LE FLEUVE

NEWSLETTER
ST. LAWRENCE VISION 2000

VOLUME 10 — ISSUE 7 — DECEMBER 1999

The "Blue Economy" as a Key to Sustainable Development of the St. Lawrence

Photo : Nathalie Letendre

On October 12 and 13 in Trois-Rivières, the Amis de la vallée du Saint-Laurent (AVSL) *held a forum on the economic cost-effectiveness of the St. Lawrence and the ecological approach under the theme "The Blue Economy and the Development of the St. Lawrence". With financial support from the St. Lawrence Vision 2000 Action Plan (SLV 2000), the event brought together close to 140 participants, including many of those who use, promote and manage the St. Lawrence.*

This article looks at the forum's conclusions on issues relating to the sustainable development of the St. Lawrence.

Jean-Pierre Gauthier, who is federal co-chair of St. Lawrence Vision 2000, was asked to make the opening address. He noted that the St. Lawrence has always been and still is central to Quebec's economic development. This development has, in the past, been accompanied by an extensive "ecological mortgage". Happily, the river has an impressive recovery capacity and recent analyses of water quality criteria and sediments indicate that the river's health is improving.

IN TUNE

The "Blue Economy" as a Key to Sustainable Development of the St. Lawrence

Conclusion of discussions on an environmental approach to the economic cost-effectiveness of the St. Lawrence by participants at a forum hosted by *Les Amis de la vallée du Saint-Laurent* in October.

An increasing knowledge of biodiversity

Guide d'identification du phytoplancton marin de l'estuaire et du golfe du Saint-Laurent: document describing 499 species of marine phytoplankton of the St. Lawrence, supplemented by 1,200 photographs.

Catalogue des invertébrés marins de l'estuaire et du golfe du Saint-Laurent: catalogue of 2,214 known species and varieties of metazoan invertebrates.

ZIP Chronicle

The Jacques Cartier ZIP committee, in a heavily urbanized and densely populated part of Montreal, deals with complex problems such as contaminated sediments n the Port of Montreal and monitoring wastewater quality in the Montreal Urban Community.

SUMMARY

Canada

Saint-Laurent Vision 2000

Québec

The St. Lawrence Action Plan is one of the many programs that have promoted this recovery. Eleven years after its launch, achievements under the plan show that the river's environmental and economic health are not irreconcilable. On the contrary, spending under the program has proven to be highly cost effective in terms of economic spinoffs; many social benefits have also accrued from the investment, including job creation, the development of recognized expertise and community involvement.

Photo : Nathalie Letendre

Harnessing our creativity for the St. Lawrence

Two round tables prompted participants to come up with ideas at the forum. "We could see that there are a number of young enterprises in riverside communities poised to fuel the new economy of the St. Lawrence with their creativity", says AVSL president André Stainier. Among the original initiatives that show the growing interest in the natural resources and attractions of the St. Lawrence, a seaweed therapy firm has created specialized employment by opening its doors in Les Mechins. Élyse Lauzon, of Société Duvetnor, exemplifies the concern these new entrepreneurs have for sustainable exploitation of the river's resources. Together with a number of promoters along the Lower St. Lawrence, this organization is now developing a label that can be obtained by ecotourism enterprises meeting the quality objectives established by the proponents.

A second round table focussed on new approaches to using the river as a body of water and means of communication with a view to reducing ecosystem impacts and protecting the integrity of the natural resource. "The experience of the paper mills, for example, shows how, by adopting and even surpassing environmental standards, firms can acquire an expertise and visibility that places them in an enviable position in the international market place," says Stainier.

Finally, Riccardo Petrella, president and founder of the Group of Lisbon and a proponent of the world water contract, explained the basics of the awareness raising and mobilization campaign on water as a collective asset and heritage belonging to all of mankind. Recalling water's value as a part of our physical, social and cultural environment, Petrella stressed that water should be managed democratically by and for all of society, with consideration for essential human needs.

