LE FLEUVE

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IN TUNE

Pollution of the St. Lawrence and the health of newborn infants on the North Shore

Between 1993 and 1997, researchers conducted an environmental health study on the North Shore. They looked into links between the main health indicators for newborn infants and in utero transfer of various environmental pollutants and certain nutrients.

Recreational shellfish gathering on the North Shore of the St. Lawrence Estuary

Research by the North Shore Public Health Branch includes a survey of recreational shellfish gatherers and an assessment of the microbiological and chemical risks associated with shellfish consumption.

The Quebec City and Chaudière-Appalaches ZIP Committee

A study revealing public perceptions and expectations regarding activities and the planning of access and facilities on the shores of the river.

Pollution of the St. Lawrence and health of newborn infants on the North Shore

Photo : Claire Laliberté

Studies conducted several years ago by a research team from the CHUQ (Quebec City University Hospital) showed that fishermen on the Lower North Shore were more exposed to the pollutants in the St. Lawrence than was the population of southern Quebec. Since the risks to newborns were a concern, the team looked into the links between the main newborn health indicators and the transfer of certain environmental contaminants and certain nutrients during pregnancy. This article presents their main conclusions.

Between 1993 and 1997, the CHUQ Public Health Research Unit, in collaboration with the Sept Îles Regional Hospital, the Mingan Health Centre and the North Shore Public Health Branch, conducted an investigation of environmental health on the North Shore in order to:

- measure certain persistent environmental pollutants such as mercury, organochlorines (especially PCBs) and lead in newborn infants;
- determine the proportions in newborns of certain essential fatty acids, transferred from the mother after eating fish;
- check the link between concentrations of pollutants and of fatty acids at birth and various indicators of newborn health, including weight.

Some 540 mothers took part in the study, completing a lifestylel questionnaire while they were in hospital. After the birth of the child, some of the blood taken for routine sampling was set aside for laboratory analyses. Also, medical information on the health of mother and child was taken from hospital records.

SUMMARY

Canada

Saint-Laurent Vision 2000

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Photo : Gilles Falardeau

Mercury and organochlorines

Analysis of blood samples showed average mercury levels in newborns on the Middle and Lower North Shore to be higher than in Sept Îles or in the Province of Quebec as a whole, though lower than in Nunavik. However, none of the samples analysed showed mercury concentrations exceeding the health risk threshold set by the World Health Organization.

For the Middle and Lower North Shore, average overall levels for PCBs (selected as representative of organochlorine products) are about three times higher than in newborns in the Sept Îles area, but lower than in those from Nunavik. Nearly 93% of the samples analysed were within safe limits.

On the North Shore, there are practically no direct sources of mercury or organochlorines, but the wind carries these products vast distances from their points of origin. These pollutants also accumulate in the food chain and are thus found in varying concentrations in the fat and flesh of animals, including fish and the eggs of seabirds, so that people who rely on these food sources increase their bodies' contaminant load.

During pregnancy, these products are transferred across the placenta from mother to foetus. A number of scientific studies to determine whether exposure to such products may have adverse effects on the operation of the immune and endocrine systems and development of the nervous system are currently under way.

Lead

Sources of lead contamination abound; it is found in water, food, the soil and dust. It is feared that when contamination reaches a certain level in the tissues of children, learning may be affected.

Average lead concentrations for the Middle and Lower North Shore are between those recorded for Quebec as a whole and those for Nunavik. Concentrations are lowest in newborns in the Sept Îles area. All lead concentrations measured are within safe limits.

Omega-3 type essential fatty acids

Other products, as well as environmental pollutants, were measured in newborn infants: omega-3 type essential fatty acids, such as are found in the tissues of fish. These fatty acids help prevent cardio-vascular diseases in adults and certain developmental disorders in children. They also promote better foetal growth and tend to extend pregnancy, thus increasing the child's birth weight. Omega-3 type fatty acids are particularly abundant in fish of the cold seas.

Analysis results show that newborns on the Middle and Lower North Shore have three times the quantity of Omega-3 fatty acids as those in the rest of Quebec.

