

### I N T U N E

*Le Fleuve* continues its series on results achieved since 1998 under the various components of Phase III. The issue presents the main results of the State of the St. Lawrence Monitoring Program and those of the Human Health component.

#### **Monitoring of the State of the St. Lawrence**

Four government partners are pooling their expertise and efforts to provide Canadians with information on the state of the St. Lawrence and long-term trends affecting it.

#### **Human health**

Since 1998, a diverse program of monitoring, research and communication activities involving the various uses of the St. Lawrence has been carried out under the Human Health component. In terms of uses, the focus has been on recreational activities and the consumption of drinking water and products from the St. Lawrence.

Knowledge acquisition and public awareness and outreach activities have allowed the initial objective of reducing the public's exposure to drinking water and products presenting a health risk to be achieved.

## Monitoring the state of the St. Lawrence – A decisive first step

*In a recent discussion, the co-chairs of the Ecosystem Monitoring Committee, Hélène Bouchard of the St. Lawrence Centre (an Environment Canada research centre) and Jacques Dupont of the Ministère de l'Environnement du Québec, told Le Fleuve about the committee's main achievements, as well as the outlook for the future.*

Established in 1999, the Ecosystem Monitoring Committee, which consists of specialists from various government departments and agencies, faced the significant challenge of developing a scientific program to assess the state of the St. Lawrence ecosystem and how it has changed over time. To achieve this, committee members designed a monitoring program using environmental indicators to assess the state of the main components of the river, which consist of the water, riverbed, shoreline, biological resources and uses. The results of this huge co-operative venture will soon be made public: an initial portrait, quite encouraging, of the state of the St. Lawrence.

The State of the St. Lawrence Monitoring Program was officially launched at the St. Lawrence

Rendezvous. A series of 16 fact sheets presenting the initial results obtained for the 21 indicators used in the program were made public.

In addition, the target clientele for the program—consisting mainly of government and municipal decision makers, riverside residents, users of the St. Lawrence and environmental groups—discussed ways of improving the program and attracting new partners.

#### **Joining forces**

The members of the Ecosystem Monitoring Committee, which is co-ordinating the establishment and implementation of the State of the St. Lawrence Monitoring Program, consist of government partners,

