasure craft sewage. At the same time, they worked together to develop and implement monitoring procedures. Since the Sustainable Navigation Strategy was first published, regulations on the discharge of sewage have been amended twice. First, on May 3, 2007, the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* (SOR/2007-86) took effect. Then, on March 30, 2012, the latter regulations were superseded by the *Vessel Pollution and Dangerous Chemicals Regulations (SOR/2012-69)*[4]. The most recent changes made it possible to harmonize the 2007 regulations with the *Canada Shipping Act, 2001*, which came into force on July 1, 2007. Despite the fact that the 2012 regulations do not include any major changes, they do provide a few clarifications regarding the discharge of sewage and cargo residue.

Since May 3, 2007, sewage regulations have covered all Canadian waters, including those downstream from the Saint-Lambert locks. The harmonization of sewage management rules with those of the Great Lakes was one of the Committee's longstanding requests. From now on, discharge from commercial vessels and pleasure craft is only allowed under certain clearly defined conditions. To ensure a high level of compliance, efforts are being made to promote regulations to recreational boaters, fishers' associations and the marine industry.

Guidelines – Grey Water from Cruise Vessels

In 2003, Transport Canada published its *Pollution Prevention Guidelines for the Operation of Cruise Ships under Canadian Jurisdiction* (TP 14202)[5] for large cruise vessels. In 2009, the third edition of the guidelines was published, making it possible to introduce the requirements of the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* (SOR/2007-86). The guidelines include practices that the cruise ship operators have agreed to follow that exceed current regulatory requirements. This includes procedures for grey water. Grey water management is expected to be included in future regulations.

4. *Vessel Pollution and Dangerous Chemicals Regulations* is available on the Justice Canada website at www.justice.gc.ca under "Laws".

5. *Pollution Prevention Guidelines for the Operation of Cruise Ships Under Canadian Jurisdiction* (TP 14202) is available on the Transport Canada website at www.tc.gc.ca.

Regulations and Study – Cargo Residues

St. Lawrence Shipoperators

Since 2004, discharges of cargo residues have been governed by the provisional guidelines for the discharge of non-harmful cargo residues into the St. Lawrence and Saguenay rivers (*Lignes directrices provisoires pour la disposition des résidus non nocifs de cargaison dans le Saint-Laurent et le Saguenay*). The rules for discharge set out in these directives were included in section 5 of SOR/2007-86, then in the *Vessel Pollution and Dangerous Chemicals Regulations* (SOR/2012-69). A new concept was introduced into the latter regulations, allowing for discharge "only if all reasonable efforts have been made to empty the cargo hold of the cargo residues and to reclaim any cargo residues that are on the vessel." The regulations set out an exhaustive list of the types of cargo for which residue discharge is allowed in the St. Lawrence.

In 2008, for regulatory reform purposes, Transport Canada commissioned a study from the Maritime Innovation research centre on the discharge of cargo residues. The study provided an overall picture of the situation on the St. Lawrence by identifying the types of loose freight carried by ships on the St. Lawrence and hold cleaning methods. It also examined the potential environmental impact of cargo residue discharges in an aquatic environment.

Voluntary Measures by the Commercial Marine Industry

While the Government of Canada tightened its regulations to limit pollution by vessels, Green Marine encouraged its participants to take additional voluntary measures to reduce the commercial marine industry's environmental footprint even further. Suggested measures include sweeping cargo residues on ship decks and disposing of them dockside, reducing the amount of water used to rinse down holds, modifying the unloading capacity to minimize losses, and improving coordination and communication between crew members during unloading operations.

Green Marine's ports and terminal operator members are also making every effort to reduce cargo residue discharges and spills. Among the best practices adopted, there is sweeping and disposal of residues and the adoption of adequate measures to prevent water contamination, in part through the use of protective tarps. The companies concerned are then encouraged to develop water and soil pollution prevention plans, establish a preventive maintenance schedule for equipment and invest in sophisticated equipment for reducing dust emissions.

Summary of the 2012–2017 Action Plan

Although the various regulatory and voluntary measures put in place are aimed at solving the problem related to this issue, the Committee, as part of the new Sustainable Navigation Strategy Action Plan, seeks to:

- Evaluate the impact of the new regulations;
- Coordinate efforts to facilitate compliance with the new regulatory requirements for sewage discharge by pleasure craft.

