LE FLEUVE

NEWSLETTER
ST. LAWRENCE VISION 2000
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IN TUNE

A MORE SUBSTANTIAL NEWSLETTER

With a view to offering you a more complete newsletter which reports on the many projects underway at SLV 2000, *Le Fleuve* will from now be 12 pages. This 50% increase in the number of pages should allow *Le Fleuve* to treat more topics and accurately reflect the dynamism of the field and the involvement of administrators and researchers in reaching objectives.

We would like to take the opportunity at this time to appeal to readers who would like to air their views on the various topics relating to the St. Lawrence. Beginning in the next issue, a *Letters to the Editor* column will be available to all those who are interested in the health of the St. Lawrence River.

On the menu this month, *Le Fleuve* presents a Geographic Information System (GIS), a portrayal of the river's biodiversity, a health check-up on several ZIPs, "green" farming clubs, the water quality of tributary rivers, the strategy of virtual elimination of persistent and bioaccumulative toxic substances, as well as workshops on the conservation of habitats which were held last November in the Québec City region. In short, a great "Info-diversity"!

We wish you happy reading, and extend our warmest wishes for the New Year!

The Communications Harmonization Committee

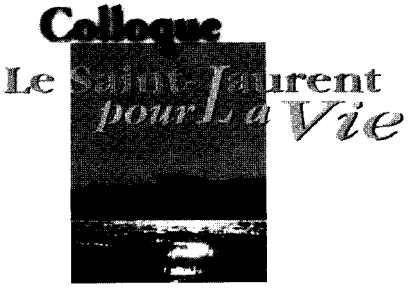
The St. Lawrence–for Life

At the end of last October, close to 500 people from various walks of life took part in the symposium *The St. Lawrence—for Life* which was organized by the Association des biologistes du Québec (ABQ) and St. Lawrence Vision 2000 (SLV 2000).

The objective of the symposium, which took place on the fringe of the 21st convention of the ABQ, was to zero in on two decades of intervention aimed at restoring and protecting the ecosystem of the St. Lawrence River. The symposium facilitated many discussions among participants. "We wanted to group together all the people interested in the river in order to pool everyone's experiences," remarked Robert Hamelin, President of the ABQ. For those in charge of SLV 2000, the symposium was the ideal time to renew relationships with biologists and the entire team of policymakers who strive towards the improvement of the St. Lawrence.

Through the many workshops and round tables organized, participants were able to exchange information on the numerous facets of the St. Lawrence. Plenary sessions helped in pooling people's reflections. From these discussions emerged one initial, broad observation: there are many indicators that reveal a noticeable improvement in the quality of the river's water and its tributaries, especially with regard to concentrations of toxic substances and municipal wastewater which are in clear decline. However, for the time being, it is hard to obtain a global diagnosis on the St. Lawrence due to the fragmented nature of the data available.

For participants at the symposium, it is important to keep pursuing research in order to update knowledge on the St. Lawrence River. Nevertheless, scientists must be constantly driven by the desire to harmonize their work with the aims of decision-makers and communities. Performing follow-ups and assessments of the programs also appears to be essential. ▶



SUMMARY

Brigitte Debigoy

Getting the public involved

Participants lamented the fact that there is a gap between the current status of the environment of the St. Lawrence and the public's perception, which is still negative. Greater effort at educating and informing the public appears to be needed so that people realize that recovering former uses of the river is increasingly possible. Along these lines, ABQ has just reached an agreement with the Biosphere to set up an Internet site which will make it easier to disseminate information regarding the ecosystem of the St. Lawrence.

Making the public more aware of the situation is all the more important since the local communities will be playing a greater role in improving the quality of the water of the St. Lawrence. Already, effective local initiatives abound. But most symposium participants believe it essential that local populations have access to better technical and financial support. "Biologists are ready to work in partnership with the communities," commented Robert Hamelin at the close of the symposium.

Two other major points were brought to light during the conference: one, if there were a third phase in the St. Lawrence Action Plan, the control over nonpoint source pollution would undoubtedly be the next major step in cleaning up the river; and two, promoting greater access to the river so that people can appreciate this great ecosystem would encourage citizens to become involved in initiatives concerning the St. Lawrence and install a desire to protect and recover it.

The two co-chairs of SLV 2000, François Guimond of Environment Canada and George Arsenault of the Ministère de l'Environnement et de la Faune, were overjoyed at the outstanding participation at the symposium. "The comments we heard here will help pave the way for our continued application of SLV 2000," concluded George Arsenault.

First Public Consultation of the SLV 2000 Advisory Committee

Within the scope of its mandate of being "the eyes and the ears" of the public concerning their expectations of SLV 2000, the SLV 2000 Advisory Committee invited a dozen people to come and discuss the status of the Gulf in the St. Lawrence Vision 2000 Action Plan. This discussion, which took place at the Université du Québec à Rimouski last October 2, took the form of a series of short presentations by participants, followed by a question and answer period as part of the regular sessions of the committee. Guests—from varied backgrounds but all active in the lower St. Lawrence region (e.g., scientists, on-site stakeholders, ZIP committees) provided the members of the committee the opportunity to take the pulse of this vast region which extends from the Baie-des-Chaleurs to the Basse-Côte-Nord, including the Gaspé peninsula.

Most participants harboured two major concerns which came to light in the discussions. Firstly, a social preoccupation: several parties promoted the importance of the public taking part in the identification of the problems and solutions facing the inhabitants of the Gulf regions. Whether this concerns the impact of the hog breeding industry, the development of coastal regions or the decline in fishing, participants were adamant about the contributions that should be made by the local communities and the need to bring the decision-making process closer to home.