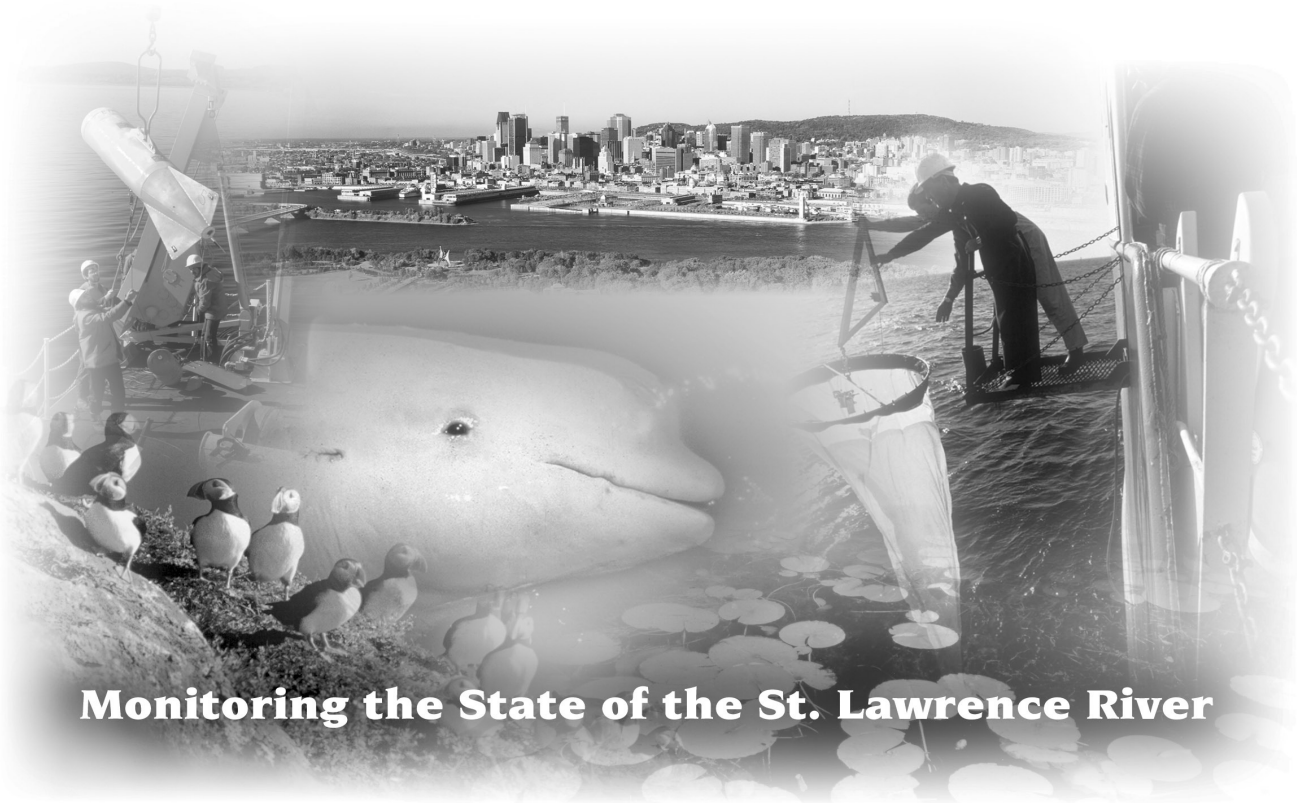
### S U M M A R Y

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## Monitoring the State of the St. Lawrence River

including Environment Canada, the Ministère de l'Environnement du Québec, Fisheries and Oceans Canada and, the Société de la faune et des parcs du Québec. After proposing and developing a program, partners agreed to continue their respective monitoring activities and pool their results.

Stratégies Saint-Laurent is also a member of the committee. It plays a key role, as Hélène Bouchard explains. "This nongovernmental organization allows us to hook up with a number of stakeholders in the environmental community, while also highlighting the concerns of the ZIP committees." The organization, which promotes participation and joint action by riverside communities and

provides ongoing support to the ZIP committees, also plays a very active role in the Community Involvement component.

### A broadened outlook

"In the past, several assessments of the state of the river have been carried out on a limited basis, providing a snapshot of the river at a particular period in time," Bouchard explains.

She adds that this type of assessment did not fully satisfy the continuous need for information by many of the committee's clients, particularly municipal and government decision makers, scientists and environmental groups.

"Therefore, we had to move from one-time-only findings to adopt a long-term perspective. It was a pivotal moment in many ways. We observed that the public tended to have a negative perception of the state of the St. Lawrence. In most cases, this perception did not correspond to, or take account of, scientific reality. Most of the solution lay in the systematic monitoring of the main components of the St. Lawrence and the ongoing dissemination of up-to-date information, to give the public a more realistic view of the situation."

"At the same time, we had to continue to offer rigorous scientific information to decision makers, so that they could make informed decisions to ensure ecosystem integrity and restore lost uses."

## Monitoring activity

Component	Monitoring activity
<b>Water</b>	<p>Hydrometric network (water levels and flow rates) — several partners</p> <p>Toxic substances at the beginning (Wolfe Island) and end (Lévis) of the freshwater section — EC</p> <p>Organic toxic substances at the mouths of the Richelieu and Yamaska rivers— MENV</p> <p>Physical, chemical and bacteriological parameters of water (river)* — MENV</p> <p>Physical and chemical parameters of water (estuary and gulf) — DFO</p> <p>Safety of shellfish harvesting areas in the estuary and gulf* — EC</p> <p>Safety of potential freshwater swimming beaches* — MENV</p>
<b>Sediments</b>	Contamination of sediments in Lake St. Francis by toxic substances — EC
<b>Biological resources</b>	<p>Area of freshwater wetlands — EC</p> <p>Invasive plant species in freshwater wetlands — EC</p> <p>Monitoring freshwater fish communities — FAPAQ</p> <p>Toxic contamination of freshwater fish* — MENV</p> <p>Toxic contamination of marine resources* — DFO</p> <p>Phytoplankton communities in the estuary and gulf — DFO</p> <p>Zooplankton communities in the estuary and gulf — DFO</p> <p>Monitoring of toxic algae in the estuary and gulf — DFO</p> <p>Status of seabird populations — EC</p> <p>Status of Northern Gannet population — EC</p> <p>Status of Great Blue Heron population — EC</p> <p>Status of beluga population — DFO</p> <p>Reintroduction of the striped bass — FAPAQ</p>