ISSUE 6

REDUCTION OF RISKS OF INTRODUCTION AND SPREAD OF EXOTIC ORGANISMS BY BALLAST WATER FOR ALL TYPES OF SHIPS AND PLEASURE CRAFT

Ships began using water as ballast in the 19th century to improve their stability and allow for safer navigation. However, that water must be discharged while in port to allow for cargo loading, and this carries some risk in terms of introducing exotic species. Some organisms introduced are invasive, that is, they reproduce in an uncontrolled manner in the absence of their natural predators and can destroy indigenous habitats and species.

The numbers are startling: In the St. Lawrence-Great Lakes system, over 180 species have been introduced in the past two centuries, 88 of which ended up in the St. Lawrence.[6] While a number of vectors of introduction have been identified, commercial navigation is the vector that, by virtue of its operations, has contributed most significantly to the current problem. For years, the focus of prevention strategies was the risk of exotic species being introduced by ocean-going vessels. More recently, the focus has broadened to include the spread of exotic organisms by domestic vessels, pleasure craft and discharge from aquaculture operations (e.g. the Asian carp) and aquariums.

Because marine transportation was identified as a vector for the spread of aquatic species worldwide, with serious environmental and economic consequences, the Navigation Coordination Committee's focus in the first Sustainable Navigation Strategy Action Plan was on substantially reducing the risk of introducing exotic species, thus ensuring sustainable navigation.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been largely achieved.

6. Presentation by Yves de Lafontaine, Section Head, Aquatic Biodiversity, Environment Canada at the Green Marine environmental conference, GreenTech 2010.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Ensure compliance with the guidelines in place in the first Action Plan.	X			
Increase awareness among recreational boaters and the shipping industry of the problem of dissemination.		X		
Monitor the effectiveness of ballast water exchange during inspections in port areas.		X		
Establish a decision support model for exchanges in the alternative exchange zone (the Laurentian Channel).	X			
Monitor the effectiveness of new control methods (treatment and screening).		X		

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Regulatory Measures

By means of a variety of initiatives, the Committee's members supported the development of regulations to reduce the risk of the introduction and spread of exotic organisms by vessels and pleasure craft. As with sewage, regulations on ballast water have been amended twice since the publication of the Sustainable Navigation Strategy. In June 2006, the *Ballast Water Control and Management Regulations,* adopted under the *Canada Shipping Act* (R.S.C., 1985, c. S-9) came into force. In parallel with the regulations, the *Guidelines for the Control of Ballast Water Discharge from Ships in Waters Under Canadian Jurisdiction*, which had been applied on a voluntary basis since 2000, became *A Guide to Canada's Ballast Water Control and Management Regulations* (TP 13617 E).[7]

7. *A Guide to Canada's Ballast Water Control and Management Regulations* (TP 13617 E) is available on the Transport Canada website at www.tc.gc.ca.

In order to bring the 2006 Regulations into line with the *Canada Shipping Act, 2001*, SOR/2006-129 was repealed to make way for the *Ballast Water Control and Management Regulations (SOR/2011-237)*[8], which came into force on October 27, 2011. Unlike the guidelines, which were applied solely on a voluntary basis, Canadian regulations require Canadian vessels and those navigating waters under Canadian jurisdiction to comply with ballast water control and management requirements. Transport Canada is responsible for enforcing compliance, in part by conducting ship inspections and monitoring all ballast reports.

In recent years, ballast inspections have begun to be carried out on all ships coming into the Great Lakes from abroad, or about 400 vessels per year, in addition to the inspection of a hundred ships destined for Quebec. Monitoring in the form of inspections is indisputably a powerful incentive; this is why non-compliance rates are lower in areas where all ships are inspected. For the Great Lakes basin, there has been a marked decrease in the introduction of exotic aquatic organisms by vessels since the ballast water management program was instituted (regulation, monitoring, inspection). Consequently, the number of new species introduced has dropped since 2004. Moreover, no new introductions have been reported since 2006.

International Convention

On July 8, 2010, Canada became a signatory of the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The Convention will take effect 12 months after 30 countries, representing 35% of the gross tonnage of the world merchant shipping, have ratified it. Amendments to the *Ballast Water Control and Management Regulations* (SOR/2011-237) are actually expected in the coming years to incorporate the provisions of the Convention. Because ballast water management as currently prescribed does not provide complete protection against this type of invasion[9], the Convention adds to ballast water requirements by requiring the installation of ballast water treatment systems.

8. *The Ballast Water Control and Management Regulations* (SOR/2011-237) are available on the Justice Canada website at www.justice.gc.ca.

9. Evaluating Efficacy of an Environmental Policy to Prevent Biological Invasions. *Environmental Science & Technology*. 2011, 45, 2554–2561.