Survey reveals how far we have to go

The forum also provided an opportunity to announce the results of an AVSL-sponsored survey conducted by the firm Léger and Léger to ascertain the Quebec public's interest in and perceptions of the economic viability of the St. Lawrence River and how it relates to the river environment. Members of the general public and forum participants were surveyed.

"The people of Quebec are still unaware of some of the most harmful activities such as agricultural pollution and wastewater discharges. Nor do they realize the ecological and economic benefits of shipping", says Stainier. The survey reveals that:

• shipping (37%), motorized water sports (22%) and industrial activities (22%) were perceived as being the most harmful economic activities in terms of the quality of the St. Lawrence environment, while agricultural activities (3%) and wastewater discharge (11%) were reviewed as relatively or completely harmless;

• only 15% of the population think that ships are the most economical way to transport merchandise, far behind trains (37%) and even trucks (39%).

However,

• the main economic activities linked to the St. Lawrence were, according to the respondents, commercial shipping (42%) and tourist excursions (21%);

• cruises (28%), environmental observation (18%) and marine transportation (17%) were preferred sources of investment.

Interestingly, 51% of the Quebec population said they had gone to the river at least once in the past 12 months.

The growing need for public education

According to Stainier, the survey results clearly show that efforts must be stepped up to improve the image Quebecers have of the river. Despite the fact that the St. Lawrence has been the focus of a number of restoration efforts in the previous decades, there is a significant gap between public perceptions and the current state of the river. The river's ecological recovery has been a source of innovative economic development and job creation, which have benefited many communities along its shores.

"That is why the Amis de la vallée du Saint-Laurent plan to continue their efforts to promote a positive image of the river and encourage the public to identify with it, rediscover the St. Lawrence and appreciate the new economy it is driving," concluded Stainier. "We will also continue to intervene with public and private investors, who should be invited to increase support for the blue economy." Repeating the words of Michael Schmouth, who attended the forum as an observer and reporter, Stainier closed discussions at the forum as follows, "the main principle around which our living together along the river should be organized is the adherence to a single common goal, which is the sustainable viability of the St. Lawrence as our shared capital."

Information:

André Stainier
Les Amis de la vallée du Saint-Laurent
Telephone: (418) 834-5150
Fax: (418) 834-7244
e-mail: avsl@qc.aira.com
Source:

LES AMIS DE LA VALLÉE DU SAINT-LAURENT, 1999. *Sondage LÉGER & LÉGER sur la rentabilité économique du Saint-Laurent telle que perçue par la population du Québec*, file, 36 pp.

An increasing knowledge of the biodiversity of the Gulf of St. Lawrence and maritime estuary…

but with more surprises in store!

The National Research Council of Canada recently announced the publication of two monographs: Guide d'identification du phytoplancton marin de l'estuaire et du golfe du Saint-Laurent (Guide to Identifying Marine Phytoplancton of the Estuary and Gulf of St. Lawrence) and Catalogue des invertébrés marins de l'estuaire et du golfe du Saint-Laurent (Catalogue of Marine Invertebrates of the Estuary and Gulf of St. Lawrence). These reference works were produced under the biodiversity component of the St. Lawrence Vision 2000 Action Plan (SLV 2000). These works make a significant contribution to the identification and understanding of the characteristic organisms of the cold, stratified saltwater of the estuary and Gulf, and are vital tools for evaluating biodiversity in the St. Lawrence.

The St. Lawrence can be divided into several regions, defined by a combination of factors such as depth, salinity, type of sediments, winter water temperature, and underwater relief. These factors impose a number of constraints on the plants and animals that inhabit the St. Lawrence.

Three groups of marine organisms, each of which has a highly distinctive way of life, help to make up the marine ecosystems of the St. Lawrence. Plankton consist of tiny plants and animals suspended in the water column that drift with the whim of the currents. Nekton are actively swimming animals that move independently of the currents, while benthos consist of fixed or mobile plants and animals that live on or near the bottom or in the bottom sediments.