\* Linked to public use criteria



## Components under the microscope

The St. Lawrence ecosystem is complex, encompassing a wide range of freshwater, estuarine and saltwater environments, as well as a great diversity of animal and plant species. The program uses as its frame of reference the five basic components of the St. Lawrence ecosystem cited earlier. Initially, the committee decided to limit its activities to the water, riverbed, biological resources and uses components, setting aside the shoreline component.

“To assess the condition of, and changes in, the ecosystem,” Jacques Dupont explains, “we selected 21 indicators, also called environmental monitoring activities, that are part of partners’ permanent data acquisition programs. Although each partner remains responsible for gathering and interpreting data, by analysing the results as a whole, we are able to obtain an overview of the state of the St. Lawrence.”

“The 21 indicators are the foundation of the program, providing it with a solid scientific basis, which, admittedly, required much effort and co-operation on the part of the partners. In future years, other indicators will probably be added, including some involving the shoreline and uses components.”

The State of the St. Lawrence Monitoring Program is based on 21 environmental indicators. They consist in measurements of, or statistics on, water, the riverbed and biological resources of the St. Lawrence; others also involve uses. Indicators are based on current monitoring activities carried out by partners to the agreement: Environment Canada (EC), Ministère de l’Environnement du Québec (MENV), Fisheries and



Northern Gannet  
Photo: Nathalie Brunelle © Le Québec en images, CCDMD

Oceans Canada (DFO) and the Société de la faune et des parcs du Québec (FAPAQ).

### Is the St. Lawrence in better health than it was 10 or 15 years ago?

“With the proviso that we do not yet have a complete vision of the state of the St. Lawrence, but only points of reference, we can say that the ecosystem is in better shape now,” Dupont explains.

In fact, the combined data collected on water, sediments and biological resources show that the St. Lawrence is in better condition than it was in the second half of the 20th century:

- some animal populations, particularly the Northern Gannet and Great Blue Heron, have been restored;
- the consumption of seafood and freshwater fish does not pose a health risk;
- in many areas, the water quality is adequate for recreational uses, even if swimming is still not recommended in most of the river.

On the other hand, a number of problems remain. A slight worsening of bacteriological contamination has been observed. This contamination is mainly due to wastewater releases and storm sewer overflows as well as to low water levels in recent years. This limits recreational uses in the freshwater section and shellfish harvesting in coastal marine waters. In



Great Blue Heron  
Photo: Michel Leblond © Le Québec en images, CCDMD

- toxic contamination has been greatly reduced;



addition, the presence of contaminants in deeper sediment layers is a long-term threat to the St. Lawrence; these sediments could be resuspended as a result of meteorological phenomena and human activities such as dredging.

### **Future challenges**

“Incorporating the information obtained and improving the indicators for the main components of the ecosystem on appropriate space and time scales are major challenges that we still face in the monitoring program,” Bouchard comments.

“Along with maintaining and building on our gains,” Dupont adds, “we would like to recruit new partners, including universities, other government departments and agencies and nonprofit organizations working in environmental protection and conservation. Additional efforts in research, development and the implementation of new monitoring activities will allow us to complete the program.”

“We will also emphasize information sharing with our partners and the dissemination of information online (via the Internet). The St. Lawrence Rendezvous was the first demonstration of this spirit of openness and we hope that a forum for discussions on the state of the St. Lawrence will be held every three years.”