Voluntary Measures by the Commercial Shipping Industry

As a result of awareness efforts directed at the commercial shipping industry, some associations stand out in their efforts to bring their ships into regulatory compliance. In recent years, the Shipping Federation of Canada, the association representing ship owners and shipping agents engaged in international trade in Canada, has put in place a number of initiatives to facilitate regulatory compliance among its members. These include a Code of Best Practices for Ballast Water Management (developed in 2000 and subsequently incorporated into regulations in 2006 and 2011) and guidelines sent to ships' captains to facilitate regulatory compliance. In addition, the Federation has developed training on regulatory requirements that is offered in a number of Canadian cities where Federation members operate.

Since its launch in 2007, Green Marine, through its voluntary environmental program for the Canadian and US shipping industries, has made the introduction of exotic species through ballast water a priority issue. The measures suggested by the program include applying sound management practices, keeping a record of the quantity of ballast water taken on and discharged, as well as a non-compliance log, and participation in new management tool and processing system sampling, research and development programs. In addition, Green Marine already recognizes the initiatives of ship owners who test or install new ballast water processing systems aboard their ships.

Guide for Recreational Boaters

The *Protecting Quebec's Waterways* guide is aimed at raising awareness among recreational boaters of the risk inherent in navigation of spreading invasive exotic species. The guide sets out a number of simple actions boaters can take between the time they take their boat out of the water and its next launch. The adoption of responsible behaviours on the part of recreational boaters will allow greater protection of our bodies of water.

Summary of the 2012–2017 Action Plan

Despite the fact that regulatory measures have been instituted to reduce the risk of exotic species being introduced and spread by vessels and pleasure craft, efforts aimed at improving the current practices of recreational boaters will have to be maintained. By implementing the new Sustainable Navigation Strategy Action Plan, the Navigation Coordination Committee aims to:

- Continue efforts to reduce the risk of introducing exotic species by all types of vessels, including pleasure craft.

ISSUE 7

HAZARDOUS PRODUCT AND OIL SPILL PREVENTION AND RESPONSE

Safe marine transportation, particularly of oil, is based on a management system that includes multiple variables. The system encompasses the management of ships, their equipment and their operations. This management is based on formal procedures for the inspection of Canadian and foreign ships, waterway management, marine communication and traffic services and other security-related services (e.g. de-icing, piloting, towing), classification societies and insurers. In addition to this well-regulated system, companies often implement voluntary best practices to prevent incidents.

Thanks to the various preventive measures put in place, the St. Lawrence has been relatively spared from major spills in terms of the number of tonnes spilled in recent decades. Most, if not all, hazardous product and oil spills occur during dockside transfer operations. It is true that the risk is higher in port because of the handling of hazardous materials. Because of this, oil and liquid bulk terminals have anti-pollution equipment in place and have drawn up response plans allowing them to respond quickly to spills and minimize their environmental impact.

The dynamic would be different if a major hazardous product or oil spill were to occur as a result of a ship collision, grounding or breakdown. The response could take longer, the geographical area affected by the spill might be more extensive, the risk of environmental damage higher and response measures lengthier and more complex. As a matter of fact, the effects of a single spill may be felt in many ways and may have a lasting impact.

Because the environmental, social and economic consequences of a spill can be disastrous, prevention and response optimization efforts for dealing with hazardous product and oil spills must be maintained over time. The Navigation Coordination Committee, by means of the first Sustainable Navigation Strategy Action Plan, sought to work collaboratively on this issue, which could have serious repercussions for the public. Consequently, the planned actions were aimed at achieving the following result:

- Greater co-operation from riverside communities, under the supervision of emergency response specialists, to mitigate damage caused by spills;
- Support from the authorities concerned to develop training programs for volunteers;
- Improved environmental knowledge of spilled products to reduce health risks.

Following its assessment of the various actions set out in the 2004–2011 Action Plan, the Navigation Coordination Committee is of the opinion that the desired outcomes have been partially achieved.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Ensure adequate training, in accordance with occupational health and safety standards, for riverside communities.			X	
Offer the communities a forum where emergency response priorities can be established.		X		
Increase riverside municipalities' awareness of the risk factor presented by a marine spill and the importance of adopting an emergency plan.		X		
Improve winter emergency response methods.		X		
Support the preventive measures in force and promote them to all stakeholders in the navigation field.		X		
Verify the applicability of burning as an emergency response method on the St. Lawrence.		X		
Document the residual risks relating to consumption of resources after a spill.				X

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Review of Operating Procedures in Case of a Marine Incident

During the period covered by the initial Action Plan for the Strategy, a working group composed of representatives of the Canadian Coast Guard, and the Quebec departments of Public Security and Sustainable Development, Environment, Wildlife and Parks drew up and adopted new guidelines on provincial operating procedures for responding to a marine incident with the potential to damage the environment or compromise public safety and security. To improve communications among stakeholders and ensure a rapid, coordinated and effective response, the guidelines eliminate all ambiguity among stakeholders from the various levels of government by standardizing the procedure and distributing it to all the organizations involved, which are then able to incorporate it into their marine response plans.