Marine phytoplankton: microscopic organisms with a significance way beyond their size

Phytoplankton, or plant plankton, play a key role in marine ecosystems. These microscopic algae can only be seen with the naked eye when they multiply to the point where they form floating mats, sometimes known as red tides. Phytoplankton use the energy of the sun to produce living matter from nutrients, in the process called photosynthesis. These algae form an essential first link in the food chain since many animals graze or filter feed on them.

The objective of the *Guide d'identification du phytoplancton marin de l'estuaire et du golfe du Saint-Laurent* is to provide, in a single document, descriptions and illustrations of the phytoplankton species present in the saltwater portions of the St. Lawrence. Previously, those trying to identify species of phytoplankton from the region had to rely almost entirely on a taxonomic work on Chaleur Bay species and monographs from abroad, making identification more difficult and time-consuming.

Increasingly refined methods

Lyse Bérard-Therriault, researcher at the Maurice Lamontagne Institute, directed the laboratory effort required to produce the guide. Her team used samples collected from a number of oceanographic cruises between 1994 and 1998, as well as previously collected and analysed specimens. The painstaking work of identification, using optical and electron microscopes, began in September 1994. "Often, long hours of work were required to identify an organism. Sometimes, refinements in microscopic techniques even allowed us to find previously unknown characteristics of an organism, which meant that the existing taxonomy had to be revised," explains Bérard-Therriault. This occurred with the alga Alexandrium excavatum, previously known as Protogonyaulax tamarensis. When filtered by mussels, it causes paralytic shellfish poisoning in humans, and shellfish harvesting is banned when the algae are detected.

Programs to monitor toxic algae are one of the scientific activities that will benefit from the publishing of the guide, since they require an absolutely accurate identification of phytoplancton species. Another area to benefit is research on organisms that feed on phytoplankton.

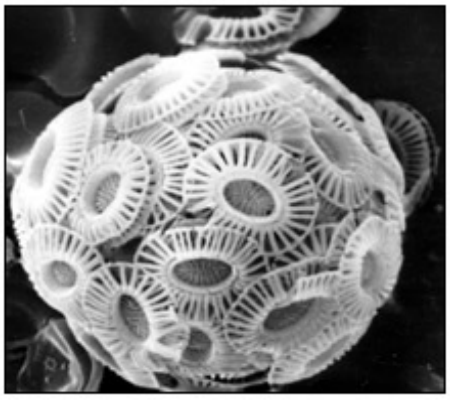
An impressive but not yet complete family album

The guide deals with 499 species of marine phytoplancton, which were identified, measured and

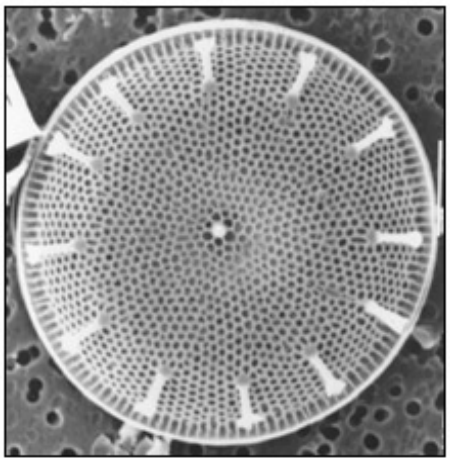
photographed. It includes 1,200 photographs taken with optical and electron microscope, as well as taxonomic references and brief descriptions of the species identified and their distribution in the St. Lawrence. The two largest phytoplankton groups, diatoms and dinoflagellates, are particularly well illustrated. In addition, there is a chapter on the identification of a number of protozoan species, tiny organisms possessing both the characteristics of plants and animals, which were also found in the samples.

