LE FLEUVE

NEWSLETTER
ST. LAWRENCE VISION 2000
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IN TUNE

FOR "GREENER" AGRICULTURE

Problems affecting the quality of water due to agricultural non-point source pollution are not yet completely understood. The wide variety of transportation mechanisms and the degradation of these pollutants is such that the same sources do not necessarily have the same effects.

Furthermore, the farming community is segmented into thousands of small and medium-sized farm businesses, or SMBs, with their own ways of doing things, their own traditions and their own perception of procedures. Intervening in such an environment requires new approaches.

The Agriculture Component of St. Lawrence Vision 2000 is a first with regard to the St. Lawrence Action Plan: the latter has no agricultural application. With a budget of $400,000, the Component cannot become involved in large-scale interventions to solve a still largely misunderstood problem. That is why emphasis has been placed on four drainage basins of the St. Lawrence ecosystem: those of the Boyer, Chaudière, L'Assomption and Yamaska rivers.

Representative of the extent of deterioration of many streams and rivers in farming regions, three of these rivers are among the most polluted in Quebec. The agri-environmental assessment should enable us to decide on the path to take in the coming years and to help extend the clean-up initiatives to the other drainage basins of the St. Lawrence Valley.

The Harmonization Committee

The Agricultural Component

A Realistic Approach

Farm pollution, due to its rather diffuse nature, took more time than urban and industrial pollution (whose effects are more specific) to occupy the agenda of experts and invade the public's consciousness. Indeed, farm pollutants of unconcentrated sources reach waterways through surface runoff, groundwater flow and soil erosion. Together, these sources can have quite an impact, especially for the St. Lawrence ecosystem. However, taken individually, their repercussions can appear harmless and of little importance. And to most people, they are often invisible.

The eroding riverbanks are propitious to the waterways' contamination by farm pollutants.

Therefore, the aim of the Agriculture Component is to properly ascertain the sources of farm pollution through a massive gathering of information on the four drainage basins of the most polluted waterways of the St. Lawrence Valley: the Boyer, Chaudière, L'Assomption and Yamaska rivers. "We want to draw the most precise agri-environmental portrait possible of the four drainage basins ▶

SUMMARY

under study," declares Esther Côté, an economist with Agriculture and Agri-food Canada and federal Co-Chair of the Component. "We need to accurately determine the nature, causes and the location of the problems encountered if we want to then put in place concrete projects that are truly effective. We have realized, since the inception of St. Lawrence Vision 2000, that our initial objectives were overly ambitious with regard to what we knew on agricultural non-point source pollution, and we have modified our ambitions since."

To adequately establish agri-environmental diagnoses of the four drainage basins, it is necessary to gather information on the use of the land, the quality of the water and the corrective measures already undertaken. "The Agriculture Component of SLV 2000 is only the beginning of the pollution management efforts that will be needed in the years to come," adds Henri Durocher, from the Quebec Ministère de l'Environnement et de la Faune (MEF), and provincial Co-Chair of the Component. "Much has already been accomplished in the municipal and industrial sectors. In the farm community, there will be major changes affecting farm producers specifically. We must strive for a fair balance between the imperatives of protecting the environment and the economic constraints of farmers, in a perspective of sustainable development. In a nutshell, we must combine economics and environment. In my opinion, the challenge lies more on that level than on a technical level. That being said, we still have to better grasp the issues facing us and to weigh possible solutions before putting actions into practice."

Among the activities of the Agriculture Component, the follow-up of small-scale pilot projects in the four drainage basins is another way to better contend with the technical difficulties involved and to seek the reactions of farmers. "The experience of other groups has shown that actions carried out on a small scale lead to the best results," continues Esther Côté. The budgets we have do not allow us incidentally to tackle new projects; we are therefore bound to the Community Involvement Component and to projects that were launched under the Green Plan to initiate actions in the four drainage basins." The projects of the Green Plan include that of the Turmel Stream in the Chaudière Basin, and that of the Saint-Esprit Stream in the L'Assomption River Basin; the Boyer River Basin houses the farm diagnosis project, linked to the Community Involvement Component. We are still searching for a small-scale project for the Yamaska River Basin.