At the same time, Transport Canada, in conjunction with the Canadian Coast Guard, drew up and adopted the *Exceptional Marine Occurrence Management Guide* (April 2005). This guide to managing exceptional marine occurrences sets out the roles and responsibilities of each department when efforts have to be coordinated and includes procedures for evaluating situations involving risks.

Transport Canada also updated its *Marine Safety Response Guide* based on the lessons learned during incident management, such as the November 1999 grounding of the *Alcor*, and in accordance with recommendations by the Transportation Safety Board of Canada. The guide sets out response authority, objectives, safety actions and information required, as well as measures to be taken by Transport Canada staff in a marine emergency.

Response Capacity in Winter Conditions

During the same period, the Canadian Coast Guard conducted a research and development project aimed at improving the organization's capacity for responding to oil spills, particularly in the presence of ice. Carried out in partnership with the Centre for Offshore Oil, Gas and Energy Research (COOGER) at École Polytechnique de Montréal, the project's aim was to assess the effectiveness of using fine-grained clay minerals as a natural dispersant of oil trapped in the ice. When completed, the project made it possible to set out the guiding principles for a response procedure using natural dispersants for oil spills in ice-choked waters.

In keeping with the objective of boosting its winter-conditions response capacity, the Canadian Coast Guard teamed up with East Canada Response Corporation (ECRC), a marine response organization certified by Transport Canada for the Quebec region to purchase specialized equipment for oil recovery under such conditions.

Transport Canada has been proactive in its monitoring of winter navigation and its efforts to raise awareness among ship operators of the challenges associated with winter navigation.

Summary of the 2012–2017 Action Plan

To ensure optimal prevention and response to hazardous product and oil spills, the results sought by the Navigation Coordination Committee and the actions stemming from them are primarily centred on risk management. With the implementation of the new Sustainable Navigation Strategy Action Plan, the Committee seeks to:

- Support the authorities concerned to ensure that riverside communities adopt a marine emergency response plan;
- Monitor the reform of Canada's National Oil Spill Preparedness and Response Regime;
- Monitor the development and implementation of a preparedness and response plan for ship-caused incidents involving toxic and potentially dangerous substances;
- Establish a shared understanding of the risks associated with the shipping of oil and hazardous products within a context of potential supply diversification.

ISSUE 8

DEVELOPMENT OF MARINE TRANSPORTATION IN RELATION TO ITS ENVIRONMENTAL AND SOCIAL BENEFITS

The issues listed above have allowed us to define certain actual or potential environmental pressures occasioned by navigation activities on the St. Lawrence ecosystems. However, marine transportation does not only involve negative environmental aspects. Progress has been made in recent years by stakeholders in the marine transportation and recreational boating sectors with respect to their environmental footprints. Updating the Sustainable Navigation Strategy has made it possible to identify a number of initiatives affecting such varied aspects as regulations, research, awareness of the various players and the implementation of voluntary measures by the commercial marine industry.

Since 2004, the navigation community has experienced a number of positive changes. Studies have already proven the environmental benefits (greenhouse gas emissions, spill frequency) and social benefits (road congestion, high road network maintenance costs, accident rate) of marine transportation over other modes. The Navigation Coordination Committee, in developing the initial Action Plan for the Strategy, wanted to promote and optimize the use of marine transportation in situations where it offers greater environmental benefits than the other transportation modes.

Following its assessment of the single action set out in the 2004–2011 Action Plan, and thanks to sustained effort, the Navigation Coordination Committee is of the opinion that this result has been achieved, although much work remains to be done.

Report on planned actions from the 2004–2011 Action Plan

PLANNED ACTION	ACTION CARRIED OUT		ACTION NOT CARRIED OUT	
	Completed	Ongoing	Ongoing	Withdrawn
Raise awareness among decision-makers and stakeholders of the environmental benefits of marine transportation.		X		

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Creation of a Working Group Within the Navigation Coordination Committee

The Committee set up and coordinated a working group to develop and publish a document on navigation on the St. Lawrence. The purpose of the document is to inform the general public about commercial and recreational navigation on the St. Lawrence as they relate to the three focus areas of sustainable development. Among other things, this awareness tool communicates some of the benefits of marine transportation in terms of the environmental and social impact of transportation activities. The Committee hopes that the document to be published in late 2014, will showcase the contribution of marine transportation on the St. Lawrence to Quebec's culture and heritage.

