



INITIATIVES POUR L'AVENIR  
DES GRANDS FLEUVES  
INITIATIVES FOR THE FUTURE  
OF GREAT RIVERS

# Synopsis sheets

Rivers of the World

## SAINT LAWRENCE RIVER

# Saint Lawrence

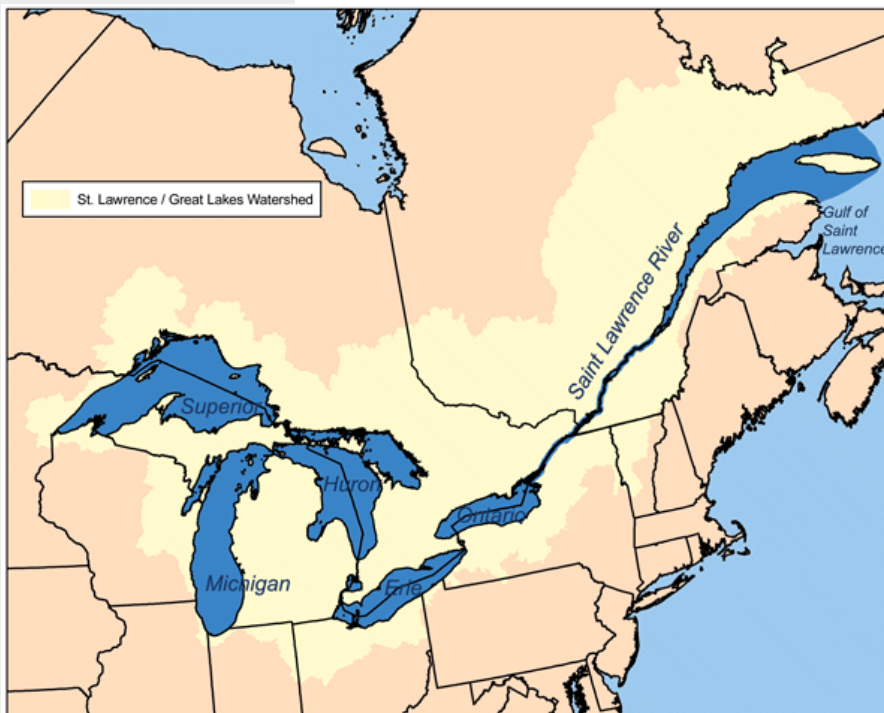
The source of Saint Lawrence River is at Kingston, at the outlet of Lake Ontario, from whence it flows for 1,197 km to the Gulf of Saint Lawrence after crossing the cities of Montreal and Quebec. The surface area covered by its watershed – 1.6 million km<sup>2</sup> - makes it the 3<sup>rd</sup> largest river system in North America, after the Mississippi and the Mackenzie. With the Great lakes (which belong to the same hydrological system) it represents 25% of the world's reserves of freshwater.

## A major point of entry into the continent

### *Its origins*

Known as the Hochelaga, meaning "the path that walks", by the region's Amerindian populations, the river was baptised with its current name after being discovered by Jacques Cartier in 1535. He claimed its possession on behalf of the King of France Francis I. It then served as the main route of navigation and discovery within the North American continent. The colonists settled on the sides of the river, by first founding the city of Quebec in 1608 and the city of Montreal in 1642. They then developed agricultural activities and fur trade.