Reassuring conclusions

Although the newborn infants of the Middle and Lower North Shore have in their bodies levels of mercury and organochlorines (PCBs) that exceed the average for Quebec as a whole, there seem to be no associated adverse effects on foetal growth. Rather, the diet of North Shore residents, rich as it is in food from the sea, has significant benefits for the newborn, since a substantial intake of fatty acids during pregnancy helps prevent premature births. Moreover, birth weights on the Middle and Lower North Shore and in the Sept Îles area are higher than elsewhere in the province.

A fact worth noting is that over the course of the study the researchers detected a drop in mercury and lead levels in local newborns and an even more significant decline in PCBs. According to Dr Eric Dewailly, lead researcher on the study, the efforts that have been made to educate the public on the North Shore about the risks associated with eating seabird eggs may account for declining PCB levels, and he was pleased to see how in a mere five or six years lower consumption of seabird eggs has enabled the population of the North Shore to bring prenatal exposure to many contaminants down to acceptable levels.

Photo : Claire Lalberté

In spite of these positive results, the research team's further education efforts will need to focus on adoption of tighter preventive measures for PCB exposure in young women. Claire Laliberté, another member of the study team, said that PCBs are characterized by their dogged persistence in the organism. It is therefore not enough for women to abstain from eating seabird eggs once they are pregnant to minimize foetal exposure risks; young women have to be urged to desist entirely from eating these eggs so as to avoid accumulating PCBs in their bodies, which would then create exposure risks in subsequent pregnancies.

More intensive education is called for with certain groups where the declines seen in newborns are less marked. Dr Dewailly cited as an example Montagnais women, who are probably less responsive to the materials produced so far in French and English; it would therefore be a good idea to adapt published materials to suit the reality of the North Shore's Montagnais communities.

For information:

Claire Laliberté
Telephone: (418) 666-7000, local 292
Fax: (418) 666-2776
E-mail: claliberte@cspq.qc.ca

Éric Dewailly
Telephone: (418) 666-7000, local 222

Research Centre, CHUL Building

Fax: (418) 666-2776
E-mail: edewailly@cspq.qc.ca

Sources:

DEWAILLY, Éric, Claire LALIBERTÉ, Germain LEBEL, Pierre AYOTTE, Jean-Philippe WEBER and Bruce HOLUB. 1999. Évaluation de l'exposition prénatale aux organochlorés et aux métaux lourds et des concentrations en oméga-3 des populations de la Moyenne et de la Basse-Côte-Nord du Saint-Laurent (Evaluation of prenatal exposure to organochlorines and heavy metals and omega-3 concentrations in the population of the Middle and Lower North Shore of the Gulf of St. Lawrence), St. Lawrence Vision 2000, 87 p. + appendices.

LALIBERTÉ, Claire. 1999. Les nouveau-nés de la Côte-Nord. Une étude en santé environnementale (Newborn infants on the North Shore. An environmental health study), St. Lawrence Vision 2000, leaflet.

These documents can be obtained by calling Sylvie Bélanger at (418) 666-7000, local 217.