"Over the coming years, we will have to spend more and more efforts in agricultural clean-up endeavours," states Henri Durocher. "We must bring in legislation, continue to inform and educate the public, and come up with monetary incentives so that producers who make the shift to sustainable development remain competitive."

The Agriculture Component is a step in the right direction. In the middle term, experts and managers are striving to carry out a farm clean-up plan for the entire territory. The plan could involve both individual choices and societal choices. The agriculture of tomorrow will likely be much different than that of today.

The Saint-Esprit Stream Project

Since November 1993, one of the pilot projects of the Drainage Basin Water Management Component related to the Green Plan (**nom à vérifier) is being conducted in one of the sub-basins of the L'Assomption River, a result of the Canada-Quebec auxiliary agreement for sustainable environment in agriculture. The drainage basin project of the Saint-Esprit Stream covers a territory of 2,200 ha, 1,656 of which are suitable for cultivation. Its objective is to reduce the repercussions of farming techniques on the environment without affecting the profitability of farming.

"The drainage basin is a stimulating context, conducive to making things happen," points out Éric Léger, the project's environmental consultant. "The human level we are working on teaches each person that his or her actions have a real impact on the environment and especially on the quality of the water." The impact and yield of many conservation techniques are measured by a series of small projects – tests of sorts – carried out by the various voluntary producers. The economic consultant visits each farm on the territory and devises a personalized fertilization plan that takes into account the intake of available organic fertilizers. Based on the plan, each producer decides on the extent of his or her participation.

The plans are guided according to the various cereal (maize and soya) and hothouse crops, since the reports of the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ) appear to indicate that the inputs used for field crops and for hothouse crops are, to a great extent, the cause of a degradation in the quality of water. In the Saint-Esprit Stream Project, we decided to promote the most ecological solutions to this problem.

Farmers involved in the project are backed by the Société d'agriculture du comté de Montcalm and, as to the environmental and scientific monitoring, by MacDonald College of McGill University. The MAPAQ provides scientific and administrative support through a follow-up committee within its Direction de l'environnement et du développement durable. Among the practices of sustainable agriculture being tested, let us point out integrated fertilization, compost as fertilization, herbicide-free maize, the enhanced use of slurry in post-emergence cropping techniques, ground covers, reduced soil ploughing and the biological control of insect pests in cruciferous plants. The aim is to come up with a model that can be applied elsewhere in Quebec.

Begun in November 1993, the drainage basin project of the Saint-Esprit Stream is slated to continue until March 1997. By then, it will have covered four growing seasons.

One should note that the Agriculture Component of SLV 2000 will closely scrutinize this pilot project, as well as those under way in the Boyer River and the Turmel Stream in order to judge their applicability on a greater scale.