“One thing is certain. Monitoring the state of the St. Lawrence is a shared responsibility that requires a long-term commitment!”

Current partners have taken steps to ensure that the program will continue until at least 2010. Stay tuned for more information...

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## Over the last five years, the St. Lawrence Vision 2000 Action Plan has helped to improve the health of the St. Lawrence

Since 1988, three agreements signed by the federal and Quebec governments to protect, conserve and enhance the St. Lawrence have allowed government partners to take action in various areas affecting the river. Since the third agreement (1998-2003) ends in March 2003, the editors of *Le Fleuve* would like to take this opportunity to publicize some of the results achieved in each component of Phase III of the St. Lawrence Vision 2000 Action Plan (SLV 2000).

## Using Science to Protect Public Health

*Le Fleuve continues its series on the tangible results achieved since 1998 under the various components of SLV 2000 Phase III, as well as prospects for the future. This month, we met with the co-chairs of the Human Health Advisory Committee: Michèle Bélanger of the Ministère de la Santé et des Services sociaux du Québec and Doug Haines of Health Canada. Also participating in the discussion was Claire Laliberté, co-ordinator of the Human Health component and scientific advisor to the Institut national de santé publique du Québec, Quebec's national public health institute.*

Since 1998, a diverse program of monitoring, research and communication activities involving the various uses of the St. Lawrence has been carried out under the Human Health component. In terms of uses, the focus has been on recreational activities and the consumption of drinking water and products from the St. Lawrence.

Knowledge acquisition and public awareness and outreach activities have allowed the initial objective of reducing the public's exposure to drinking water and products presenting a health risk to be achieved.

It is important to note that this success was made possible by co-operation among public health officials, researchers, user associations and ZIP committees (ZIP is short for *Zones d'intervention prioritaire*, or area of prime concern). Each partner, whether involved in research or outreach activities, has contributed in its own way to protecting public health.

### Cyanobacteria<sup>1</sup>: an emerging phenomenon

"To understand the risks of microbiological contamination that the public is exposed to," Doug Haines begins, "we conducted several studies to characterize water quality for recreational activities."

Claire Laliberté explains: "In collaboration with Quebec's public health network, the Ministère de l'Environnement du Québec assessed about thirty potential swimming beaches. We found that, at a dozen sites, the water was safe enough for swimming 75% of the time. The study allowed several previously unused sites to be developed as swimming beaches."

"We also conducted an exploratory study of personal watercraft users and other pleasure boaters to assess the microbiological risks they are exposed to. The report, which we are in the process of drafting, will be made public soon."

An in-depth study was also carried out on the presence of cyanobacteria in the L'Assomption, Châteauguay and Yamaska river watersheds.

"The consumption of water with a high level of cyanobacteria poses a health risk, since these blue-green algae can cause toxic shock to the liver," Michèle Bélanger explains. "Global warming is causing increased cyanobacteria counts in watercourses that do not have a rapid flow rate."

"At several swimming beaches in the Yamaska basin, the study revealed cyanobacteria concentrations that pose a health risk to swimmers and water-skiers."



Cyanobacteria

“Since it is very difficult to combat the conditions favouring the proliferation of cyanobacteria”, Haines remarks, “these health problems may very likely become recurrent and even increase in the future.”

Therefore, disseminating information about the problem is crucial, and indeed a priority. The Ministère des Services sociaux du Québec will publish a pamphlet based on the study’s conclusions, to inform the public about the situation. Even though the pamphlet is not being produced under SLV 2000, Bélanger maintains that it is an example of the positive impacts that the plan has had outside its official sphere of action.

### **Good quality drinking water**

“The St. Lawrence River provides drinking water for 40% of Quebec’s population. In Phase III, we have been focusing on the effects of drinking water contamination on health rather than on characterizing quality,” Haines says.

In a few months, the results of two epidemiological studies carried out in eastern Quebec and the Montérégie region will be made public. The goal of the first study was to determine if the water of the St. Lawrence and its tributaries is a significant source of giardiasis<sup>2</sup> in eastern Quebec. This illness, caused by a parasite, is a reportable disease in Canada.