The specific nature of the marine setting is another major concern for Gulf residents. Fishery resources, marine ecosystems and the various types of pollution make such regions very different from other St. Lawrence River areas.

Finally, many people pointed out that the dispersal of populations over wide territories hinders public cooperation and participation. This state of affairs is all the more lamentable since, in these regions, the river represents more than a just waterway: it is truly a centre of attraction for a major part of the population's activities.

The Advisory Committee greatly appreciated the exchanges hinders during the consultation; they will provide food for thought for the members of the committee in the pursuit of their activities.

Water Quality in St. Lawrence's Tributaries

Since 1978, several water cleanup programs have been initiated in Quebec. What is the water quality situation today?

The goals of various water purification programs in Quebec are relatively well-known to the public: reducing specific sources of pollution such as toxic waste from industry; diminishing suspended particulates, phosphorous, organic matter and fecal coliforms in municipal and industrial wastewater; improving manure management, and so on. These efforts have all made the news in recent years.

Nearly 400 sampling stations

To find out whether the actions undertaken have made any headway, there must be a regular gauging of the quality of the water, to direct future action and change tactics, if necessary. In fact, it is the Direction des écosystèmes aquatiques of the Québec Ministère de l'Environnement et de la Faune which has the mandate of monitoring water quality. Responsible for the collection of samples and their analysis, the directorate has also been involved in the interpretation of data and the dissemination of results, since 1987.

The special river network which was set up includes 386 stations spread along the 40 drainage basins of the St. Lawrence's tributary rivers. Not all the stations have the same functions. The 130 major stations are visited on a monthly basis throughout the year. They allow for the observation of long-term trends and the seasonal monitoring of the water quality. The 230 secondary stations are also sampled on a monthly basis, but only from May to October, according to a visiting cycle of approximately five years. Finally, the 26 control stations are located in sectors which have not been very affected by man, at the head of the drainage basins. They give an overview of a waterway in its natural state, since these sectors are generally influenced by fewer disturbances and pressures than downstream.

Analysis over time and space

One year ago, the *Direction des écosystèmes aquatiques* began working on a comprehensive study of the quality of the water in tributary rivers across Quebec. The first part of this study is designed to draw a portrait of the spatial distribution and temporal evolution of the water quality. This first part is finished. The second part is designed to establish a cause and effect relationship between the water quality, the types of pressure on the waterways and the actions and programs designed to reduce pollution. The second part is currently being carried out.

"Overall, we can say that the situation has improved over the past 15 years in Quebec," indicates Jean Painchaud, a biologist with the *Direction des écosystèmes aquatiques*, and responsible for the comprehensive study on the quality of water. The current downward trend noted in levels of phosphorous, ammoniacal nitrogen, fecal coliforms and turbidity all point to Quebec as being one of the industrialized countries whose aquatic resource protection programs have produced positive results. However, the general rising trend in levels of nitrates-nitrites seems to indicate that certain pollutants are still poorly controlled."

THE QUALITY OF WATER IN QUEBEC RIVERS ACCORDING TO FOUR MAJOR DESCRIPTORS

Nitrogen (nitrates-nitrites)

The highest medians were noted in certain sectors of the following rivers: Bécancour, Boyer, Chaudière, Assomption, Richelieu and Yamaska.

Phosphorous

The highest medians were found in certain areas of the Boyer, Châteauguay, Assomption, Maskinongé, Nicolet, Richelieu and Yamaska rivers.

Fecal Coliforms

The worst results were obtained in the stations of southwestern Quebec, in the St. Lawrence downriver from Montréal, in the Saint-François river (downstream from municipalities not equipped with waste treatment plants at the time of the study) and in the St. Charles river.

Turbidity

The waterways in the basin of the Assomption River, the lower course of the Yamaska, the northwestern basins of Quebec and, more periodically, in southwestern Quebec, have a higher level of turbidity.

November 15 and 16, 1996
Eighth Edition of the Workshops on Habitat Conservation

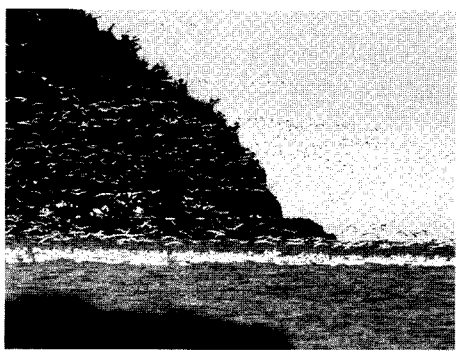
More than just a meeting...

Over the last decade, the conservation of natural environments has undergone major changes in Québec, and much effort has been devoted to the acquisition of new territories or the consolidating of sites that are already protected. To make sure that biodiversity is here to stay, we must not only be concerned with protected sites, but the rest of the territory as well. Volunteer groups have understood this and are becoming more and more involved in the preservation of natural sites. Their concern for conserving habitats and their capacity to act swiftly give them a certain advantage. Their knowledge of the major regional stakeholders is incidentally one of their biggest assets.

To support non-governmental organizations (NGOs) in their conservation endeavours, workshops on habitat conservation are organized jointly every year by Environment Canada, the Quebec Wildlife Foundation, the Québec Ministère de l'Environnement et de la Faune (MEF)—represented by two of its branches, that of wildlife and habitats and conservation and ecological heritage—and the federal Department of Fisheries and Oceans.

The goal of these workshops is to keep NGOs abreast of available conservation methods and tools in order for their endeavours to be successful. It is like a refresher course and the opportunity for all to compare a range of approaches. It is indeed a rare occurrence for the representatives of 120 different groups (bird watchers, hunters and fishers, conservation and environment groups, professionals, etc.) to get together and share their experiences and know-how on the conservation of natural habitats.