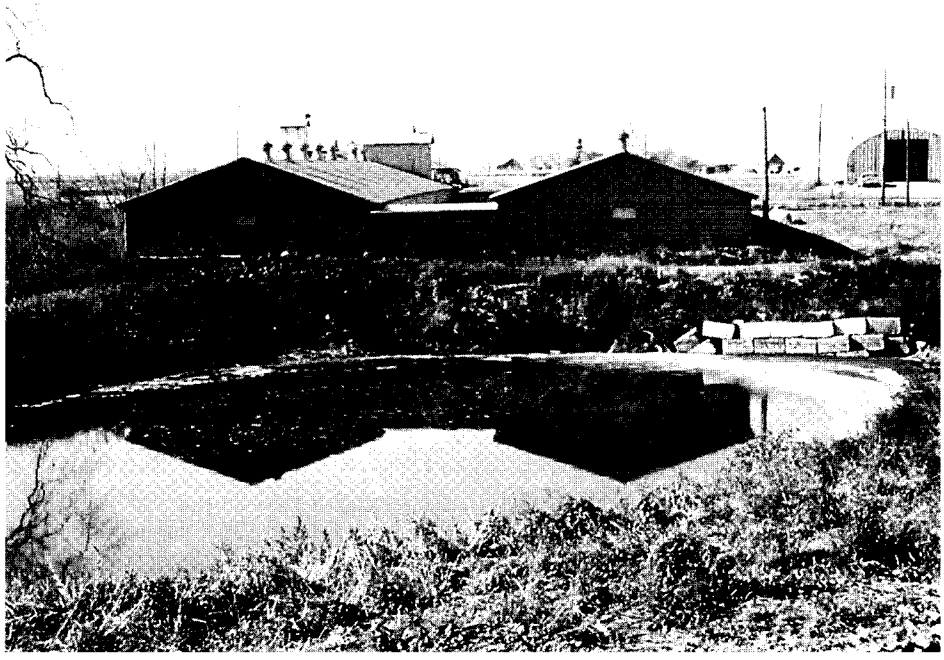
A Special Challenge

Underneath the lush green meadows, several farming regions are facing serious environmental difficulties.

Since the mid-1960s, Quebec agriculture has undergone a veritable revolution due to the dictates of modern productivity. Crop specialization, intensification of certain vegetable crops (e.g., maize) and livestock breeding (e.g., pigs) along with the mechanization of cropping procedures have, of course, led to enhanced farm production in Quebec, but they have also completely transformed farming activities. According to Pierre Vallée, an engineer and agronomist from the Quebec Ministère de l'Environnement et de la Faune (MEF), "we often speak of an industrial agriculture rather than a traditional one, of producers rather than farmers (...). This change in vocabulary reflects the important radical change all parties involved in the sector – a very dynamic sector of the Quebec economy at that – have had to make."

Some of these transformations have left their mark on the environment. When we know that barely 2% of the Quebec territory is used for agricultural purposes and that farming mostly takes place in the lowlands of the St. Lawrence Valley, it is easy to imagine that the pressure exerted on the soil and waterways has increased considerably over the past 30 years. Contrary to pollution caused due to urbanization and industrialization, more selective and easier to ascertain and localize, farm pollution is non-point source pollution, that is, it is manifested through the additive effect of multiple sources of contamination that seem harmless at first glance.

"We are dealing with more than 35,000 SMBs, all of them different from each other," reports Marcel Gaucher of the MEF. This diversity in farm operations, as well as the great variability in natural features (types of soil, topography, drainage), lessening or exacerbating the migration of contaminants outside the farm, make the problem even more complex.



Inadequate storage of manure is at once a source of microbic, organic and chemical pollution.

"This complexity means that there is no easy solution in this field; the agri-environmental issues require an approach completely different from that used to solve urban and industrial pollution," adds Marcel Gaucher. Indeed, we cannot imagine establishing effluent standards to solve the problem of non-point source pollution; the entire farm production system has to be rethought in order to reduce contaminants at their source.

Despite the investments made until now to clean-up the water, the follow-up on water quality in several rivers such as the L'Assomption, Bécancour, Châteauguay, Chaudière, Etchemin, du Nord, Richelieu, Saint-François and Yamaska often improved only locally. "We could not obtain a significant improvement in the quality of water in these rivers without solving the problem of non-point source pollution of farm origin," Pierre Vallée goes on to say.

A poor cousin of the Programme d'assainissement des eaux du Québec, or the Quebec Water Quality Monitoring Program, and SLV 2000, "farm clean-up is at its beginnings; the expertise of researchers and consultants in the field is still very limited and practically everything still has to be developed," points out Marcel Gaucher. The only consolation is that most countries are back at square one in farm clean-up. The challenge still lies ahead.