Creation of the Quebec Shortsea Shipping Round Table

In fall 2001, the Marine Industry Forum, created through the joint efforts of the Government of Quebec and the marine industry, set up a working group to examine the shortsea shipping sector, evaluate approaches for the development of this industry segment and make recommendations on the subject.

Adopted by the Forum in March 2003, one of the report's recommendations was that a permanent round table be set up to ensure follow-up on its work. The Quebec Shortsea Shipping Round Table began operating in the spring of 2004. Since its inception, the Table's management and coordination have been entrusted to the St. Lawrence Shipoperators.

The Table's goal is to support the development of shortsea shipping services with a destination within Quebec. It plans to do so by acting as an information and expertise hub and promoting the integration of marine transportation into national and continental transportation chains. The ministère des Transports du Québec, the St. Lawrence Shipoperators and Hydro-Québec recently funded a feasibility study on marine cargo transport to the North Shore, entitled Étude de faisabilité pour un service de transport maritime de marchandises vers la Côte-Nord.[10]

10. The feasibility study on marine cargo transport to the North Shore is available (in French only) on the ministère des Transports du Québec website at www.mtq.gouv.qc.ca.

Financial Assistance Programs

The ministère des Transports du Québec is directly involved in marine shipping. Its key actions are aimed at fostering the development of a marine shipping system in a perspective of competitiveness, modal integration, development of the St. Lawrence and sustainable development.

In 2001, to facilitate the achievement of its goals, the Department set up a number of financial assistance programs whose key objectives were to support the implementation of projects that promote greater integration of marine shipping into the supply chain and reduce the environmental and social impact of transportation activities, particularly with respect to greenhouse gas emissions.

Through these financial contributions, the ministère des Transports du Québec has supported a number of marine transportation projects, thus fostering the industry's growth and encouraging the use of the St. Lawrence as a shipping and trade route.

Elimination of the 25% Tariff on Vessel Importation

On October 1, 2010, in response to a number of requests from the shipping industry, the federal government announced the elimination of the 25% tariff on imports of vessels and ferries under 129 metres in length. This important measure has already made it possible to accelerate the renewal of Canadian fleets across the country by facilitating the replacement of aging craft with more efficient ships equipped with better technology (engines, exhaust treatment systems, hydrodynamics, etc).

Voluntary Measures by the Commercial Shipping and Recreational Boating Industry

Green Marine's voluntary environmental program for the Canadian and US marine industries and the Association Maritime du Québec's Eco-marina program are proof that there is genuine willingness in both sectors to reduce their environmental footprint and work toward sustainable navigation. In addition to rewarding participants' efforts and generating interest from potential participants, these programs foster the commercial shipping and recreational boating industries' outreach to the public.

Summary of the 2012–2017 Action Plan

Despite the environmental and social benefits associated with marine shipping, it obviously cannot constitute a complete supply chain on its own. Intermodality is thus an essential component of marine shipping. The wise use of intermodality with a strong emphasis on marine shipping, that is, one that would optimize the respective benefits of each transportation mode, can only be beneficial and profitable for society. To achieve this ideal, the Navigation Coordination Committee seeks to achieve the following by implementing the new Strategy Action Plan:

- Create conditions that facilitate the use of marine shipping in situations where it offers environmental and social benefits.

ISSUE 9

PROTECTION OF MARINE MAMMALS

Just like on land, preserving the diversity of marine species is an integral part of sustainable development. Many species at risk, including a number of marine mammals, can be found in various parts of the St. Lawrence. A number of acts and regulations enacted in the 1990s and early 2000s are already in place to ensure the preservation and protection of marine mammals. Despite the regulatory measures of the past, continued effort is needed by all industry players to surpass existing regulatory limits.

One of the guiding principles of the Sustainable Navigation Strategy is the protection of ecosystems and water resources and the practice of navigation with a view to ensuring the sustainability of St. Lawrence ecosystems. Today, navigation, whether commercial, recreational or in the form of marine tours, is one of the human activities that affects marine mammals. It is estimated that the noise caused by marine shipping may disrupt the behaviour of marine mammals and may even explain the decline of some species. Collisions between ships and marine mammals have also been a factor since the late 19th century, when ships became able to reach speeds of 13 to 15 knots. Since the 1950s, this phenomenon of collisions with marine mammals has increased with the advent of faster vessels.