In all, some 170 people met at the Manoir du lac Delage, just north of Québec City, over the weekend of November 15 and 16 last. Twenty-nine speakers dealt with, among other topics, communications with elected representatives, the conservation and development of natural environments, ecotourism and the financial and legal aspects linked to the conservation of habitats. The themes are chosen from year to year by the participants themselves who, in so doing, make sure that the workshops truly correspond to their main concerns.



Service canadien de la faune

A variety of experiences

On the topic of dealing with elected officials, Guy Pustelnik, from the *Établissement Public Interdépartemental Dordogne* (EPIDOR), came to relate the experience of his region in France. EPIDOR has to deal with the French reality, which is strongly influenced by regionalization and decentralization. This trend is also becoming widespread in Quebec, according to Claude Hallé, a regional planner with the Jacques-Cartier regional county municipality (RCM). Con-frontations with elected officials is still not the best way to change things; it is in the interest of NGOs and municipal leaders to be open to discussion. A discussion on the drainage basin approach to management proposed by the *Comité de bassin de la rivière Chaudière* (COBARIC) was the opportunity for participants to energetically match their ideas and voice their opinions.

Several speakers of course spoke of conservation and the physical planning of natural environments and habitats, the *raison d'être* of the meetings. Without summarizing the many presentations on this topic, it should be noted that various restoration and conservation techniques were presented. Among others, Guy Lépine from the Quebec Wildlife Foundation gave a step-by-step account on how to start up a wetlands conservation project, and Denis Lehoux from Environment Canada presented the *Guide for restoring wetlands*, published last Spring.

In terms of ecotourism, Robert Michaud, from the *Groupe de recherche en environnement sur le milieu marin* (GREMM) of the Saguenay region, spoke of the difficulties that sometimes crop up when a natural milieu is more and more used by man. Several other speakers illustrated possibilities and gave accounts of projects already carried out in their region, including Bas-Richelieu, Côte-Nord, Laval and Baie-de-Saint-Augustin.

As far as financial aspects are concerned, participants were able to discuss creative approaches to financing, the sujet oblige in a period of budget cuts. In the legal sphere, there were discussions on how to negotiate with landowners and on conservation easements, which incidentally does not yet exist in Quebec. These two topics were immensely popular.

A highly efficient network

"Of all the groups represented in the workshops, close to one-third come from organizations which have been participating in the meetings since their creation in 1988," Serge Labonté pointed out. "This proves that the workshops concretely meet the needs of the organizations and that they have their place in the field of habitat conservation in Quebec. Their stimulating effect was indeed felt by all the people who, every year, help in the preparation of the workshops."

A Portrayal of Biodiversity of the St. Lawrence

With a view to perfecting a decision-making tool, and in the interest of sustainable development, a multidisciplinary team has already spent 18 months developing a portrayal of the biodiversity of the St. Lawrence ecosystem. This endeavour, which is like a jigsaw puzzle in several thousand pieces, will lead the way to new perspectives in the study and conservation of the river's biological resources.

Among the priority objectives of St. Lawrence Vision 2000, getting a better grasp on the natural and man-made factors which act on biodiversity is a priority. However, our understanding of this remains incomplete at present. Due to the multitude of sources of information and their heterogeneity, adequately describing and establishing comparisons between the river's regions and zones is quite a feat. The project of portraying the biodiversity of the St. Lawrence is an attempt to fill this gap, which presently prevents researchers from having both a global and accurate understanding of this vast river system.

Martin C. Giasson

A new methodological approach

The depiction of biodiversity of the St. Lawrence includes the production of several products which may be used both by researchers and the general public: a small-scale ecological mapping of the St. Lawrence, a knowledge-based system which will be used as a decision-making tool, several thematic maps, several data bases integrating the sampling work carried out on the St. Lawrence over the past century and a reference work of approximately 200 pages on the biodiversity of the St. Lawrence. This tool promises to be remarkable, because of both its content and its presentation.

"There is a certain confusion between this work under way and the *State of the Environment Report on the St. Lawrence River* recently published by the St. Lawrence Centre", comments Jean-Luc DesGranges from Environment Canada, co-publisher of the project and in charge of the biotic section of the *Portrayal*. While the report presented the existing body of knowledge and explained it in plain language, this work in progress is mainly using original data and not previously published material. The many experts who are part of the multidisciplinary team will be analyzing these data as a part of an ecosystemic approach, integrating the physical and biological components of the St. Lawrence."

The team is working with existing data only: more than 20,000 references, more than 250 studies and more than 50 data bases should allow the authors to reach a new understanding of the complexity of the life and the processes which maintain it in the river's ecosystem.

An exercise such as this is a first for the major river systems in the world. With the data collection phase now over, the analysis and integration phase of the data, dealing with both the physical and living environments of the ecosystem could start at the beginning of 1997. "More than one hundred of the foremost experts from all backgrounds who are studying the St. Lawrence are taking part in this work. More than 50% of these experts come from outside the government departments involved in SLV 2000."

The objective of the multidisciplinary team is to be able to model relationships which link the physical items of the riverside landscape and aquatic environments with the biological communities they shelter in order to produce a biodiversity map of the St. Lawrence. The person in charge of the abiotic section of the Portrayal of Biodiversity is Jean-Pierre Ducruc of the ecological mapping service at the Ministère de l'Environne-ment et de la Faune du Québec. ▶

Small-scale mapping of the river

"We received instruction to produce a map of ecological diversity which will give us a synoptic and complete view of the entire St. Lawrence River at a scale of 1: 1,000,000," states Jean-Pierre Ducruc. "Just like the biotic sector, we have a huge amount of poorly matched information on the St. Lawrence. Existing information was generally collected in pursuit of a specific goal, for instance, the study of shoreline and harbour facilities, or the directory of wetlands useful to migratory birds. A comparison of these sources becomes very fastidious: the scales and parametres change and we lack an overall perspective."