An Insidious Form of Pollution

Although agricultural pollution is more important than that of urban and industrial pollution in certain rivers, only a well-trained eye can usually detect its sources:

- Farming techniques: soil left with no plant cover most of the year (e.g., maize crops) increases the risks of soil erosion, causing the soil particles to be washed away by runoff towards the waterways; ▶

- Drainage of farmland: many such drainage installations destroy the wetlands and speed up the erosion of the banks of streams and rivers;
- Inadequate storage and spreading of animal excrement: a source of microbic, organic and chemical pollution;
- Overfertilization: the surplus of nutritive substances (nitrogen, phosphorus) not assimilated by the plants and exceeding the retention capacity of soils are washed away towards the waterways and underground water;
- Routine use of pesticides: a portion of the pesticides used to protect vegetation reaches the waterways or leaches down to the underground water.

Farming techniques

An inventory on the degradation of farm soils in Quebec, conducted in 1990 under the Canada-Quebec Subsidiary Agreement on Agri-food Development warned that the intensification of monoculture lay at the basis of the environmental problems related to such techniques. The degraded soil then becomes more vulnerable to erosion.

Drainage of farmland

A vast farmland drainage program undertaken in Quebec at the beginning of the 1970s in order to allow for the expansion of certain monocultures, maize in particular, the cultivated areas of which increased more than tenfold between 1961 and 1991.

The spring swelling of waterways and the sedimentation of eroded soils required the harnessing of the hydrographic network in the lowlands of the St. Lawrence Valley. Approximately 20,000 km of waterways were straightened and dredged in order to evacuate the surplus water. In so doing, close to 40,000 km of natural shoreline were artificially "redesigned", not counting the destruction of many wetlands whose areas decreased by 40% in the St. Lawrence Valley.

Inadequate storage and spreading of animal excrement

Every year, close to 24 million cubic metres of manure are produced in livestock farms in Quebec. They contain nutritive elements such as nitrogen, phosphorus and potassium, as well as pathogenic organisms.

The specialization of livestock breeding and its concentration in certain drainage basins, especially pig production – which more than tripled between 1961 and 1991 to reach more than three million animals – caused a geographic dissociation between crop output and livestock production. The natural recirculation of such matters for the purposes of fertilizing crops was therefore broken, creating considerable surpluses of manure, especially in the Chaudière, Yamaska and Assomption river basins.

Often inadequate manure storage structures contribute in this way to the pollution of the waterways. For several tributaries in the St. Lawrence lowlands, there is a clear relation between the total amount of nitrogen measured at their mouth and the density of the pigs and cattle population on their respective territories.

Overfertilization

Although the total quantities of manure have remained constant over the past decades, they now tend to be concentrated in certain regions.

Despite a 30% drop in cultivated land between 1951 and 1991, the use of mineral fertilizers jumped from 125,000 to 500,000 tonnes per year for the same period. This intake of fertilizers is in addition to the 24 million cubic metres of manure as mentioned earlier. Mineral fertilizers, that farmers consider to be much easier to use, compound the problems of overfertilization in certain regions.

Nitrogen, highly soluble in the form of nitrates, is easily found in rivers and streams and may infiltrate down to the groundwater, making it unfit for human consumption. The phosphorous absorbed by the particles in the soil may reach the waterways through erosion. When its accumulation in the soil is high, it can also be carried off, in a dissolved form, in runoff water or leached to the underground water. These fertilizers, overly present in the waterways, promote an excessive growth of algae and aquatic plants that end up strangling other forms of aquatic life. In recent years, data compiled by the MEF show that, in the Chaudière, L'Assomption and Yamaska rivers, phosphorous greatly exceeds the protective criteria for aquatic life.

Routine use of pesticides

In spite of a decrease in the amount of cultivated land between 1978 and 1992, the use of pesticides has risen by 82% over the same period. Close to 320 different products were used in agriculture in 1992, particularly against weeds (herbicides), insects (insecticides) and fungal diseases (fungicides). This substantial rise is partly attributable to advances in maize crops, which alone are responsible for close to 50% of all pesticides used in agriculture.