The second study aimed to assess the potential association between the consumption of water from the Yamaska River and reported cases of gastrointestinal illnesses.



Photo: Françoise Lapointe, Environment Canada



Gill net fishing  
Photo: Sylvain Desloges, FAPAQ

“Preliminary results show that pollution levels are higher in agricultural areas like the Montérégie region, where the Yamaska River is polluted mainly by manure from livestock. We do not know yet whether this region is more affected than others,” states Bélanger.

The results of two exploratory studies on the safety of drinking water are quite encouraging:

- concentrations of alkylphenol ethoxylate byproducts (used in the pulp and paper and textile industries) in drinking water do not seem to pose a health risk;
- no proof has been found that chlorine dioxide (a disinfectant used in treating drinking water) or two of its byproducts have harmful effects on infants (thyroid function and certain blood parameters).

### **A guide for emergencies**

Environmental disasters can happen anywhere, including Quebec. This is why Quebec’s Institut national de santé publique and the Canadian Coast Guard have published an emergency response guide for oil and chemical spills in the freshwater section of the St. Lawrence.

“This helps regional public health departments to be better prepared should drinking water be contaminated,” Bélanger explains. The guide, which mobilized a number of players in the environmental field, can also be used in emergency situations when the drinking water supply is threatened.

### **Consumption of products from the St. Lawrence: low or nonexistent health risks**

Although, in Phase II, the emphasis was on fish consumption, in Phase III, efforts focused on waterfowl and shellfish, particularly mussels.

Among the numerous studies, surveys and other research projects carried out in the last five years, notable ones include studies of waterfowl hunters, ice fishermen on the Saguenay River and the urban poor.

In 2000, a survey of waterfowl consumption was carried out among roughly 500 waterfowl hunters. The purpose was to determine if the consumption of geese and dabbling ducks harvested from the St. Lawrence poses a health risk.

“The results of a risk analysis based on the survey data prove otherwise,” explains Bélanger. “The quantities of mercury consumed were not great enough to pose a threat. Furthermore, the minimal amounts of other contaminants (Mirex, dieldrine, chlordanes, dioxins and furans) found in the flesh of waterfowl pose only very low health risks.”

Similar results were obtained from the survey of ice fishermen on the Saguenay River.

As Bélanger explains, “In the last few years, we observed a decrease in contaminant levels in the flesh of fish from the St. Lawrence and the Saguenay fjord. Mercury and PCB concentrations are within acceptable levels and exposure scenarios for dioxins and furans did not significantly exceed doses deemed to be safe to human health.”





Shellfish harvester  
Photo: Jean Guénette



Blind for duck hunting  
Photo: Îles-de-la-Madeleine ZIP Committee

To respond to anglers' different concerns and questions, a document on the nutritional qualities of sport fish from Lake St. Pierre was published under the Human Health component of the SLV 2000 Action Plan.

Haines explains: "We are about to publish a food guide to the St. Lawrence, the Guide alimentaire du Saint-Laurent, which deals with the nutritional aspect of fish caught and sold commercially. The 35-page booklet will be posted on the SLV 2000 website in the next few months."

In terms of shellfish consumption, a monitoring program established in eastern Quebec in co-operation with the clinical staff of 66 health-care institutions confirmed that microbiological contamination of shellfish, particularly mussels is a problem (see "Shellfish-Related Illnesses Closely Monitored," *Le Fleuve* newsletter, vol. 13, no. 4 – November 2002, p. 1-3).

Lastly, according to a study conducted on Quebec's North Shore, since 1993, organochlorines<sup>3</sup> in newborns have decreased by 10% every year, Laliberté reports. "This drop can be explained by the fact that mothers have decreased their consumption of contaminated seabird eggs. The information campaign carried out by the North Shore public health department targeting these women seems to have worked."

### **A foray into social research**

Human Health component partners are also interested in social research. "In co-operation with health

network professionals, as part of an exploratory study, we analysed the community health effects of fishing in the St. Lawrence among a disadvantaged population in the Hochelaga-Maisonneuve district. This innovative family-oriented activity was organized by a local community group,” Laliberté explains.