Today's commercial vessels are much larger and faster than those in the past, and traffic on the St. Lawrence varies considerably over the course of the year. These factors increase the risk of collisions with marine mammals, despite constant advances in technology for navigational aids. Using the waterway means that attention must be paid to sharing the river among its various users and coexisting with marine mammals.

St. Lawrence Shipoperators

Marine mammal watching can also affect these animals when too many vessels approach or get too close, thus disturbing their normal activities of rest, reproduction and feeding. Attempts by mammals to flee or avoid vessels may result in and cause collisions with ships. A number of different actions have been taken, and more are needed, to limit watching at sea and recreational navigation.

Although the issue of marine mammal protection was not included in the first Sustainable Navigation Strategy Action Plan, the Committee members became interested in it and some have worked to develop projects in recent years. The Working Group on Marine Traffic and Protection of Marine Mammals (G2T3M) was created in April 2011 by Parks Canada and Fisheries and Oceans Canada. Its general mandate is to find approaches to reducing risks to marine mammals in the St. Lawrence estuary while allowing marine shipping activities to proceed without compromising safety. On May 30, 2013, the Working Group on Marine Traffic and Protection of Marine Mammals accepted the Navigation Coordination Committee's offer to join the Committee. At the request of its members, a summary of the initiative follows.

Notable accomplishments of the Navigation Coordination Committee, its members and other partners under the 2004–2011 Action Plan

Creation of the Working Group on Marine Transport and Protection of Marine Mammals in the St. Lawrence Estuary

This working group was set up in April 2011 by common agreement between the École de technologie supérieure, the Group for Research and Education on Marine Mammals, Parks Canada, Fisheries and Oceans Canada and the Université de Montréal. Eager to integrate the needs and constraints of marine traffic players from the outset of this initiative to boost whale population conservation efforts, the Working Group on Marine Traffic and Protection of Marine Mammals takes into account the shipping industry's economic realities, the operational constraints of St. Lawrence pilots and the need to comply with marine safety rules.

The working group is co-chaired by Fisheries and Oceans Canada and Parks Canada and is made up of representatives of the following organizations: Green Marine, St. Lawrence Shipoperators, the Corporation of Lower St. Lawrence Pilots, the Shipping Federation of Canada, the Canadian Coast Guard, the Group for Research and Education on Marine Mammals, the Ministère des Forêts, de la Faune et des Parcs du Québec, Parks Canada, Fisheries and Oceans Canada, the Marine Mammal Observation Network, the St. Lawrence Economic Development Council, Transport Canada, the Université du Québec en Outaouais and the Secrétariat à la stratégie maritime du Québec (ministère des Transports du Québec).

The Working Group's priority in its first phase of work was to find practical solutions to reducing the risk of collisions between shipping vessels and marine mammals in the St. Lawrence estuary and address the issue of the impact on marine mammals of noise from shipping.

Summary of the 2012–2017 Action Plan

In keeping with its desire to protect marine mammals while maintaining navigation activities on the St. Lawrence, the Committee's goals in implementing the new Sustainable Navigation Strategy Action Plan are to:

- Identify measures that will reduce the risk of collisions between commercial vessels and whales in the St. Lawrence estuary through the coordinated efforts of the Working Group on Marine Traffic and Protection of Marine Mammals;
- Maintain communication among the various marine transportation and marine mammal protection players;
- Improve knowledge of the disturbances experienced by whales related to noise in the St. Lawrence as a result of navigation and explore potential solutions.

Conclusion

In the wake of the numerous achievements stemming from co-operation under the Sustainable Navigation Strategy, this new phase embodies a common desire to address existing and emerging problems.

The Navigation Coordination Committee, which gets the credit for successfully devising the strategy, is committed to expanding upon its efforts with this new action plan.

While there are numerous crucial issues, the work to be done is both necessary and exciting. The challenge is as broad as the very ecosystem of the St. Lawrence. The co-operation that has been key to the Committee's cohesion will have to be maintained to ensure that all players and stakeholders adhere to the principles of sustainable navigation and safeguard this precious legacy for future generations.

Complete description of the 2012–2017 Action Plan

The description of the 2012-2017 action plan was updated in 2021: certain elements were highlighted using symbols indicating whether they are completed ✓ or new (N). The elements not accompanied by symbols are ongoing.