The current trend in mapping to better grasp biodiversity is to deal with it at the scale of the landscape. This property analysis is based on the setting's permanent physical components which are used for supporting the biotic. From the biggest all the way down to the smallest, this approach will allow us to deal with biodiversity at various levels. It really is a significant scope of work which is particularly suitable to an ecosystemic approach.

First of all, the St. Lawrence was divided into 23 ecological regions, which fall under five major zones: the river reach, the freshwater estuary, the brackish estuary, the saltwater estuary and the gulf. This division of the aquatic environment will be performed taking into account the relief and the type of substrate of the sea floor. The shoreline will be described based on coastal elements (cove, inlet, bay, relief, etc.) In addition to the global map of the St. Lawrence, one map per region at a scale of 1 : 250,000 will be produced both on paper and digitally.

Handling the computer processing tools was a source of difficulty for the multidisciplinary team. On the other hand, the work it is accomplishing is akin to one of pioneer work and land clearing techniques which will make research easier for years to come. The publication of this reference tool and the dissemination of the products linked to the project *Portrayal of Diversity* will extend from 1998 to 1999.

More Sustainable Agriculture: An Experiment

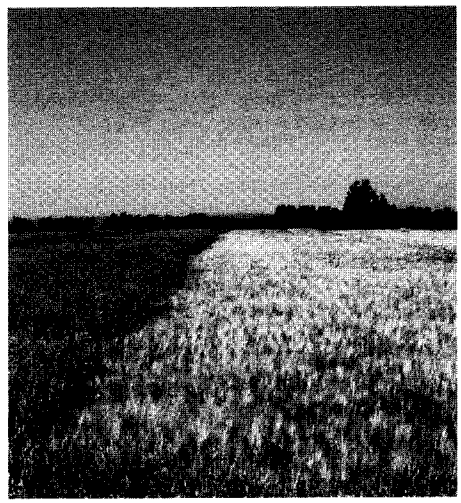
The experiment of green clubs in sustainable agriculture, which were launched in 1993, will soon be ending. What has been accomplished to date?

The program of green clubs in sustainable agriculture, started up under the Canada-Quebec Agreement for a sustainable environment in agriculture, created 12 voluntary farm groups facing similar environmental problems. The groups are located in all regions of Quebec, except in Abitibi-Témiscamingue and the Outaouais-Laurentides. Each of the green clubs brings together between 20 and 30 farm businesses. The 290 agricultural operations affected by the program had, on average, a surface area of 30,000 hectares; their major activities or crops were milk production, hog production, cereals and grains and, to a lesser degree, tobacco and potatoes.

Wanting to improve the quality of water, reduce nonpoint source pollution, and promote a better conservation of resources, the aim of the green clubs has been to support the work performed by farm operators who want to change their cultivating practices to make them more sustainable. With a budget of 2.2 million dollars spread over four years, the program started up in August 1993 and is slated to end on March 31, 1997.

An intervention strategy for each farm

"The objective of the green clubs is to help the farm producers determine their own strategy to solve their particular environmental problems," explains Pierre Beaudet, program director and agronomist with the *Direction de l'environnement et du développement durable* at the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ). The problems encountered are mostly caused by nonpoint source pollution—there are few losses per hectare but operations cover large areas. Deciding on which actions to take is therefore a complex task, and requires a solid grounding in the production system: management of fertilizers (farm or mineral fertilizers), management of organic matter, soil management, etc. The updating of farm plans and the maintenance of field logs were encouraged.



A field of oats and barley before a herbicide treatment, except for a few localized sections.

The farm plan, along with the field log, allows farmers have a complete view of their farm and have a better understanding of the different parcels. By noting the quantities and type of fertilizers that are spread, the level of fertility of the soil, the weeds present, and so on, farm producers can better plan their activities. The adoption of cultivation plans, fertilization plans, etc., completes the information-gathering stage. This might appear restrictive at the outset, but the information gathered allows for the comparison of results from one year to the next, as well as a better understanding of the issue. Certain firms even purchased a computerized field log to better monitor their operations. ▶

The profitability of the farm should not be affected

"Although the objective of the program was to improve the environmental situation of farm operations," Pierre Beaudet adds, "we must take into account the economic impact of the practices we introduce. If changes compromise the profitability of the farm over the short or middle term, the strategy has to be reassessed." The changes in attitude we see today arise from this realistic approach. In fact, a study carried out last summer showed there was a remarkable improvement in the spreading of farm fertilizers, crop rotation, soil protection and the use of herbicides. Most farmers now realize that it is by combing several different techniques that they can obtain better results.

Moreover, to better evaluate the impact of the program on the profitability of farms, a more advanced economic follow-up was made of the farm operations, belonging to both a green club and a management union, since they had comparable accounting methods. The study showed that the groups compared were relatively similar. After two years of activities, no specific differences in financial returns were noted . The study, to be completed in 1997, will allow us to validate the hypothesis that, even if a farm has implemented measures to protect the environment, its profitability has not suffer.

In agriculture, because of the change in seasons, there are delays from when a measure is implemented and when an improvement is noted. The green clubs nevertheless seem to have succeeded in proving to their members that it is possible to maintain production while minimizing environmental risks.

For the Agricultural Clean-up Component of St. Lawrence Vision 2000, the experience of green clubs in sustainable agriculture is interesting option that has its place in the range of solutions to be used to counter non-point source pollution of agricultural origin which compromises the quality of the St. Lawrence River.