“Among other things, we wanted to see if fishing in the St. Lawrence could help provide to some degree a secure source of food for disadvantaged families. The data analysis showed that this was not the case. However, the activity itself was found to have beneficial effects on the psychological and physical well-being of participants. The study also confirmed that fish consumption posed no health risks to the people surveyed.”

### **Health and community involvement**

In terms of community participation, officials of the Human Health component work closely with local health-care institutions, ZIP committees and user, hunter and angler organizations.

“We encouraged ZIP committees to submit proposals for the dissemination of information on health risks and uses of the St. Lawrence,” Bélanger explains. “To ensure that the messages disseminated reflect current scientific knowledge, ZIP committees received scientific support from a public health professional.”

The many achievements of Human Health component partners include a map of swimming beaches produced by the Corporation de l’île Saint-Quentin in collaboration with the public health department (Direction de la santé publique).



Fish examination in the laboratory  
Photo: Yves Mailhot, FAPAQ

Lastly, public awareness campaigns were organized on shellfish consumption and health risks by the Chaleur Bay, Magdalen Islands and North Shore of the St. Lawrence Estuary ZIP committees.

### **An upcoming survey and scientific assessment**

“In December 2001, we undertook a survey of 5,000 riverside residents,” Laliberté explains. “This survey was a follow-up, or to be more accurate, a complement, to a 1995 survey which allowed us to better understand the relationship that 14,000 riverside residents had with the St. Lawrence and to determine their need for information, among other things.”

“We will now be able to find out whether riverside residents’ perceptions of the river have changed

and if they have modified their activities. The results, to be known soon, will allow us to modify our own efforts accordingly.”

“We are also putting the final touches on a scientific assessment entitled Health and the St. Lawrence: A Status Report,” Haines adds. “This report will allow us to take stock of the knowledge acquired under the Human Health component of Phase III of the SLV 2000 Action Plan. It will also be available soon.”

### **Increased knowledge and a spirit of openness**

As we have seen, a great deal of knowledge has been acquired in the last five years on the link between water, the products of the St. Lawrence and health. These years were also characterized by a greater openness to the needs of the public.

As Haines comments, “The more we progress, the more people-oriented we become. The acquisition of scientific knowledge remains essential, however. This ensures accurate information that allows us to formulate policies to protect public health.”

What will the major challenges of the next few years be? “We are currently working on approaches more focussed on public awareness, outreach and promotion activities,” Bélanger concludes.

1 Cyanobacteria are bleu-green algae that float on the surface of the water. Large quantities of these algae are called algal blooms. Cyanobacteria consist of potentially toxic cells; the toxins in cyanobacteria are divided into two types: hepatoxins and

neurotoxins. Source: *It's Your Health*, Health Canada.

<sup>2</sup> Gastrointestinal illness caused by a microscopic parasite (Giardia) that can be found in water.

<sup>3</sup> Organochlorines are pesticides containing at least one carbon-chlorine bond per molecule. This class of compounds includes DDT, PCBs, dioxins, furans, toxaphene and Mirex.

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# News *in* BRIEF

## Community Interactions Program

We are pleased to inform you that the deadline for submitting project proposals under Phase III of the SLV 2000 Community Interaction program has been extended. This decision was made jointly by Environment Canada, the Ministère de l'Environnement du Québec and the Société de la faune et des parcs du Québec.

**The new deadline for submitting project proposals is April 1, 2003.**

If you wish to have more information about the program or to obtain documents to submit a project, please contact a Project Officer at the following address:

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# LE FLEUVE

## NEWSLETTER ST. LAWRENCE VISION 2000

*Le Fleuve* is jointly published by  
St. Lawrence Vision 2000 partners.

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The *Le Fleuve* Newsletter is published  
on the SLV 2000 Internet Site at:  
[www.slv2000.qc.ca](http://www.slv2000.qc.ca)

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**ISSN 0847-5334**

### Legal deposit:

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Volume 13, issue 6

*Le Fleuve* est aussi disponible en  
français.