It is often the pesticides used in maize crops, for instance, that are the most often detected in waterways where this production is concentrated, especially in the Yamaska and L'Assomption rivers. The protective criteria for aquatic life are incidentally often exceeded for certain pesticides in summer. At any given time, up to 13 different pesticides can be detected; we are now concerned about the cumulative effects of these toxic substances on aquatic creatures and on drinking water.

The detection of pesticides in underground water, particularly in the areas where potatoes are cultivated due to the sandy soil, is also worrisome since these products break down very slowly.

A Shift Towards Sustainable Agriculture

The image of healthy living in the country has been questioned. Now, people are seeing that, underneath the lush green meadows, several farming regions are facing serious environmental problems.

"Even if much remains to be done in the way of educating the farming community," notes Marcel Gaucher, "we have observed that the majority now agree that there is a problem and that it has to be addressed; some avant-garde farmers are already taking the initiative. A few years ago, this was far from being the case."

Agricultural pollution calls for solutions that respect an integrated vision of resource management, whether it is at the size of the farm or the drainage basin level. It is not always easy knowing where to start, since the priority problems vary from one farm to another and from one drainage basin to another.

Before initiating costly changes in their operations, farmers must be able to properly

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The Agri-Environmental Diagnoses of the Drainage Basins Studied by SLV 2000

In the Agriculture Component of SLV 2000, four agri-environmental diagnoses conducted specially on the drainage basins of the Boyer, Chaudière, L'Assomption and Yamaska rivers have been ongoing since June 1995. Based on existing data and available documentation, the Agriculture Component is attempting to illustrate a first-time picture of agricultural pollution for each of the basins in order to be able to pinpoint vulnerable zones and better plan truly efficient actions. The Direction des politiques des secteurs agricole et naturel is the main player in this study; it is backed by the partners of the Component, who are Agriculture and Agri-Food Canada, Environment Canada and the Quebec Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ).

"Our objective is to prepare a report for each of the major contaminants of farm origin, be they nitrogen, phosphorous, soil particles and pesticides, and to comment on them in the same document," explains Guylaine Dubé, an engineer and agronomist at the Ministère de l'Environnement et de la Faune du Québec (MEF). "The diagnoses established in the past were conducted using river analyses carried out under the Programme de suivi de la qualité de l'eau (Water Quality Monitoring Program) of the MEF; it is the first time that the risks of contamination and contribution of farmland will be assessed, enabling us to quantify the causes of the deterioration of the four waterways under study."

Formulating Diagnoses

Diagnoses will be proposed, based on the data contained in the registration cards given to the MAPAQ by farm producers. The MEF will use much of the descriptive data, in particular, those on the use of the land (the surface areas cultivated for cash crops: cereals, forage, fruit, vegetables, other crops), those with regard to livestock breeding (dairy and beef cattle, pork, poultry and others), and those with regard to the quantities of mineral fertilizers sold with a view to constituting bases on the various drainage basins. These data, dating back to 1995, will be broken down according to municipality and will allow researchers to estimate the intake of fertilizing elements as well as the fractions extracted, stored, and perhaps lost to the environment.

For each of the four drainage basins targeted, the preliminary plan of each diagnosis provides for the following items: 1) an introduction reporting on the specific problems facing a drainage basin; 2) the use of soil and water as resources; 3) the quality of the water; 4) the environmental actions already undertaken; 5) the conclusions that will link the quality of water to the use of the territory, among other things. "Since this is a first in Quebec, the first four diagnoses will provide us with a fair reflection of the agri-environmental situation for the basins targeted by SLV 2000," specifies France Delisle, an agronomist with the MEF.

These diagnoses are prepared with a specific clientele in mind who are already very familiar with farm management issues: producers, managers and environmentalists. "In fact, these diagnoses will help lay the groundwork for an intervention plan for drainage basins," notes Guylaine Dubé. "It is not up to us to decide for the people in the field what they must or must not do. We can suggest avenues, but it is up to the users of the resource to choose the priorities relating to their objectives."