Recreational sellfish gathering on the North Shore of the St. Lawrence Estuary

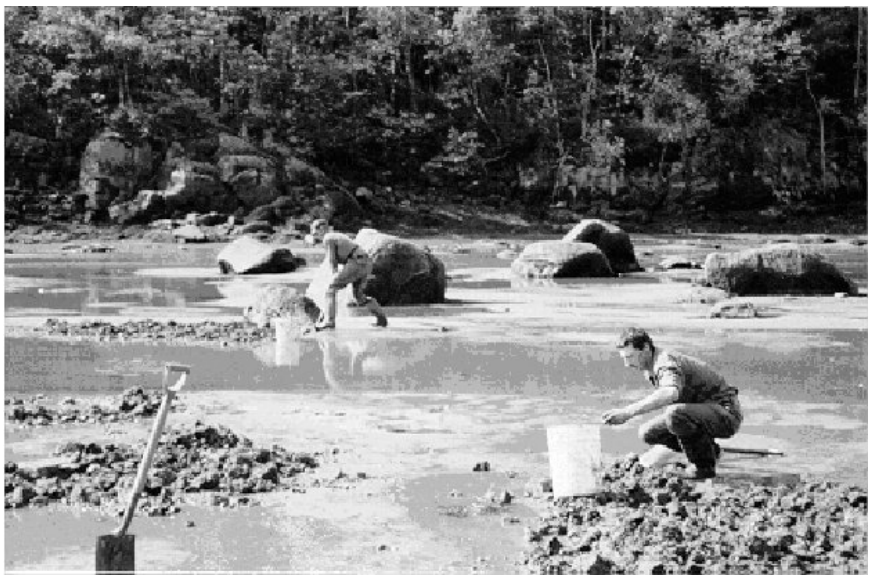

Photo : Thierry Tremblay

This article presents the conclusions of a study undertaken to document recreational shellfish gathering in the territory of the Area of Prime Concern (Zone d'intervention prioritaire, or ZIP in French) along the North Shore of the Estuary from Tadoussac to Pointe des Monts (village of Trinity Bay).

This research project was run by the North Shore Public Health Branch and included a survey of 200 recreational shellfish gatherers and an estimate of the microbiological and chemical risks associated with shellfish consumption.

Variable gathering and consumption patterns

The gatherers surveyed, mostly men between the ages of 20 and 50, can be divided into two categories on the basis of their gathering and consumption patterns; there are casual and regular gatherers (see Table 1).

The Softshell Clam is by far the species most widely harvested and eaten by the respondents, followed by the Waved Whelk and the Blue Mussel.

Risks and benefits to the health of consumers

The gatherers interviewed for the survey do not attribute any special benefit to a shellfish diet; they eat the organisms just because they like the taste. Yet there are many benefits associated with eating shellfish. They are excellent sources of iron and vitamin B12 and good sources of phosphorus, zinc and niacin.

Similarly, the respondents do not believe that eating shellfish poses any particular risk to their health, even though they know that gathering is prohibited in some harvesting areas. The reason for the ban is that the molluscs concentrate in their tissues certain pollutants found in the ambient water.

The research team assessed the potential microbiological and chemical health risks of eating the Softshell Clam, the bivalve most widely harvested and eaten along the north shore of the maritime estuary of the St. Lawrence. They wanted to determine whether, at the contamination levels measured in clams in the study area, consumption of this shellfish constitutes a substantial source of exposure to microbiological pathogens and chemical products introduced into the maritime estuary. Using the results of the analysis, health risks were assessed for various consumption patterns.

Photo : Thierry Tremblay

The photograph shows, left, the Common Soft-shell Clam; top and mid centre, the Blue Mussel; bottom centre, the Common Northern Buccinum, or Waved Whelk; top and mid right, the Arctic Wedge Clam, and bottom right, the Periwinkle.

Table 1 – Distinctive characteristics of shellfish gatherers

Causual	Regular
Gather shellfish less than three times a year	Gather shellfish several times a month
Gather shellfish mainly weekends	Gahter shellfish any day of the week
Gather shellfish only in spring	Gather shellfish mainly in spring but also at other times of the year
Eat shellfish less than five times a year	Eat shellfish more than eleven times a year
Eat shellfish at certain times of the year only, mainly in spring	Eat shellfish year-round or without favouring any particular season

Laboratory analysis of samples taken from various shellfish areas suggests that consumption of the Softshell Clam does constitute a substantial source of exposure to microbiological pathogens and chemical pollutants.

According to Jacques-François Cartier, one of the participating researchers, chemical contamination especially was detected in measurable concentrations for all nineteen pollutants under study, including PCBs and various heavy metals and organochlorines. At present, however, there is no testing for these substances when the quality of shellfish beds is being assayed. The team therefore recommends that a monitoring system be set up to measure these parameters, as well as toxins and contaminants of bacteriological origin, in areas where shellfish are harvested. This monitoring should be done on a regular basis so that any trends in concentrations of chemical pollutants will stand out.