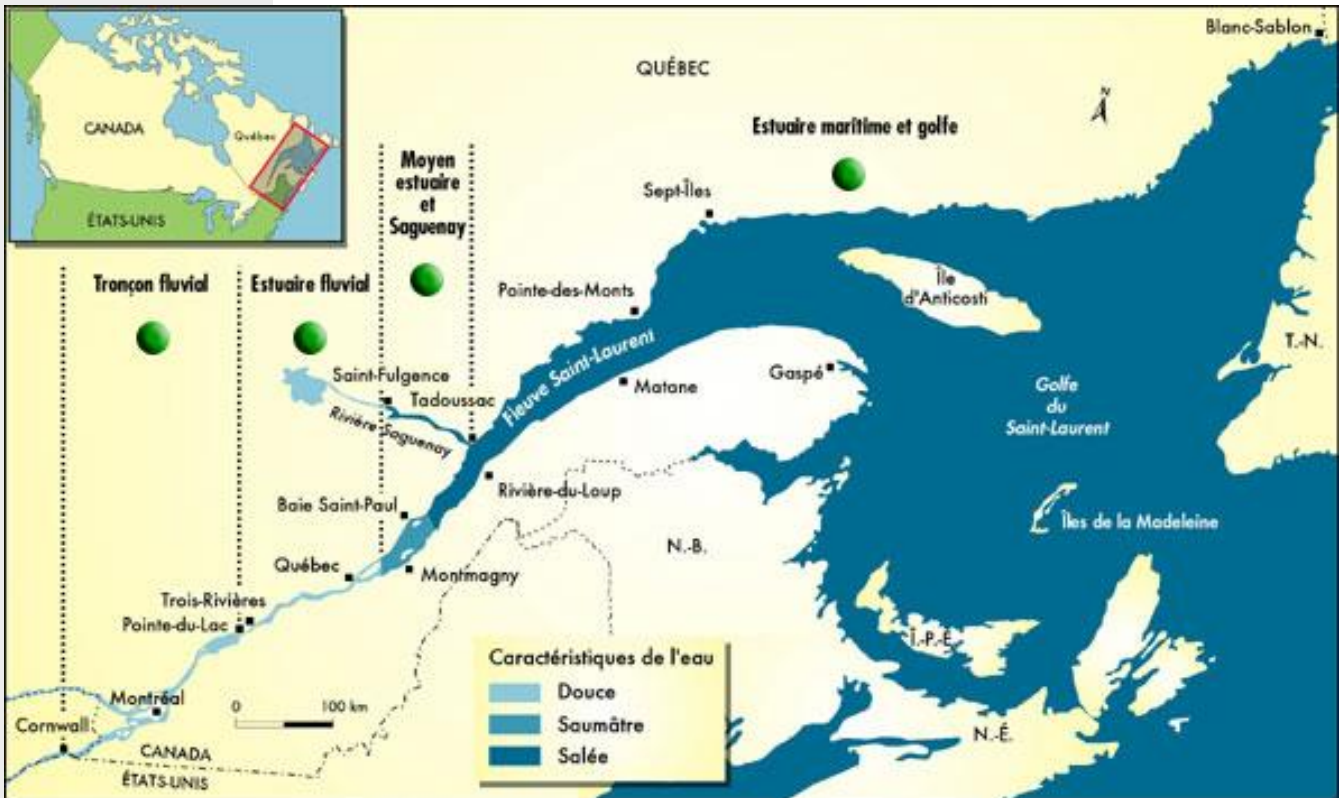
Its historic function of waterway has been developed up to the present by the construction of structures designed to bypass natural obstacles such as the Lachine rapids. This role must now take into account the development of new and sometimes contradictory uses: the transfer of water, hydroelectricity production and leisure activities.

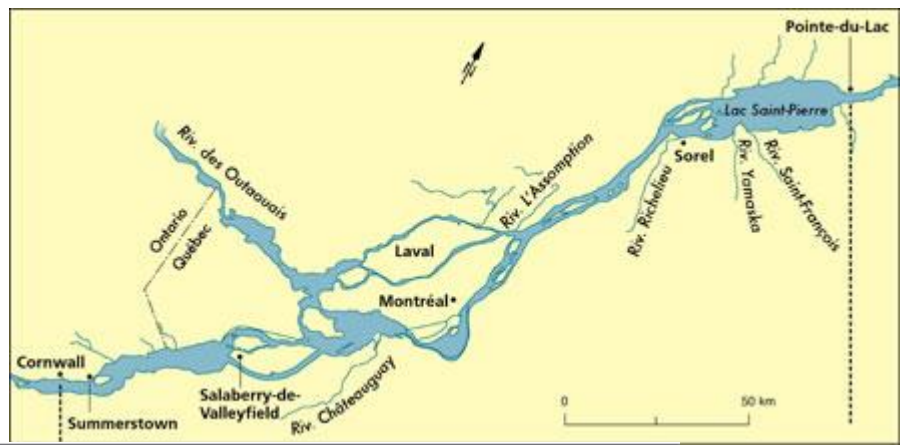


### *Technical data*

<u>Flowrate</u>	7,543 m <sup>3</sup> /s (Cornwall); 12,309 m <sup>3</sup> /s (Quebec)
<u>Length</u>	1 600 km
<u>Watershed</u>	1 600 000 km <sup>2</sup>
<u>Countries crossed</u>	United States, Canada
<u>Tributaries</u>	244 (main tributaries: Outaouais, Saguenay, Manicouagan, Saint-Maurice, Outardes rivers)