The Future

The problematic of agricultural non-point source pollution requires a minimum of preliminary reflection before initiating actions which may seem to be very positive, but which may likely produce only meagre results in regard to the implementation methods. "In that vein, the diagnoses, despite the modest budgets we have to carry them out, will undoubtedly steer us away from investing in interventions that are not optimal from an environmental viewpoint," states Guylaine Dubé.

The team in charge of the diagnoses at the MEF comprises Yves Bédard, engineer, France Delisle, agronomist, Nicolas Lehoux, engineer, and Yolaine Blais, engineer, under the coordination of Guylaine Dubé. The preliminary timetable provides for the publication of these diagnoses in the spring of 1997.

FEATURES OF DRAINAGE BASINS

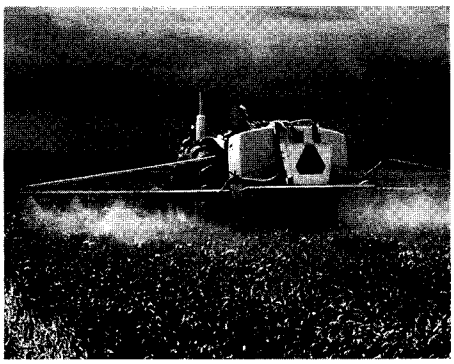
	Boyer	Chaudière	L'Assomption	Yamaska
Surface area of basin	217 km^2	6 682 km^2	4 220 km^2	4 784 km^2
Population*	5 850	150 000	133 630	220 000
Natural regions	Upstream: Appalachians Downstream: St. Lawrence Lowlands	Upstream: Appalachians Downstream: St. Lawrence Lowlands	Upstream: Laurentian Plateau Downstream: St. Lawrence Lowlands	Upstream: Appalachians Downstream: St. Lawrence Lowlands
Forest cover	40%	66%	68%	28%
Farmland	59%	30%	21%	67%
Major production	Dairy cattle	Dairy cattle, pigs	Dairy cattle, pigs, maize	Dairy cattle, pigs, maize

**1986 figures.*

A First in the St. Lawrence Valley

In order to better understand the particularities of all the farming techniques used in Quebec, the Bureau de la statistique du Québec conducted a vast survey among farmers in 1995.

A good indicator of the pressure exerted through agriculture on the quality of the environment is the intensity of the use of agri-chemical inputs such as pesticides and mineral fertilizers.



Spraying of pesticides in a field of crops.

Despite a substantial decline in cultivated areas in recent decades, the average quantity of pesticides used per cultivated hectare rose from 0.73 kg/active matter/ha to 1.33 kg/active matter/ha between 1978 and 1992, or a rise of 82% over 14 years. The use of mineral fertilizers also increased: there are reports of a consumption which rose from 125,000 to 500,000 tonnes per year since the 1950s. It is therefore not surprising to find these contaminants in the waterways criss-crossing the agricultural regions of Quebec, as well as in the underground water table.

Although very useful for monitoring general trends, the data on the total sales of agri-chemical products in Quebec do not allow us to specify the territorial distribution of their use. That is why the Bureau de la statistique du Québec (BSQ) undertook a large-scale survey with farmers all over Quebec, in search of a better understanding of the how each farming technique is used on the territory and to come up with specific numbers for five drainage basins in Quebec: the four basins targeted by the **Agriculture Component of SLV 2000 (Boyer, Chaudière, L'Assomption and Yamaska) as well as the Châteauguay River. Jointly commissioned by the Quebec Ministère de l'Environnement et de la Faune (MEF) and the Ministère de l'Agriculture, des Pêches et de l'Alimentation (MAPAQ), the survey also benefits from funds of SLV 2000.