According to Bérard-Therriault, however, this survey of the area's marine phytoplankton is far from exhaustive. "In Europe, where river phytoplankton have been studied for a hundred years or more, researchers are still finding new species. The waters of the St. Lawrence still harbour many unknown organisms, particularly small species that are more difficult to identify because they are so fragile." The variability observed in phytoplankton throughout the samples is another reason to continue the work. "Although there are little data to support this thesis, climate change may come into play here, resulting in the appearance of new species, the disappearance of others, changes in species dominance, or the expansion of a species' range," Bérard-Therriault explains. She goes on to say that several decades of observations are needed to ascertain the impact of climate change. Lastly, it is important to remember that, with the dumping of ballast water from ships and the possible introduction of new species to the St. Lawrence, the marine environment is constantly evolving.

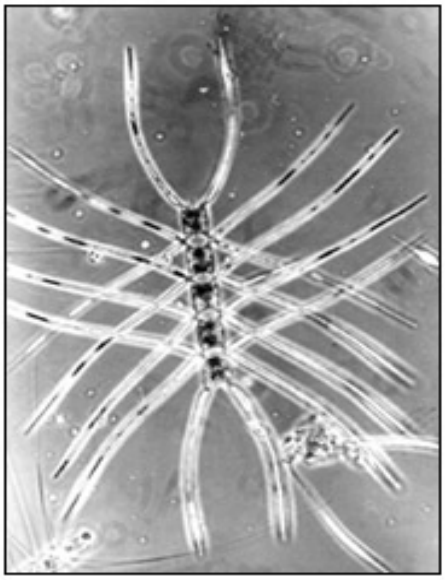
Scanning electron microscope photographs — Courtesy of Lyse Bérard-Therriault



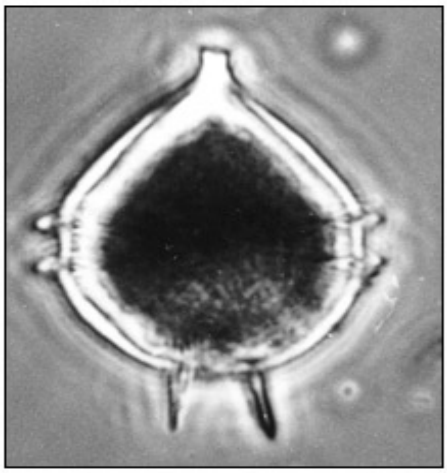
Microflagellate, coccolithophorid — *Emiliana huxleyi* (magnified 7,500 times)



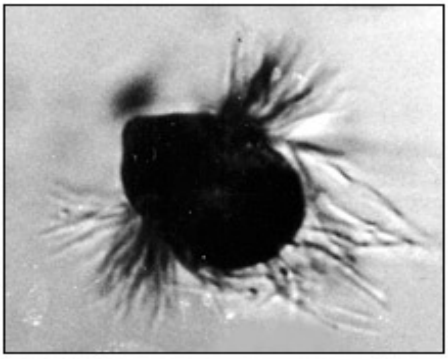
Centric diatom — *Thalassiosira nordenskioeldii* (magnified 3,500 times)



Centric diatom — *Chaetoceros atlanticus* (magnified 210 times)



Centric diatom — *Chaetoceros atlanticus* (magnified 210 times)



Protozoan — Ciliate — *Mesodinium rubrum* (magnified 800 times)

Marine invertebrates are responsible for most of the diversity of animals in our oceans

The marine invertebrates also consist of an extremely wide range of species, with forms as unusual as they are diverse. Marine invertebrates are represented by twenty or so phyla, including sponges, molluscs (gastropods and bivalves), segmented worms (polychaetes) and crustaceans, to name but a few.

Another fundamental tool in our knowledge of biodiversity in the St. Lawrence, the Catalogue des invertébrés marins de l'estuaire et du golfe du Saint-Laurent is a nearly exhaustive survey of 2,214 known species, subspecies and varieties of metazoan invertebrates in the estuary and Gulf of St. Lawrence and Saguenay Fjord. A range of benthic, planktonic, nectonic and parasitic organisms are included, although benthic organisms make up the most diverse group, representing over 80% of the invertebrates.