Section	Type of flow
River section (Kingston - Lake Saint-Pierre)	After the Ontario lake, the river is used as a border between Canada and the United States. It penetrates Canada in Kingston. The river then widens to create a series of lakes, either artificial (the Saint-Lawrence, created by the Cornwall dam) or natural (Saint-François and Saint-Louis lakes).
Estuary	Three sections: 1- Fluvial estuary or freshwater estuary (Lake Saint-Pierre – at the east point of Orleans Island). Tidal influence up to Trois-Rivières, freshwater from the Great Lakes. 2- Middle estuary or saltwater estuary (Orléans Island – mouth of the Saguenay and the west point of Green Island): where the saltwater and freshwater merge. 3- Maritime estuary (Tadoussac-Pointe-des-monts), also the starting point of the channel, a natural deep water canal with dense saltwater loaded with nutriments.
Golfe	The banks become more distant, up to 64km between Matane and Baie-Comeau! The river connects with the Ocean via the sides of the Terre-Neuve Island, in the Belle-Isle strait in the North, and with the Cabot strait in the South.





River section

Fluvial estuary



Middle estuary and Saguenay



Maritime estuary and gulf

## A multipurpose waterway

### **Navigation:** *the Saint Lawrence Seaway*

Previously, navigation on the Saint Lawrence River was impeded by natural obstacles, and blocked by the Lachine rapids at Montreal. The first structure intended for navigation was the **Lachine canal**, built in 1825, which removed the first obstacle to merchant shipping that developed rapidly following the dredging of the river between Quebec and Montreal from 1851 onwards.

The **Saint Lawrence Seaway** (completed in 1959 and co-conducted by Canada and the United States) has since replaced the Lachine Canal to link Montreal with Kingston and stretches to Lake Ontario. 306 km long, it comprises seven locks of which five are Canadian and two American. The **Welland Canal**, completed in 1932, then deepened in the 1950s in the framework of the Seaway project and straightened in 1973, stretches for 44 km and circumvents the Niagara Falls.

The season for the Saint Lawrence Seaway lasts from mid March to the second week of December (the closing day varies). More than 4,000 ships travel through it every year.

**The H<sub>2</sub>O Highway** is a 3,700 km long maritime route that includes the Great Lakes and the Saint Lawrence. It allows to connect to great industrial centres in the West of the US and Canada. It is an alliance of stakeholders in the transport sector devoted to the region's commercial development and innovative services. It includes more than 40 partner ports in the Great Lakes and along the Saint Lawrence.

### **TRAFFIC**

A total exceeding 100 m tons transits between the head of the lakes and the ports of the estuary (Baie Corneau, Port-Cartier, Sept-Îles), of which 38 m tons transit in the Seaway and 40 m tons in the Welland Canal. The traffic exceeds 200 millions tons when considering the entire network of the Great Lakes and the Saint Lawrence together.

Three quarters of the goods that transit via the Saint Lawrence are conveyed by international transport. The products entering Quebec through the Saint Lawrence mainly come from Europe, Central America, South America, Africa and the United States. As for exports, they are mainly shipped to Europe, followed by the United States and Asia-Oceania.

Crude oil is one of the main imports with more than 9 million tons unloaded annually in the port of Quebec and 13 million tons transshipped to the Port of Montreal. This oil mainly comes from Northern Europe and North Africa.

## A multipurpose waterway

### *The stakeholders of river transport*

The Seaway is the responsibility of the St. Lawrence Seaway Management Corporation (SLSMC). The management of non Canadian locks is performed in collaboration with its American counterpart, the St. Lawrence Seaway Development Corporation.

**St. Lawrence Seaway Management Corporation.** A non profit company, it has carried out the operational management of the Canadian sector of the Seaway (i.e. 13 of the 15 locks ) since 1998, previously the prerogative of the St. Lawrence Seaway Authority dating from 1954. The infrastructures and regulations remain under the authority of the Canadian government.