"This is the first time a survey of this magnitude has been carried out in Quebec," underlines Marcel Gaucher, from the MEF. "The data gathered by Statistics Canada every five years from farm producers deal with many aspects of farm management. What is special with this survey is that it will delve much deeper into questions on pesticides and fertilizers. It will give us specific figures with regard to the 21 crops targeted by the Stratégie phytosanitaire du Québec (Pest Management Strategy)." Adopted in 1992 by the MAPAQ, this strategy, backed by the MEF and the Union des producteurs agricoles (UPA) aims at cutting in half the use of pesticides in agriculture by the year 2000.

Methodology

Conducted with a sample of 5,000 farm producers, the survey, which covers the 1995 growing season, was carried out in two parts: the first covers the period from April to June and the second, from July to October 1995. In this way, this compilation of data will allow us to better assess the situation, and better target the interventions.

The questionnaire sent to producers aims at gathering the most accurate estimations possible on six items:

- a general estimation of the number of farm operations using pesticides;
- a more detailed estimation of the pesticides used for each crop;
- an estimation of the number of farm operations using alternative methods in the control of undesirable pests;
- a general estimation of the number of farm operations that use mineral fertilizers and those that use farm fertilizers;
- a detailed estimation of the mineral fertilizers used, the major nutritive elements, the spreading periods and frequency and the extent of sub-contracting for the spreading of these fertilizers.

Quantity of Pesticides Applied on Major Quebec Crops

Crop	Surface Area (%)	Percentage of Farm Pesticides Used (%)
Maize	18.1	50.1
Apples	0.005	12.6
Cereals	17.7	9.8
Potatoes	0.009	8.9
Vegetables	0.014	5.1
Soya	0.017	4.7
Hay/pastures	57.5	2.1
Other crops	6.7	6.7

Source: MAPAQ, Info-Ressources, Vol. 2, Issue 4, 1995 (modified).

"The very nature of agricultural pollution leads us to use more sophisticated types of analysis tools if we want to be effective in our actions," explains Marcel Gaucher. "This survey is a first: it allows us to get a hold on things. This will likely lead to changes for subsequent surveys." The MAPAQ and the MEF estimate that the survey should be reconducted at least every five years or so in order to be able to accurately monitor the changing use of pesticides and fertilizers in Quebec. In the meantime, the annual compilations of total sales of fertilizers and pesticides remain useful to indicate general trends.

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diagnose the problems to be solved on their farms and adopt an action plan spelling out the priorities as well as the implementation stages of the new farming techniques.

"The massive information campaign currently under way in the drainage basins of the Boyer, L'Assomption, Chaudière and Yamaska rivers will also allow us to obtain a better grasp of the causes and effects of agricultural pollution and thus better target priority interventions that will lead to concrete results in the quality of water of these tributaries and, indirectly, of the River itself," explains Pierre Vallée.

"Given the current economic context, says Marcel Gaucher in closing, governments must focus their attention on measures that will translate into real environmental gains at the best cost possible, both for farmers who must face international competition and for society which must support these gains in the transition toward sustainable agriculture."

IN BRIEF

The St. Lawrence Beluga Recovery Plan

Prepared by a group of independent experts formed further to an agreement between the federal Department of Fisheries and Oceans (DFO) and the World Wildlife Fund (WWF), the *St. Lawrence Beluga Recovery Plan* was made public last February 14. The report proposes five strategies to help the beluga population grow over the coming years:

- Reduce the emissions of contaminants and address the problem of re-circulating toxic products accumulated in the sediment.
- Reduce the disturbance caused by the intensification of the river traffic in the area inhabited by belugas.
- Prevent ecological catastrophes.
- Implement a research and monitoring plan of the beluga population with a view to better understanding and directing its interventions.
- Investigate other obstacles that can hinder the beluga's recovery.

A few thousand strong at the end of the 19th century, the beluga population was decimated for several decades by excessive commercial and sport hunting. In 1992, the population numbered no more than 525. Even though hunting ceased in 1979, the recovery of stocks was not swift, because this species' rate of growth is relatively low. This slow rate is attributed in part to the pollution of the River, since beluga carcasses found in recent years are highly contaminated and contain exceptionally high levels of chemical substances.