In spite of the concentrations found, there is no reason to advise regular consumers to change their habits, as long as they follow cooking recommendations and stay away from closed areas. In conclusion, Mr Cartier said that the survey suggested the existence of a subsistence harvest, in addition to the casual and regular categories of gatherers. These consumers must be urged to reduce their consumption, but with due consideration for the trouble they will have in substituting another food source for the shellfish, the harvest being a response to a highly problematic local socio-economic context.

Sources:

TREMBLAY, Thierry, Jacques-François CARTIER and Fabien GAGNON. 1999. Analyse du risque chimique et microbiologique lié à la consommation de mollusques cueillis de façon artisanale dans la ZIP de Baie-Comeau (Analysis of the chemical and microbiological risks associated with consumption of recreationally harvested shellfish from the Baie Comeau Area of Prime Concern), Public Health Branch, North Shore Regional Health and Social Services Board, 150 pages + appendices.

For information:

Jacques-François Cartier
Health and Environmental Advisor
North Shore Regional Health and Social Services Board
Telephone: (418) 589-9845
Fax: (418) 589-8574
E-mail: Jacques-Francois_Cartier@ssss.gouv.qc.ca

Chronicle
ZIP Committees in the Heat of the Action

The Quebec City and Chaudière-Appalaches ZIP Committee

Learning More about the Public's Expectations To Better Respond to Them

This article reviews the highlights of a study conducted by the Quebec City and Chaudière-Appalaches ZIP Committee to identify public perceptions and expectations regarding activities practised and the planning of access points and facilities along the St Lawrence.

During public consultations held by the Quebec City and Chaudière-Appalaches ZIP Committee in March 1997, one of the priorities identified by participants was the need for a profile of the public's current satisfaction with and expectations regarding access to the St Lawrence and activities carried out along the river. As a result, the ZIP Committee undertook a study on the public's needs regarding uses of and access to the St Lawrence River, in co-operation with the Research, Investigation and Survey Department at Mérici College and several financial partners. One thousand one hundred and twenty-seven residents in riverside municipalities were surveyed between February 3 and 28, 1998; the study had a margin of error of 3% with a confidence coefficient of 95% (19 times out of 20).

"The respondents were asked about their knowledge and views of public access points to the river, the activities they carried out along the riverbanks, the facilities they would like and the role of public organizations in enhancing recreation and tourism along the St Lawrence," explained Ms Hamida Hassein-Bey, the Committee's co-ordinator. The study's conclusions were made public on June 1 at a press conference attended by 250 people (media representatives, citizens and socio-economic players in the region). The conference, held aboard the vessel Louis Jolliet, was followed by a cruise, courtesy of Croisières AML. Those who attended were given an opportunity to discover a portion of the Committee's territory, which extends from the Côte de Beaupré Regional County Municipality (MRC) to the Portneuf MRC on the north shore, including the Île d'Orléans MRC, and from the Bellechasse MRC to the Lotbinière MRC on the south shore.

Inadequate and Generally Poorly Known Access Points

One of the study's conclusions was that the individuals interviewed were dissatisfied with access points to the St Lawrence River. This question received the highest dissatisfaction rating in the study, with 36% of respondents saying they were somewhat or completely dissatisfied.

Fifteen per cent of the people interviewed were familiar with the Old Port in Quebec City, Beauport Bay and Jacques Cartier beach, but fewer than 5% of those questioned mentioned other points of access, such as Cap Rouge nautical park, Lévis wharf, the St Romuald marina, Gilmour beach and the Île d'Orléans marine park.

An Undeniable Interest in Activities Along the Riverbank

The activities that respondents were interested in carrying out if the riverbanks were developed and the water quality was sufficiently high were picnicking (91%), hiking (90%), cycling (82%), nature interpretation (81%), visiting interpretation centres and heritage sites (79%), swimming (70%), boating (66%) and fishing (50%). The facilities they wanted are consistent with these activities (bicycle paths, hiking trails, parks and beaches).