Geographic Information System (GIS)

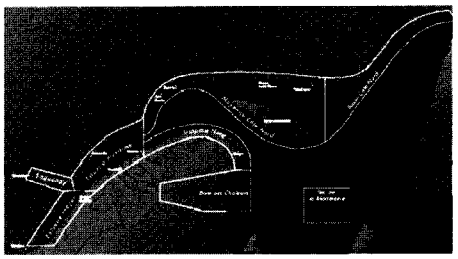
A tool for the future

A Geographic Information System (GIS) is a computer-aided cartographic system which allows for the visualization and analysis of geographical data. The Department of Fisheries and Oceans Canada (DFO), which inaugurated the GIS project on habitats in 1993, is nearing completion.

The Laurentian region was divided into 11 coastal zones; it extends from Île d'Orléans to the Gulf of St. Lawrence and also covers the Quebec northland. The zones correspond to DFO's jurisdiction in marine settings. The data bank is divided into three major themes: Habitat, Resource and Utilization. Each theme has a certain number of relevant parametres. For example, Habitat covers information concerning the coastal topography, the nature of the sea floor, the water temperature, etc.; such data allow us to glean information on fish habitats for all the zones being studied. The Resource theme holds information about the activities and life stages of the fish such as reproduction, migration, feeding, and so on. Lastly, the Utilization theme is more concerned with human activities such as aquicultural sites, fishing, conservation zones, etc.

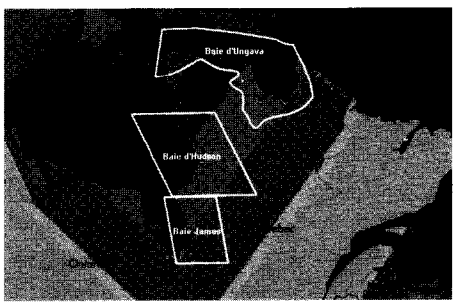
The development of the data bank is well underway. Alain Bourgeois, head of the Systems and Monitoring division and also of the task force building the GIS, says: "We will soon be able to react in real time when we have to issue notices regarding the protection of habitats." Being able to localize the habitats that are likely to be threatened, the GIS will be an indispensable tool for the assessment of projects in riparian zones, for environmental emergencies, as well as for the restoration and enhancing of habitats.

The user-friendliness of the system will allow scientists to perform swift diagnoses according to different needs. The first product to be produced by the GIS will be a series of atlases which will contain maps linked to the three themes. Other products will eventually be developed using the available data banks.



THE 11 COASTAL REGIONS OF THE GIS

Middle Estuary
Saguenay
Tidal Estuary
Moyenne-Côte-Nord
Basse-Côte-Nord
Gaspésie-Nord
Baie-des-Chaleurs
Îles-de-la-Madeleine
Baie-James
Hudson
Ungava



For the time being, the GIS will respond mainly to requests which affect one of the areas of responsibility of the DFO.

Thanks to the GIS, the DFO will be able to take stock of the sensitive zones in order to react effectively to problems in the coastal zones along the St. Lawrence and in northern Quebec.

The Virtual Elimination of Persistent and Bioaccumulative Toxic Substances

Last August, the Protection Component of St. Lawrence Vision 2000 adopted its strategy for the virtual elimination of persistent and bioaccumulative toxic substances. Below is the description of the strategy.

The virtual elimination of persistent and bioaccumulative toxic substances is a concept which can be interpreted in many different ways. In the literal sense, and for most people, 'virtual elimination' means that the toxic substances in question must not be found anywhere—in the water, air or soil—in nature. Zero tolerance, as we might put it.

Within the Protection Component of St. Lawrence Vision 2000, this objective, commendable as it is, cannot be achieved according to this definition and within the SLV 2000 deadline, not to mention that it greatly overstepped the responsibilities of the Component's managers. As a first step, the experts had to adopt a methodology and objectives that were realistic and that would lead to measurable results. It was initially decided that the activities would be limited to the effluents of the 106 industrial plants targetted by SLV 2000.

"Then, we reviewed the North American policy principles that refer to the virtual elimination of toxic substances," stated François Rocheleau, coordinator for the SLV 2000 regional operations of the Protection Component and chemist for the Ministère de l'Environnement et de la Faune (MEF). "The Canadian-American strategy for the virtual elimination of toxic substances in the Great Lakes, the 1995 federal policy of toxic substance management and the approach recommended by the MEF called *Environmental Discharge Objectives (EDO)* have many points in common. Nevertheless, the latter presented several advantages and the members on the Harmonization Committee of the Protection Component unanimously deemed that this approach fit well within the gradual approach which was necessary.

Indeed, the EDO have proven their salt for several years and now the principle is well accepted by the industry. Furthermore, the EDO are based on an approach which focuses on the recovery of all uses of waterways which are well integrated into an ecosystemic vision of the protection of the environment.

Environmental Discharge Objectives (EDO) and the Protection Component Strategy

The EDO approach, because it is also expressed, among other items, in the form of concentrations which are tolerable to the effluent, provides a simple way of measuring and evaluating the progress toward the objective of the virtual elimination of toxic substances. Checking on the elimination of a substance is done according to the protocols designed to attain at least the levels of analytical performance stipulated in the *SLV 2000 General Guide to Property Analysis.* If the method chosen does not allow us to give a categorical verdict, the demonstration should call upon a more in-depth investigation. The responsibility of reaching the EDO for a substance will then rest upon the plant, and not SLV 2000. ▶

HOW CAN WE GET RID OF PERSISTENT TOXIC SUBSTANCES?

PCBs

PCBs can still be found in the effluents of plants that recycle paper, since some countries still allow their use in printing inks. The solution to favour: a better selection of paper for recycling.

Benzo(a)pyrene

Benzo(a)pyrene generally originates from old aluminum smelters that are still using the Soderberg process. There is only one real solution for this: stop using the Soderberg process.