This work is based on two types of sources, bibliographic material (monographs, articles, theses, dissertations and private and government reports dating from 1841 to today) and research collections. "Our catalogue brings together data that were previously widely dispersed, as well as disseminating previously unpublished information," explains Luci Bossé of the Maurice Lamontagne Institute, who initiated and directed the study and is one of the three authors.

For each species, the authors provide information on its geographic and bathymetric distribution and ecological characteristics. Taxonomic references are also provided, consisting mainly of identification guides that allow researchers to accurately assign scientific names to the Gulf's animals.

A Herculean effort that is a major contribution to taxonomy

Many years of painstaking work went into publishing this catalogue, not only to pull together citations from across the literature (published and unpublished) and identify specimens in collections, but to update the nomenclature used in the old documents.

"Furthermore, we took advantage of the expertise of over sixty taxonomists from around the world to validate the information in the catalogue. The open-ended, evolving nature of the text is shown by the comments of these specialists, who on occasion questioned certain statements cited widely in the literature," Bossé continues.

The document's broad scope, both in terms of its geographic and taxonomic coverage and its ecological content, makes it unprecedented in Quebec and even in eastern Canada. It is an essential tool for taxonomists, pointing them to the species found in our waters and then suggesting pertinent taxonomic references. At a time when species are disappearing at an alarming rate on a planetary scale, this catalogue is a major contribution to our knowledge of the biodiversity of the estuary and Gulf of St. Lawrence.

Collections threatened

Pierre Brunel, professor at the University of Montreal's Biological Sciences Department and co-author of Catalogue des invertébrés marins de l'estuaire et du golfe du Saint-Laurent, believes that it is essential to ensure the future of the research collections used to prepare the catalogue. "Since the majority of marine invertebrate species are extremely small, rare species greatly outnumber abundant species and many species live at great depths or very far offshore, it is very difficult and costly to procure as many specimens to study as one would like. This is why it is crucial to conserve the specimens that have been collected, most often inadvertently," Brunel explains. Conserving specimens entails putting them in a liquid like formaldehyde or alcohol, labelling them carefully, classifying and storing them in a research collection and making them available to specialists.

"Traditionally, these collections have been kept in natural history museums. Quebec is the only province, however, not to have a government-owned museum with a research mandate in natural science collections. The three main marine collections currently available—the Canadian Museum of Nature and Maurice Lamontagne Institute collections and my personal collection—must be maintained so that any person can validate or correct the data in the Catalogue des invertébrés marins de l'estuaire et du golfe du Saint-Laurent," Brunel concludes. Collections are also essential in that they bear witness to the past, allowing us to ascertain changes occurring in ecosystems.

For more information:

Lyse Bérard-Therriault
Maurice Lamontagne Institute
Telephone: (418) 772-9385 or (418) 775-0819
Fax: (418) 775-0542

Luci Bossé
Maurice Lamontagne Institute
Telephone: (418) 775-0669
Fax: (418) 775-0542
E-mail: bossel@dfo-mpo.gc.ca

Pierre Brunel
Université de Montréal, Département de sciences biologiques
Telephone: (514) 737-5124
Fax: (514) 343-2293

Sources:

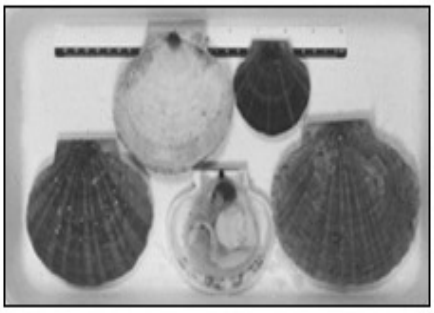
BÉRARD-THERRIAULT, L., M. POULIN and L. BOSSÉ 1999. Guide d'identification du phytoplancton marin de l'estuaire et du golfe du Saint-Laurent incluant certains protozoaires. Special supplement, Canadian Journal of Fisheries and Aquatic Sciences 128, 387 p.