The first of its kind to be produced in Canada for a cetacean, the Plan was remitted to the Beluga Committee of SLV 2000. It took close to two years to produce.

For information, call the World Wildlife Fund: (514) 866-7800; Maurice-Lamontagne Institute (418) 775-0526.

Le Fleuve on the Green Lane

Starting in this issue, a version in hypertext of the newsletter *Le Fleuve* can be consulted on the Internet site of Environment Canada: http://www.wul.qc.doe.ca/envcan/indexe.html.

RECENT PUBLICATIONS

Bilan régional, secteur du Saguenay, accompanied by three technical reports on (1) the physical and chemical aspects of the water and sediments in the Saguenay sector; (2) its biological communities; and (3) its socioeconomic aspects. The documents are available at the St. Lawrence Centre of Environment Canada, in French only, by calling (514) 283-7000.

Synthèse des connaissances sur les riques à la santé humaine reliés aux divers usages de la rivière Saguenay. A study conducted by J.-F. Duchesne, J.-M. Leclerc, J. Chartrand and D. Gauvin of the *Centre de santé publique de Québec* on behalf of the Health Component of St. Lawrence Vision 200. You may obtain a copy of the study, in French only, by calling (418) 666-7000.

Plan d'action pour le rétablissement du Râle jaune (Coturnicops noveboracensis) *au Québec,* by Michel Robert, Pierre Laporte and François Shaffer, Canadian Wildlife Service, St. Lawrence Vision 2000, December 1995. The document is available at the Communications Directorate, Environment Canada, Quebec Region, 1141, route de l'Église, C.P. 10,100, Sainte-Foy (Qc) G1V 4H5.

The St. Lawrence Beluga Recovery Plan, prepared by the St. Lawrence Beluga Recovery Team, made up of independent experts and co-chaired by Richard Bailey from the Department of Fisheries and Oceans (DFO) and Nathalie Zinger from the World Wildlife Fund (WWF). This document is available at the federal Department of Fisheries and Oceans, Maurice-Lamontagne Institute, Communications Directorate, 850, route de la Mer, C.P. 1,000, Mont-Joli (Qc) G5H 3Z4 or the World Wildlife Fund – Canada, 1253 McGill College Ave., Suite 446, Montreal, (Qc) H3B 2Y5.

Le parc marin du Saguenay–Saint-Laurent "Carrefour de vie, source d'échanges et de richesses", le plan directeur. A summary of the master plan is also available. You may obtain a copy of these documents by calling the MEF at 643-3127 and, for people living outside Québec City, at 1-800-561-1616, or by calling the Parc Marin du Saguenay–Saint-Laurent at (418) 235-4703.

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The Agri-Environmental Diagnoses of the Drainage Basins Studied by SLV 2000
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The Saint-Esprit Stream Project
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AGENDA

- **May 14 to 16, 1996**

  The third annual conference on the St. Lawrence Ecosystem, held at the Civic Complex in Cornwall, Ontario. For information, contact David Leech, tel: (613) 936-6620; fax: (613) 936-1803; e-mail: dleech@cnwligs.net.

- **September 1996**

  Tabling of the environmental assessment report of the Baie-Comeau sector under the ZIP Program.

- **September 30 to October 4, 1996**

  The *Septièmes entretiens Jacques-Cartier.* 1996 *River and Heritage Symposium* on the theme *Why Develop a River?* The symposium will be held in Québec City on September 30 and October 1, and in Montreal from October 1 to 4, 1996. For information, contact Martine Bugeaud: (418) 649-8228.

- **October 1996**

  A public consultation organized by the Baie-Comeau ZIP Committee, following the tabling of their report.

- **November 1996**

  A symposium on the St. Lawrence River, co-organized by St. Lawrence Vision 2000 and the *Association des biologistes du Québec*. More information contained in the upcoming issue.

LE FLEUVE

N E W S L E T T E R
St. Lawrence Vision 2000

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