**Saint Lawrence Seaway Development Corporation (SLSDC):** Founded in 1954 by the Wiley-Dondero Act (or Seaway Act); it is a an American government controlled company that manages the Seaway between the port of Montreal and Lake Erie, within the territory of the United States. Its headquarters are in Washington DC.

#### **The Seaway in dates:**

- 1951: the law on the Administration of the Saint Lawrence Seaway was voted by the Canadian government.
- 1954: the Saint Lawrence Seaway Authority (Canada) and the Saint Lawrence Seaway Development Corporation (SLSDC, United States) were founded.
- 1959: the icebreaker D'Iberville made the first crossing of the Saint-Lawrence Seaway.
- 1966: the traffic control centre of the Welland Canal started service for the first time.
- 1986: the Water Resources Development Act was adopted by the American Congress.
- 1998: the St. Lawrence Seaway Management Corporation was founded (see further).
- 2003: an Automatic Ship Identification System was used for the first time in an inland waterway.

## The river structures

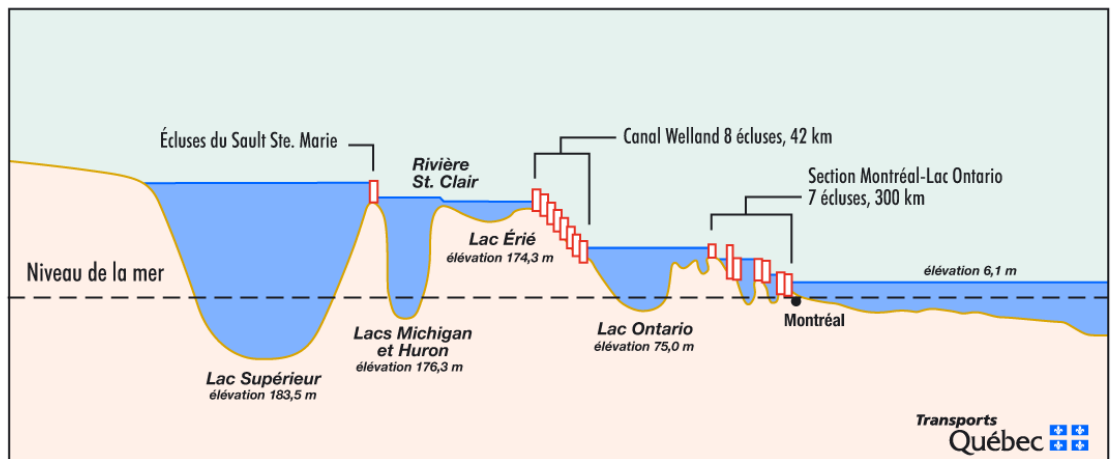
### The locks of the Saint Lawrence Seaway

The St. Lawrence Seaway starts at Saint-Lambert (upstream of Montreal) and stretches to Lake Erie. It is characterised by two networks of locks.

- An initial series of seven locks allows ships to cross the 300 kilometres that separate Montreal from Lake Ontario, via the South Shore Canal, the Beauharnois Canal, the Wiley- Dondero Canal and the Iroquois Canal.
- The Welland Canal comprises a series of eight locks in Canada. 44 kilometres long, it links Lake Ontario with Lake Erie. The locks lift the ships to over 100 metres.
- There are also two American locks at Sault Sainte-Marie that permit the passage of ships between Lakes Huron and Lake Superior.

Name of lock	Elevation of ships	location
Saint-Lambert lock	4.6 metres	Quebec
Côte Sainte-Catherine lock	9 metres	Quebec
Beauharnois locks (2)	12.5 metres	Quebec
Snell lock	13.7 metres	New York, USA
Eisenhower lock	11.6 metres	New York, USA
Iroquois lock	1.8 metre	Ontario
Welland canal (8)	99.5 metres	Ontario
Sault locks (2)	-	Michigan – Ontario border