To consult the table of contents of this document:
http://www.cnrc.ca/cisti/journals/42260/ftc42260.html

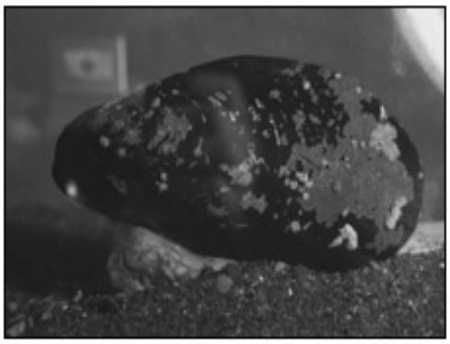
BRUNEL, P., L. BOSSÉ and G. LAMARCHE 1998. Catalogue des invertébrés marins de l'estuaire et du golfe du Saint-Laurent, Special supplement, Canadian Journal of Fisheries and Aquatic Sciences 126, 405 p.

To consult the introduction to this document:
http://www.nrc.ca/cisti/journals/41393/invert_f.html

Marine invertebrates of the Gulf of St. Lawrence



Placopecten magellanicus (deep-sea scallop)
Photo : Pierre Brunel



Modiolus modiolus (horse mussel) in an aquarium
Photo : Pierre Brunel

Pasiphaea multidentata (larval caridean shrimp)
Photo : Gabriel Lamarche

Anonyx makarovi (Voracious necrophagous amphipod)
Photo : Bernard Ste-Marie

Rhachotropis oculata (Swimming planktivorous amphipod)
Photo : Bernard Ste-Marie

Group of ten species of gammardian amphipods (crustaceans)
Photo: Bernard Ste-Marie and Gabriel Lamarche

Chronicle
ZIP Committees in the Heat of the Action

The Jacques Cartier ZIP Committee

Team Work in an Urban Environment

The Jacques Cartier ZIP Committee was incorporated in 1996 as the Eastern Montreal ZIP Committee, changing its corporate name last June to reflect its territory more accurately. This article reports on the activities of the Committee, which brings to the same table a number of stakeholders concerned with such complex issues as sediment contamination in the Montreal harbour and monitoring the quality of Montreal Urban Community wastewater.

Photo : CUM

The Jacques Cartier ZIP Committee's territory takes in the highly urbanized, densely populated sectors of Montreal and Montreal East on the north shore and St. Lambert, Longueuil and Boucherville on the south shore. In addition to the Island of Montreal, the territory also includes St. Helen's, Notre Dame, Verte and Batture islands, the Boucherville Islands and the Tailhandier flats. Residents have been cut off from the river by expressways and, on the Montreal side, where 25 kilometres of riverbank are devoted exclusively to commercial shipping, by port infrastructure. They have been stepping up calls for access to the river.

Stressing the great number of organizational structures in this metropolitan area that are involved in protecting, managing and enhancing the river, Claire Vanier, the ZIP Committee's co-ordinator, points to the potential for joint action on projects included in the ERAP for the Jacques Cartier ZIP. It takes sustained teamwork by all of the government and non-governmental stakeholders, some of whom may have apparently divergent interests, to follow through on environmental projects.

Among the thirteen data sheets in the Jacques Cartier Zip Committee ERAP, two projects now in progress illustrate the peculiarities that stem from the urban nature of the territory and the benefits of the teamwork approach being taken to promote the harmonious co-existence of different uses of the St. Lawrence.

Contaminated sediments in the Montreal harbour

An engine of industrial and urban development, the Montreal harbour was developed in an era when there were no environmental standards, leaving the water quality and the river bottom of the St. Lawrence significantly degraded. "Clearly, the role of the ZIP Committee is not to evaluate the level of sediment contamination or to restore these sites," explains Vanier, "but we can be part of the solution by bringing industrial partners, government authorities and community organizations together, encouraging them to work with one another, and informing the public."

It was for this purpose that the Jacques Cartier ZIP Committee set up an advisory group in the spring of 1999 consisting of several organizations concerned about the remediation of sector 103 of the harbour. The sediments in this sector were contaminated chiefly by past direct dumping of industrial wastewater into the river and polluted runoff from industrial land. Levels of hydrocarbons and heavy metals in the sector are high.