CONSENSUS BUILDING

Desired outcomes

- Involvement of community stakeholders depending on the targeted issues.
- Development and implementation of the Sustainable Navigation Strategy.
- Maintaining co-operation, with a periodic review of the mode of operation and the integration of stakeholders depending on the issues.

Actions

- Create or take part in projects, educational, informational, communicational, representation or networking activities to promote the Sustainable Navigation Strategy.
- Develop a reference framework to ensure the smooth operation of the Navigation Coordination Committee. ✓
- Update the frame of reference as needed in order to ensure the continued proper functioning of the Navigation Coordination Committee. (N)
- Ensure administrative and financial monitoring of the various projects.
- Create and coordinate working groups and ensure the performance of studies and other work.
- Propose new projects and funding sources.
- Ensure the dissemination and exchange of information among the navigation stakeholders.
- Design communication and awareness mechanisms to efficiently reach all of the stakeholders with an interest in navigation activities.

INTEGRATED MANAGEMENT OF DREDGING AND SEDIMENTS

Desired outcomes

- Better integration of dredging and sediment management activities in the St. Lawrence through:
  - Improved communications among the various stakeholders in the dredging field;
  - Effective environmental planning and assessment for dredging projects;
  - Appropriate application of federal and provincial criteria, acts and regulations pertaining to dredging and sediment management;
  - The most reliable assessment of the toxic effects of contaminated sediment on the biota;
  - Use of the best management and disposal options for sediment depending on the contamination level, including beneficial uses of mildly contaminated or uncontaminated sediment.

Actions

- Continue the activities of the Integrated Dredging and Sediment Management Committee and its related working groups.
- Continue drafting and finalizing practice guides and integrated dredging and sediment management tools developed by the Integrated Dredging and Sediment Management Committee's working groups.
- Ensure that practice guides and management tools are posted on the Dredging Activities Planning Registry website to make them as widely accessible as possible.
- Keep abreast of new technical and technological approaches that would make it possible to improve the management of dredging projects and assess their relevance for the St. Lawrence.

ADAPTATION OPTIONS

Desired outcome

- Mitigation of the impact of fluctuating water levels in the St. Lawrence on commercial shipping, recreational boating and cruise activities.

Actions

- Improve models for predicting the water level usable for commercial shipping (under keel clearance).
- Ensure follow-up on the biannual data and studies of the International Joint Commission regarding this sector.
- Support the development of a common position for the St. Lawrence with respect to the quality and quantity of fresh water that is essential for use.
- Ensure follow-up on the St. Lawrence Action Plan Climate Change Committee.

PREVENTION OF THE RELATIVE EFFECT OF WAKE

Desired outcomes

- Improved knowledge of the relative effect of the wake of pleasure craft and commercial vessels on erosion.
- Research carried out on the phenomenon of erosion; this is conditional upon obtaining funding.
- Maintenance of the high level of compliance with the voluntary speed reduction measure for commercial vessels.
- Mitigate the impact of high water levels on shorelines. (N)

Actions

- Conduct a study to provide real-time analysis of wake action caused by the passage of vessels in the sector upstream from Lake Saint Pierre.
- Maintain the current voluntary speed reduction measure in the Sorel Islands-Varennes sector.
- Continue monitoring compliance with the voluntary speed reduction measure for commercial vessels.
- Continue analyzing the voluntary speed reduction measure for commercial vessels with respect to its effectiveness in reducing shoreline erosion.
- Document the relative effect of wake of pleasure craft on shoreline erosion.
- Provide recreational boaters with awareness tools.
- Monitor water levels and develop an action plan to address high water levels. (N)
- Foster the exchange of information on practices and initiatives implemented to reduce the relative effect of wake. (N)
- Encourage and support initiatives aimed at reducing the impact of high water levels on shorelines. (N)

MANAGEMENT OF SEWAGE AND CARGO RESIDUES

Desired outcomes

- Coordination of efforts to facilitate compliance with the regulatory requirements for sewage discharge.

Actions

- Raise awareness among authorities of the importance of the presence of sewage collection systems in marinas.
- Inform pleasure boaters of the requirements respecting sewage management.
- Promote collaboration among marine industry stakeholders (ship operators, port authorities, associations, levels of government [federal, provincial, municipal], service providers, etc.) to improve cargo residue collection services in Canadian ports.
- Keep up to date and promote the inventory of sewage collection facilities, both for pleasure boats and cruise/excursion vessels.

INTRODUCTION AND DISSEMINATION OF EXOTIC SPECIES

Desired outcome

- Continued effort to reduce the risk of introducing and disseminating exotic species by all types of vessels, including pleasure craft.