## Profil de la voie maritime du Saint-Laurent



Service de la géomatique, octobre 2005

Source : Corporation de gestion de la voie maritime du Saint-Laurent

## The river structures

### The ports of the Saint Lawrence

National commercial ports	Tonnage handled in 2013 (in millions of tons)	Main activities and goods handled
Montreal (APC)	28.2	General goods (containers), petroleum products, cereals, minerals, excursion cruises and international passenger liners.
Quebec (APC*)	27	Petroleum products, cereals, minerals, metals, general goods, paper, excursion cruises and international passenger liners.
Sept-Îles (APC)	23	Iron ore, bauxite and alumina
Port-Cartier	18	Iron ore, cereals, wood chips
Baie-Comeau	5.6 (2008)	Cereals, alumina/aluminium, papier, wood, rail ferry, ferry
Trois-Rivières (APC)	3,3	Cereals, minerals, bulk solids and liquids, paper, oil, general goods, excursion cruises
Bécancour	2	Minerals, wood, steel, alumina
Port Saguenay (APC)	0.3	Minerals, bulk solids and liquids, paper, wood
Matane	0.253 (2008)	Paper, petroleum products, wood, de-icing salt, ferry, rail ferry
Gros-Cacouna	0.17 (2008)	Paper, wood
Gaspé	0.193 (2008)	Petroleum products, de-icing salt

Sources: Transports Canada, Pêches et Océans Canada, COGÉMA and port administrations

#### The port of Montreal

**Surface area:** 26 km long (Pont Victoria – Pointe-aux-Trembles) ± 1000 ha

**Only container port on the river:** 3 international container terminals and one being under construction in Contrecoeur, 40 km downstream of Montreal.

**Depth:** 11 m; average depth: 12.3 m

**Traffic:** 38 million tons of goods (2017) including 14 by container; and 1.5 million TEU containers with two main partner exchange zones : Asia (24% of the port's total international trades) and Mediterranean (21%); more than 2000 ships a year.

**Cruise:** 114 518 passengers and crew members in 2017.

**Governance:** Administration portuaire de Montréal (APM).

#### The Port of Quebec

**Surface area:** 220 ha, in the heart of the city of Quebec, including 20% dedicated to leisure and tourism activities.

**Depth:** 15 m

**Traffic:** about 25 million tons of goods (2016).

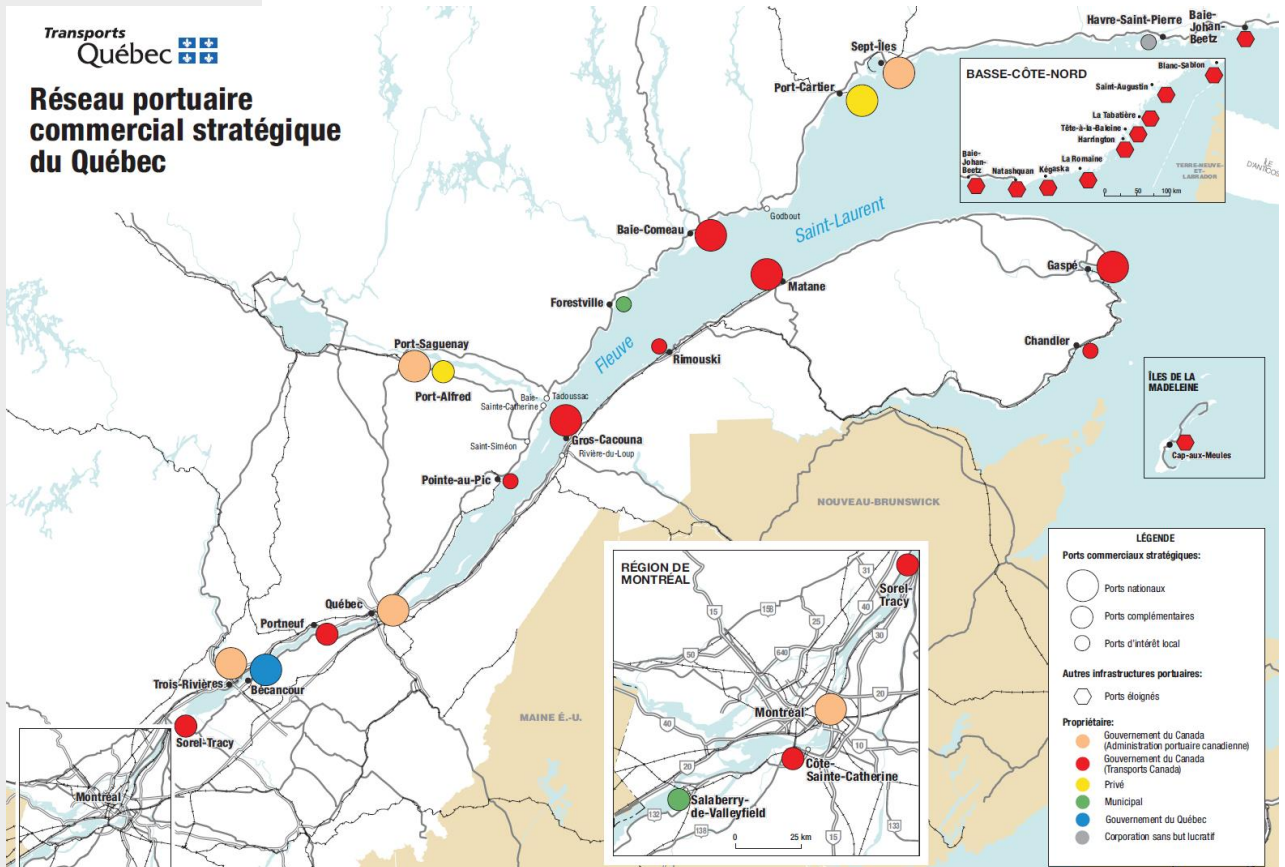
**Cruise:** more than 150 000 visitors in 2016