So far, the advisory group, which includes the Montreal Harbour Authority, Environment Canada, Noranda CCR, Imperial Oil, Shell Canada, the Quebec Department of the Environment, the Quebec

Photo : Administration portuaire de Montréal

Department of Health and Social Services and a number of community organizations, has defined its objectives and stated how it will go about achieving them.

The strength of this group is that it establishes a dialogue and a means of sharing information and expertise among stakeholders who have had little to do with one another in the past. Training sessions will familiarize group members with aspects of the contaminated sediments issue such as the impact study and public consultation process, remediation techniques, and legal questions. These sessions are open to the general public and will help prepare citizens who wish to participate in future consultations.

Some of the partners who have been working on this issue for a long time feel that the advisory group's creation has helped move things along. Companies whose past activities played a role in polluting the sector have now begun to show an interest, while before they did not feel they had any stake in helping to solve the problem.

Monitoring wastewater quality

To date, $1.4 billion has been spent on wastewater interceptor and treatment facilities in the Montreal Urban Community (MUC). Nevertheless, despite a net improve in the quality of surface water in the river, the community continues to have concerns about problems such as rainfall overflow and the lack of any regional regulations on toxic industrial effluent discharges to municipal sewers.

In 1997, the Jacques Cartier ZIP Committee set up a standing committee to monitor wastewater in the MUC territory. It now co-ordinates the committee together with the Ville Marie ZIP Committee. The standing committee includes representatives of the MUC, Environment Canada, Environment Quebec, the Quebec Department responsible for Municipal Affairs and Montreal, citizens' groups, environmental organizations and industries.

Pointing to the many levels of government involved in wastewater management and the size of investment required, Vanier stresses the potential of the consultative approach for solving the problem.

Photo : CUM

“In wastewater quality monitoring, for example, management by sector had clearly gone as far as it could, and the consultative process made it possible to go further. The decompartmentalization brought about by consultation makes it possible to combine stakeholders’ expertise and energy. We have noticed that a ‘culture of consultation’ has sprung up among the partners as they see their work getting results.”

With respect to access to the river and its islands, the Jacques Cartier ZIP Committee also strives to bring together the authorities responsible and stakeholders who have an interest in enhancement or protection. For example, an alliance of interests is required to remedy the lack of green space along the river. The high ecological and tourism potential of the islands in the St. Lawrence is of interest to a number of organizations and promoters, and as a result, comprehensive management must be envisaged both to allow public access and to safeguard the environment.

Information:

Claire Vanier, Co-ordinator
Jacques Cartier ZIP Committee
Telephone: (514) 527-9262
Fax: (514) 527-0836
e-mail: zip_jc@cam.org

News *in* BRiEF

SEASON'S GREETINGS TO ALL OUR READERS

With the Christmas and New Year's holidays soon upon us, the partners of the St. Lawrence Vision 2000 Action Plan would like to take this opportunity to send season's greetings to all Le Fleuve readers. We hope that this newsletter will continue to enlighten you on issues involving the Action Plan and keep you well informed of the results of its implementation.
The editors would like to remind you that the next issue will appear in February 2000.

LE FLEUVE

NEWSLETTER
ST. LAWRENCE VISION 2000

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

Co-ordination:
Raymonde Goupil, Clément Dugas and Suzanne Bourget

Text:
Gaétane Tardif, Environmental Consultant

Revision:
Josée Lecomte

Realization:
Françoise Lapointe, editor, SLV 2000

Translation from French to English:
PWGSC—Translation Bureau

The *Le Fleuve* Newsletter is published on the SLV 2000 Internet Site at: www.slv200.qc.ec.gc.ca/slv2000/english/indexeng.htm

ISSN 0847-5334

Legal deposit:
National Library of Canada, Bibliothèque nationale du Québec
Volume 10, issue 7.

Le Fleuve est aussi disponible en français.