Actions

- Increase awareness among recreational boaters of the risk of introducing and disseminating exotic animal and plant species.
- Monitor compliance with ballast water exchange procedures during inspections of port areas.
- Monitor the effectiveness of new control methods (treatment and screening).
- Monitor the work done on focus area 2 by the St. Lawrence Action Plan Biodiversity Committee with respect to preventing the introduction and controlling the dissemination of invasive exotic species from vessels.

HAZARDOUS PRODUCT SPILLS

Desired outcomes

- Support for the authorities concerned to ensure that riverside communities adopt a marine emergency response plan.
- Monitoring of the reform of Canada's National Oil Spill Preparedness and Response Regime.
- Monitoring of the development and implementation of a preparedness and response plan for ship-caused incidents involving toxic and potentially dangerous substances.
- Establishment of a shared understanding of the risks associated with the shipping of oil and hazardous products within a context of potential supply diversification.

Actions

- Monitor the work of the Tanker Safety Expert Panel.
- Foster exchanges between industry, government and environmental groups regarding the movements of bulk liquid hazardous materials.
- Provide a discussion forum to inform communities and discuss the priorities to be adopted in responding to an occurrence.
- Raise awareness among riverside municipalities of the risk posed by a marine spill and the importance of adopting a marine emergency plan.
- Keep tabs on improvements to winter emergency response methods.
- Support the preventive measures in force and promote them to all stakeholders in the navigation field.

DEVELOPMENT OF MARINE TRANSPORTATION

Desired outcome

- Creation of conditions that facilitate the use of marine shipping in situations where it offers environmental and social benefits.

Actions

- Raise awareness among decision-makers and stakeholders of the environmental benefits of marine transportation.
- Complete and distribute the document on navigation on the St. Lawrence.
- Continue to encourage voluntary measures aimed at reducing the environmental footprint by improving practices in the marine and recreational boating industries.
- Continue offering financial assistance programs to develop marine transportation and improve its environmental performance.
- Continue efforts aimed at developing shortsea shipping.

PROTECTION OF MARINE MAMMALS

Desired outcomes

- Identification of measures that will reduce the risk of collisions between commercial vessels and whales in the St. Lawrence estuary through the coordinated efforts of the Working Group on Marine Traffic and Protection of Marine Mammals.
- Communication maintained among the various marine shipping and marine mammal protection players.
- Improved knowledge of the disturbances experienced by whales as a result of navigation-related noise in the St. Lawrence and exploration of possible solutions.
- Implementation of awareness-raising activities for pleasure boaters. (N)

Actions

- Describe the problem of collisions and encounters between commercial vessels and whales in the St. Lawrence estuary and provide a picture of marine traffic and marine mammals in that area. (✓)
- Review existing solutions to reduce the risk of collisions. (✓)
- Develop scenarios to measure and reduce the risk of collisions and assess those measures on the basis of their impact on whales and marine shipping. (✓)
- Recommend voluntary and provisional measures aimed at reducing the risk of collisions in the St. Lawrence estuary. (✓)
- Obtain a scientific opinion on seasonal distribution and concentration areas of great whales in the St. Lawrence estuary. (N)
- Obtain a scientific opinion on the impact of the diversion of maritime traffic in the St. Lawrence estuary on the beluga. (✓)
- Encourage the continuation of scientific research on the impact of noise on marine mammals. (N)
- On the basis of these, recommend "permanent"[11] collision risk reduction measures for the St. Lawrence estuary.
- Monitor the rate of compliance of merchant marine ships with the voluntary measures proposed. (✓)
- Deal with the problem of shipping-related noise for marine mammals and identify potential solutions to reduce the impact of noise.
- Encourage improved detection of whales and their movements. (N)

11. The principle of adaptive management applies: measures should be reviewed periodically in accordance with their effectiveness and new knowledge.

(✓) Action completed (N) New

2021
UPDATE

Transport Canada Transports Canada

Transports Québec

Sustainable Navigation Strategy for the St. Lawrence

2004–2011 REPORT | 2012–2017 ACTION PLAN

The objective of the Sustainable Navigation Strategy is to help develop the many aspects of navigation activities while treating the St. Lawrence with respect. Sustainable development is the inspiration for the Strategy, which was drafted by the St. Lawrence Action Plan Navigation Coordination Committee. The Strategy provides direction for the management of navigation activities, while taking the economic, environmental and social impacts of these activities into account.

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Montreal Port Authority
Nautisme Québec
Quebec Sailing Federation
Shipping Federation of Canada
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St. Lawrence Shipoperators
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Transport Canada