**Governance:** Administration portuaire de Québec (APQ); Federal agency founded by virtue of the Maritime law of Canada. Canada has 18 port administrations.



Transports  
Québec

## Réseau portuaire commercial stratégique du Québec



## Multiple uses

### *Hydroelectricity production*

Plentiful in Quebec, water quickly became the main source of electric energy. Large hydropower plants were built in the 1920s and 1930s, especially on the Saint Lawrence (Beauharnais plant) and its tributaries (Saguenay, Outaouais, etc.). Originally private initiatives, these plants were partly nationalised after **Hydro Quebec**, a public company, was founded in 1944.

However, from the 1950s the increasing impetus of this public company's large hydroelectricity projects involved the rivers in the north of Quebec more than the Saint-Lawrence. Contrary to the rivers of the north, its hydroelectric potential has not been exploited as much, for three main reasons:

- The nature of the river whose flowrates are difficult to exploit.
- Its historic use, dominated by navigation, especially since the Saint Lawrence Seaway was opened, which changed Montreal into a port of entry to the continent and made any project to build a dam impossible.
- Its population, much denser than in the very sparsely populated northern regions of Quebec, where little opposition exists. Projects for small hydropower plants in the country's southern rivers stir more protest than the projects for hydropower plants on the rivers of the north.

Despite its less significant role in hydroelectricity production, the Saint Lawrence is concerned by the challenges raised by hydroelectricity in Quebec which has become crucial for the country's economy, above all as a commodity for export: exports accounted for 30% of HQ's sales in 2002, versus 7.2% in 1991.

### *The actors of hydroelectricity*

**Hydro Québec** (the result of the nationalisation of Montreal Light, Heat and Power in 1944).

Wholly owned by the Quebec government, Hydro-Québec is the world's leading hydroelectricity producer. It is active throughout the entire chain, from production to distribution. It owns a total installed capacity of 36,634 MW (2014), which allows it to supply Quebec and to sell electricity on the wholesale markets of northeast America.

The hydroelectric development schemes include 62 hydropower plants and 27 large reservoirs with a storage capacity of 176 TWh, as well as 668 dams and 98 control structures.

Hydro-Québec also supports the development of other sectors such as wind power, and carries out research and development in the field of energy, including energy efficiency.

**Rio Tinto Alcan**: the largest private producer of hydroelectricity in Quebec. It owns seven hydropower plants on the rivers Saguenay and Péribonka.