Mercury

Mercury is mainly found in metallurgic and inorganic chemical industries. However, it is one element that is found in nature and that is often present in raw materials; it is very difficult to require a 'zero' emission for mercury.

Dioxins and furans

The chorine bleaching of pulp and paper in Quebec is a major source of dioxins and furans. The recent regulations and changes in plant processes have reduced them to a great extent.

Hexachlorobenzene

Since hexachlorobenzene was not detected in the priority plants of the St. Lawrence Action Plan, it is not very likely, although still possible, that this substance may be found in the effluents of the plants targetted by SLV 2000. The usual checks will be made.

Presentation of the Health Assessment of Several ZIPs

Last September and October, the Health Component presented the public with the health assessments of ZIPs in the Montreal, Longueuil, Lake St. Louis and Lake St. François regions, as well as that of the tidal estuary. The technical reports on the biological, socioeconomic and physico-chemical aspects had already been presented in 1994, at a time when the Health Component was not yet a part of the SLV 2000 family. The consumption of fish, game, crustaceans and drinking water, as well as leisure activities were among the topics treated in these health assessments, and below are the highlights.

Fish consumption

The Assessments showed us that the consumption of fish is the main source of exposure to the chemical contaminants found in the St. Lawrence River. However, the health risks linked to the consumption of fish caught in the Montreal region are considered to be negligible if such consumption follows the recommendations set out in the guide book on the consumption of sportfishing catches in Quebec's freshwater (in French only) published jointly by the Ministère de l'Environnement et de la Faune and the Ministère de la Santé et des Services sociaux du Québec. For the tidal estuary, with the exception of the sector of the Baie des Anglais where some restrictions apply, health risks linked to the consumption of fish and seafood are also considered to be negligible. Indeed, for this study sector, the contamination of mollusks by toxic algae and pathogenic microorganisms is the major concern for public health.

Water consumption

The results of the physico-chemical and microbiological analyses available on drinking water drawn from the St. Lawrence in the Montreal region indicate no significant health risk for the public.

Recreational activities

The microbiological quality of the raw, or untreated, water in the study areas of Lake St. Louis and Lake St. François is generally acceptable for swimming and other activities where there is direct contact with the water (e.g., windsurfing, water skiing and canoeing). It is a different story, however, for Montreal and Longueuil areas where high levels of fecal coliforms for swimming criteria limit access to the river. In the tidal estuary, the discharge of untreated wastewater most likely compromises the practice of recreational activities in many locations. Nevertheless, before practising a direct contact activity, it is important to check whether recent analyses have been carried out to assess the cleanliness of the water, regardless of the area.

Still on the topic of recreational activities, one-third of nautical accidents which occurred along the St. Lawrence River in 1995 and required assistance from a Maritime Rescue Centre were in the Lake St. Louis, Lake St. François and Montreal-Longueuil regions. Finally, scuba diving is apparently the main cause of death associated with nautical activities for the study area of the tidal estuary.

Persistent and bioaccumulative toxic substances

The list of 11 persistent and bioaccumulative toxic substances referred to when we speak of virtual elimination within the Protection Component, was established using the list proposed by the International Joint Commission. The first seven substances—dieldrin/aldrin, mirex, DDT/DDD/ DDE, toxaphene, hexachlorobenzene, alkyl leads and polychlorinated biphenyls (PCBs)—are no longer used and marketed in Canada and are not likely to be found in the effluents of industrial plants, except for hexachlorobenzen and PCBs because of certain industrial processes. The other toxic substances which might be found in the effluents are benzo(a)pyrene, mercury and dioxins and furans.

A long-term strategy

The strategy adopted by the Protection Component is the first step toward the virtual elimination of persistent and bioaccumulative toxic substances. Considering that it is one major step in the right direction, the managers of the Protection Component are confident that this approach will be used as a basis for programs aimed at completely eliminating the 11 substances identified by the plants targetted by SLV 2000, either through toxic effluent source management policies (prevention strategies), or the reduction or removal of such substances (clean-up strategy).

LETTERS to the Editor

LE FLEUVE OPENS ITS PAGES TO ITS READERS

Among the suggestions we received through the survey we carried out last summer, a *Letters to the Editor* column in which readers could voice their opinions was a popular request.

The editorial committee recently decided to increase the number of pages in the newspaper *Le Fleuve*—which will from now on be 12 pages—, and give you the opportunity to air your views. Do you have questions about certain articles? Perhaps you would like to find out more about an SLV 2000 program? Or you might like to share your concerns with the other readers of *Le Fleuve*. Send us your comments to the following address:

Letters to the Editor

Le Fleuve Newsletter
St. Lawrence Vision 2000
1141, route de l'Église, 1st Floor
C.P. 10100
Sainte-Foy, Québec
G1V 4H5
Or, fax us at (418) 648-3859, or send us E-mail (dugasc@cpque.am.doe.ca).

WE'RE WAITING TO HEAR FROM YOU!

Don't miss the next issue

On the heels of the symposium *The St. Lawrence—For Life* which was held last November, the next issue of *Le Fleuve* will be devoted entirely to the challenges facing the St. Lawrence ecosystem over the next few years. The enthusiastic interest for the participants' conferences and the overwhelming success of the symposium convinced us to dedicate a special issue to it.

RECENT PUBLICATIONS

The Series Ecosystèmes aquatiques

RIVIÈRE CHÂTEAUGUAY

Qualité des eaux du bassin de la rivière Châteauguay, 1979 to 1994 **(Catalogue No. 96-3459-09, French-language only)**, Marc Simoneau, Biologist, MEF

This publication is a depiction of the quality of the surface water of the Châteauguay river basin in a space and time-frame supported by data gathered on-site. In addition to the detailed findings on the physico-chemical and bacteriologic quality of the water, the report contains information on socioeconomic factors that may explain the measured trends or findings.