With regard to the roles of various players in recreational and tourism development, close to 90% of respondents agreed that municipalities, supported by other players, should enhance the potential of sites along the river more extensively.

On the Right Track with the Action Plan!

Quite obviously, a number of the projects listed in the ERAP will help meet the public's expectations. "We used the launch of this report to congratulate the City of Lévis and the Quebec Urban Community on their initiatives. They are planning to build multi-purpose paths along the shore," explained Ms Hassein-Bey.

"In light of the interest shown in swimming, the ZIP Committee is insisting on the need to build holding tanks to control sewer overflows during rainfall," continued Ms Hassein-Bey. "We know that this

would require a $150 million investment, which could mean $10-12 million per year over 15 years—not a large amount when you consider that it represents less than 1% of the annual gross domestic product of the Quebec City region, which is $28 billion. Our study showed that 89% of the population would like us to continue to inject public funds to decrease sources of pollution in the St Lawrence. This support from the community, combined with the need to make the investments to date in public access points to the St Lawrence cost effective, should help to convince decision-makers of the urgency of taking action in this matter," she concluded, pointing out that this is the only way that people will once again be able to swim in the St Lawrence River.

Quebec City and Chaudière-Appalaches ZIP Committee partners in this study:

Mérici College, Quebec Department of the Environment, Quebec Department of Transport, Quebec Regional Development Secretariat, the Quebec Port Corporation and Ultramar.

Information:

Hamida Hassein-Bey, Co-ordinator
Quebec City and Chaudière-Appalaches ZIP Committee
Telephone: (418) 522-8080
Fax: (418) 522-4664
E-mail: zipquebec@qbc.clic.net

Source:

COMITÉ ZIP DE QUÉBEC ET CHAUDI"RE-APPALACHES ET COLL"GE DE MÉRICI, 1999. Étude sur les besoins d'usages et d'accès au fleuve Saint-Laurent, Comité ZIP de Québec et Chaudière-Appalaches, Québec, 31 p. + annexes.

A copy of the report (available in French only), which contains a number of other relevant data for organizations in the region, can be obtained by contacting the Quebec City and Chaudière-Appalaches ZIP Committee. The cost is $12 for ZIP Committee members and $15 for non-members (plus $2 postage and handling).

Photo : H. Hassein-Bey

Public access is so important that local people are taking part in shoreline clean-up. ZIP participation in shoreline clean-up on June 12, 1999 at Ultramar Park; organized by the St Laurent Street Citizens Committee.

Photo : R. Royer

Educating the public is important. Stand run by the ZIP during the June 12, 1999 shoreline clean-up; organized on the South Shore by the St Laurent Street Citizens Committee.

News *in* BRiEF

Jean-Pierre Gauthier, Director General, Environment Canada, Quebec Region, is the 1999 winner of the Partnership Award given by the Association of Professional Executives of the Public Service of Canada. Mr Gauthier received his award from the hands of Deputy Prime Minister Herb Gray at an official ceremony in Ottawa in June in honour and recognition of his outstanding contribution in the field of partnership and horizontal management. Congratulations, Mr Gauthier!

Congratulations to the entire scientific project team working on pollutant mass balance in the St. Lawrence, recipients in June of one of the 1999 Awards of Excellence at a ceremony in the Canadian Museum of Civilization in Hull. The award acknowledges the efforts of these public servants, who have had a beneficial impact on the communities where they live and work. Through this project, undertaken as part of the St. Lawrence Vision 2000 agreement, the nine members of the scientific team broke new ground and helped achieve a better understanding of the nature of the river's contaminants, developing new sampling and analysis methods that have since been widely applied in other studies. Well done, all of you!

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Administration and coordination
Clément Dugas and *Raymonde Goupil*, Co-chairs Communications

Suzanne Bourget, Institutional Communications

Text
Gaétane Tardif, Environmental Consultant

Realization
Françoise Lapointe, Editor, SLV 2000

Translation from French to English
PWGSC–Translation Bureau

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