**New York Power Authority**: A public electricity production company.

## Hydroelectric structures

### *Water regulation and hydroelectricity production structures*

Structures	Characteristics
Moses- Saunders	<p>location: Saint Laurent, near Cornwall            Construction: 1954 - 1958            Type: 2 plants, each located either side of the US/ Canadian border            IC: 1,952 MW            Annual production: NC            Actors: New York Power Authority and Ontario Power Generation</p>
La Grande-1	<p>Location: La Grande Rivière (37 km from the mouth and 80 km downstream of the Robert-Bourassa hydropower plant)            Construction: 1988 - 1995            Type: Run of the river plant            IC: 1,436 MW            Annual production: 7,900 GWh/yr            Actors:            Operator: Hydro-Québec            construction: Société d'énergie de la baie-James</p>
La Grande- 4	<p>Location: La Grande Rivière            Construction: 1984- 1986            Type: Reservoir            IC: 2,779 MW            Annual production: Not indicated            Actors: cf. La Grande-1</p>
La Grande- 3	<p>Location: La Grande Rivière            Construction: 1982- 1984            Type: Reservoir            IC: 2,417 MW            Annual production: Not indicated            Actors: cf. La Grande-1</p>
Robert-Bourassa (La Grande-2)	<p>Location: La Grande Rivière, near Radisson, east of James Bay, about 1,000 km from Montreal            Construction: 1979 - 1992            Type: 1 dam, 1 reservoir, 29 dikes, 1 spillway and 2 hydropower plants            IC: 5,616 MW            Annual production: 37 400 GWh/an            Actors:            Operator: Hydro-Québec            construction: Société d'énergie de la baie-James</p>
Manic- Outardes	<p>Location: rivers Manicouagan and Outardes            Construction: 1959 - 1978            Type: complexe comprising 7 plants            Total IC: 7,567 MW, including 1,596 for the Manic-5 plant and 1,244 for René-Lévesque            Annual production: Not indicated            Construction and operation: Hydro- Québec</p>
Beauharnois	<p>Location: Saint Lawrence basin, Lake Saint-François and the Beauharnois Canal            Construction: 1932-1961            Type: Run of the river plant            IC: 1,853 MW            Operator: Hydro-Québec</p>

Centrales  
de 300 MW  
et plus

- Centrale hydroélectrique
- ▲ Centrale thermique

Autres  
installations

- Centrale en construction
- ⊗ Centrale projetée
- Poste à 735 kV
- Ligne à 735 kV
- - - Ligne à 450 kV à courant continu
- ◄ Interconnexion
- Réseaux voisins schématisés



## The river structure

### **Tourism and recreational uses**

The Saint Lawrence attracts more than 2.5 million visitors and \$500 million for Quebec's economy. The regions of the maritime estuary and the gulf are grouped in an association called Québec Maritime, in order to better promote their drawing power for tourists. The Lower Saint-Lawrence also stakes on the river with its Navigators' Route which showcases the region's maritime heritage. Large centres such as Quebec and Montreal also offer several activities that allow visitors to make close contact with the river, for example, in the old ports and by taking excursions on cruise boats. Moreover, marine parks place the ecological value of the river to the fore, with sea dwelling mammals such as the beluga, the common whale and the blue whale.

The Saint Lawrence receives large volumes of wastewater discharged by wastewater treatment plants. Contaminated water is also discharged from rainwater drainage networks during storms. Lastly, not inconsiderable contamination comes from certain rivers. During the last 30 years, works have been performed on drainage systems in the 300 towns and cities (that is, 60% of the total Quebec population) that have nonetheless led to a considerable improvement in the quality of the river water. The largest of these works was the Quebec Wastewater Drainage Programme, which has consumed \$7 billion in investments since 1978. However, despite efforts made to treat wastewater, many potential leisure and recreational sites remain to be restored.

## Governance in international cooperation

### *United States - Canada: a model of international governance?*

In a context characterised by strong demand for water in certain regions of the United States, the reserves held by the hydrological network of the Great Lakes and the Saint Lawrence River have rapidly made international cooperation on water necessary, involving the two federal governments and ten States, notably to limit massive transfers of water to southwestern America.

#### Treaties and cooperation authorities

**1909: the Boundary Waters Treaty** (Washington Treaty, 1909), signed between the United States and Great Britain on behalf of Canada. It sets out the principles and management directives for cross border waters, including those of the Saint Lawrence. It covers general principles rather than detailed stipulations, aimed at preventing and solving disputes over the use of the waters shared by Canada and the United States, and at settling other cross border problems. The practical application of these principles is determined case by case. It forms the basis for the **International Joint Commission**, an independent binational organisation responsible for regulations, investigations and arbitration relating to the management of these waters.

**1985: the Great Lakes Charter:** signed by the governors of the neighbouring States and by the Prime Ministers of Quebec and Ontario, it provides for the implementation of a consultation procedure before any massive transfer project.