Le bassin de la rivière Châteauguay: contamination de l'eau par les métaux et certaines substances organiques toxiques **(Catalogue No. 96-3460-09, French-language only)**, David Berryman, Biologist, MEF

This is a study on the contamination of the water contained in the Châteauguay river basin by twelve metals, certain pesticides and a range of semi-volatile organic compounds and fatty and resin acids.

Le bassin de la rivière Châteauguay: les communautés ichtyologiques et l'intégrité biotique du milieu **(Catalogue No. 96-3461-08, French-language only)**, Nathalie La Violette and Yvon Richard, Biologists, MEF

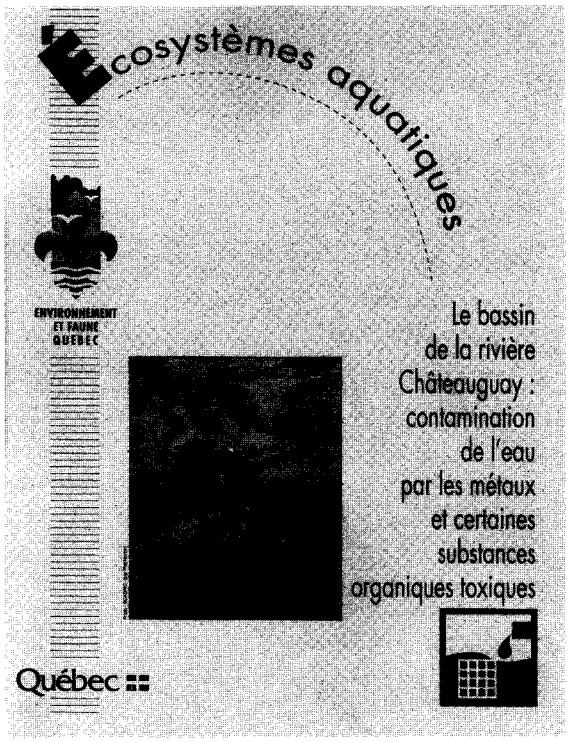
The evaluation of the impact of urban, industrial and agricultural pressure on the biotic integrity of the fish communities, as well as the biotic integrity index (BII) of the 69 kilometres under study.

Le bassin de la rivière Châteauguay: les communautés benthiques et l'intégrité biotique du milieu **(Catalogue No. 96-3462-08, French-language only)**, Jacques St-Onge, Biologist, MEF

The evaluation of the effect of pollution on the composition of the benthic communities, as well as the global biological index (GBI) of the 69 kilometres under study.

Le bassin de la rivière Châteauguay: teneurs en mercure et en BPC des poissons capturés en 1983 et 1993 **(Catalogue No. 96-3463-09, French-language only)**, Denis Brouard, Consultant, and Denis Laliberté, Chemist, MEF

A comparison between the median content in mercury and PCBs in eight species of fish caught in 1983 and 1993.



Le bassin de la rivière Châteauguay: état de l'écosystème aquatique Rapport synthèse **(Catalogue No. 96-3464-09, French-language only)**, David Berryman, Marc Simoneau, Jean Caumarin, Nathalie La Violette and Jacques St-Onge, Biologistes, MEF.

This is a summary of the conclusions supported in the five thematic reports on the contamination of water and fish by metals and certain toxic organic substances, the ichtyological and benthic communities and the general biotic integrity of the aquatic ecosystem.

The State of the Aquatic Ecosystem of the Châteauguay River and its Watershed, 1979-1994 **(Catalogue No. 96-3445 A-09)**, Direction des écosystèmes aquatiques, MEF.

A popularization of the six specialized studies depicting the Châteauguay river drainage

basin, the health status of the fish, the contamination of the flesh of several species of interest to sport fishers (e.g., pike, walleye, smallmouth bass), as well as water quality.

RIVIÈRE SAINT-FRANÇOIS

Le bassin versant de la rivière Saint-François: contamination de l'eau par les métaux et certaines substances toxiques organiques **(Catalogue No. 96-3163-08, French-language only)**, David Berryman, Biologist, MEF.

A depiction of the contamination of the water in the Saint-François and Magog river basins by twelve metals, organochlorine pesticides, dioxins and chlorine furans and a range of PAHs, as well as fatty and resin acids.

Le bassin versant de la rivière Saint-François: contamination du poisson par les métaux et certaines substances toxiques organiques **(Catalogue No. 96-3161-08, French-language only)**, Sylvain Primeau, Biologist, MEF.

An evaluation of the contamination by mercury and PCBs of the flesh of fish species of interest to sport fishers in the Saint-François and Magog river basins.

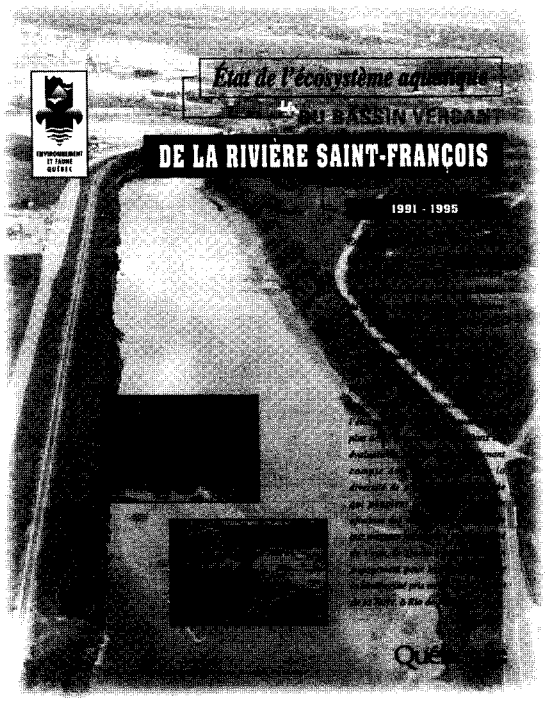
Le bassin versant de la rivière Saint-François: les communautés ichtyologiques et l'intégrité biotique du milieu **(Catalogue No. 96-3164-08, French-language only)**, Yvon Richard, Biologist, MEF.

The effects of pollution on the composition of the fish communities, as well as the biotic integrity index (BII) of the 188 kilometres under study.

Le bassin versant de la rivière Saint-François: les communautés benthiques et l'intégrité biotique du milieu **(Catalogue No. 96-3164-08, French-language only)**, Yvon Richard and Jacques St-Onge, Biologists, MEF.

The effects of pollution on the composition of the benthic communities, as well as the global biological index (GBI).

Le bassin versant de la rivière Saint-François: état de l'écosystème aquatique et contamination par les substances toxiques



Rapport synthèse **(Catalogue No. 96-3376-08, French-language only)**, David Berryman, Sylvain Primeau, Yvon Richard and Jacques St-Onge, Biologists, MEF.

A summary of the conclusions supported in the four thematic reports on the contamination of water and fish by metals and certain toxic organic substances, the ichtyological and benthic communities, and the general biotic integrity of the aquatic ecosystem.

État de l'écosystème aquatique du bassin versant de la rivière Saint-François, 1991-1995 **(Catalogue No. 96-3319-08)**, Direction des écosystèmes aquatiques, MEF.

A popularization of the five specialized studies drawing a portrait of the drainage basin of the Saint-François and Magog rivers on state of health of the fish, the contamination of the flesh of several species of interest to sport fishers (e.g., Northern pike, walleye, bass), as well as the quality of the water.

The above publications in the series Écosystèmes aquatiques may be obtained at the:

Information desk, Ministère de l'Environnement et de la Faune, 150, boul. René-Lévesque Est, ground floor (Québec) G1K 4Y1. Tel: (418) 643-3127. Toll-free: 1-800-561-1616.

Series of fact sheets called St. Lawrence Technologies

Industrial wastewater—Technological adaptation of a physico-chemical treatment process for the effluents of a paperboard and tile-backing mill

This fact sheet presents the findings of a development and technological demonstration project carried out jointly by the Centre de recherche en pâtes et papiers of UQTR, Cascades Lupel inc. and Cascades inc.

Industrial wastewater—An extended wastewater treatment system

This fact sheet presents the findings of a technological development project carried out at the Biosphere of Environment Canada by the Institut de recherche en biologie végétale in conjunction with the Fondation universitaire luxembourgeoise, le groupe Steica inc., le Groupe Sodinco inc. and Soprin Experts-conseils.

You may obtain a copy of these fact sheets in the series St. Lawrence Technologies at Environment Canada, Technological Development Section, 105, rue McGill, 4th Floor, Montreal (Québec) H2Y 2E7 Tel. (514) 283-9274

Synthèse des connaissances sur les risques à la santé humaine reliés aux divers usages du fleuve Saint-Laurent dans les secteurs d'étude lac Saint-François, lac Saint-Louis et Montréal-Longueuil (Available in French only)

Synthèse des connaissances sur les risques à la santé humaine reliés aux divers usages du fleuve Saint-Laurent dans le secteur d'étude Estuaire maritime (Available in French only)

You may obtain these documents at the Centre de santé publique de Québec, by calling Renée-Claude Landry at (418) 666-7000, extension 311.

River Islands and Shores: The Myriad Faces of the St. Lawrence, Environmental Atlas of the St. Lawrence, Full-colour atlas plate 64 x 110 cm

The St. Lawrence Centre has just released the twelfth in the series of atlas plates of the Environmental Atlas. It illustrates the typical environments (i.e., strands, heathlands and bogs) that make up the shores and islands of the River, their ecological role and the natural and human factors which explain to their dynamism.

You may obtain your copy of this by contacting the St. Lawrence Centre at 105, rue McGill, Montreal (Québec) H2Y 2E7, Tel: (514) 283-7000.

AGENDA

- **Americana '97, March 18 to 21, 1997, at the Palais des congrès in Montreal**

CONTACTS

The St. Lawrence—for Life

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Eighth Edition of the Workshops on Habitat Conservation

Serge Labonté
Environment Canada
Tel: (418) 648-7138

A More Sustainable Agricultural Experience

Pierre Beaudet
Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec
Tel: (418) 644-5602

First Public Consultation of the SLV 2000 Advisory Committee

André Delisle
SLV 2000 Advisory Committee
Tel: (418) 872-8110

The Virtual Elimination of Persistent and Bioaccumulative Toxic Substances

Gaétan Duchesneau
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Ministère de l'Environnement et de la Faune du Québec
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Francine Richard
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Tel: (418) 521-3820, extension 4767

Geographic Information System (GIS)

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Presentation of the Health Assessment of Several ZIPs

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Denis Gauvin
Health Canada / Centre de santé publique de Québec
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Water Quality in the St. Lawrence's Tributaries

Jean Painchaud
Ministère de l'Environnement et de la Faune du Québec
Tel: (418) 521-3820, extension 4704

A Portrayal of Biodiversity of the St. Lawrence

Jean-Luc DesGranges
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Tel: (418) 648-7225

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LE FLEUVE

NEWSLETTER
St. Lawrence Vision 2000

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Management and Coordination:
Communications Component
St. Lawrence Vision 2000

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