**2001:** A rider known as **Annex 2001** was added to the Great Lakes Charter. The ten Parties (the ten signatories) undertake to draft more restrictive measures to protect the waters of the basin of the Great Lakes and the Saint Lawrence River.

**2005:** the provisions of the Charter were strengthened by a more binding agreement: **Great Lakes—St. Lawrence River Basin Sustainable Water Resources Agreement.**

**2009:** A law asserting the collective nature of the water resources concerned intended to strengthen their protection. Its aims are to:

- Strengthen the foundations of collective and integrated governance regarding the hydrological unity of the Saint Lawrence watershed;
- Ensure the implementation of the Great Lakes—St. Lawrence River Basin Sustainable Water Resources Agreement.

Other international regulations:

**The Great Lakes Water Quality Agreement (GLWQA)**, an agreement between the governments of the United States and Canada on the quality of the water of the Great Lakes (2012), a major step in the creation of a system for collecting and sharing data on pollution between the two countries.

## Governance and international cooperation

### The governance bodies of the United States and Canada

#### 1- The IJC

##### *Missions*

- Manage the use of common waters
- Improve water quality
- Improve air quality
- Study problems and recommend solutions.

The IJC follows the directives of the **Boundary Waters Treaty** signed by Canada and the United States in 1909. The IJC also oversees the qualitative and quantitative preservation of the resource, and acts to conclude agreements between the two States:

- It produces reports on the Agreement relating to water quality in the Great Lakes, signed in 1978, committing the two States to eliminating the main sources of pollution of the Great Lakes and the Saint Lawrence River. It has also given rise to the United States-Canada Air Quality Agreement, through which the two countries are committed to significantly reducing pollutant emissions causing acid rain.
- It studies the pertinence of massive transfers of water from the Great lakes to the mid-western and western States of America. The final report published in 2000 underlines environmental risks and has served as the basis for legislation at national level tending towards prohibition.

##### *Tools on the scale of the Saint Lawrence basin*

**The International Saint Lawrence River Board of Control (ISLRBC)** was set up by the International Joint Commission by virtue of its order of approbation of 1952. The Board's main task is to ensure that the flowrates leaving Lake Ontario meet the requirements of the order. It also develops regularisation plans and carries out specific studies requested by the Commission.

The **Operational Advisory Group** is an operational body that makes recommendations for the ISLRBC on the discharge flows from Lake Ontario (POC, Seaway, NYPA, OPG, Hydro-Québec).

## Governance and international cooperation

### 2- The Great Lakes and Saint Lawrence River Basin Water Resources Regional Council

The Regional Council is the body responsible for implementing the Agreement on the sustainable water resources of the Great Lakes and Saint Lawrence river basin. It sets out the standards and common principles for managing withdrawals from the basin.

It comprises the governors of the Great Lakes, on the American side, and the Prime Ministers of the States of Ontario and Quebec, on the Canadian side.  
<http://www.glsregionalbody.org>

Its missions are to:

- Declare the conformity of the initiatives of the Parties aimed at implementing the Agreement on their territories;
- Carry out the regional examination of the projects submitted to it;
- Facilitate consensus and solve disputes;
- Periodically evaluate the cumulative impacts of water withdrawals;
- Draft reports on the application of the agreement.

### **Great Lakes—St. Lawrence River Basin Sustainable Water Resources Agreement**

This agreement originating from a initiative of federated States rather than from the Federal States, sets out the way in which the States and Provinces must manage and protect the Saint Lawrence Basin, and present a legal framework, promulgated within each State.

Objectives:

- act together to protect, conserve and restore the basin waters;
- facilitate collaborative approaches to the management of the basin waters;
- promote cooperation between the Parties;
- create a cooperation mechanism for water management;
- conserve the authority of the States and Provinces in the basin;
- facilitate exchanges of data, increase scientific information and enter into consultation on the potential effects of withdrawals and losses;
- prevent the major negative impacts of withdrawals and losses;
- promote an adaptive management approach to conserve the basin and manage its water resources.

In addition, in 2008 the American governors signed the **Great Lakes—St. Lawrence River Basin Water Resources Compact ("the Pact")**, an enforceable agreement between the eight States (not binding to Canada).

In particular, these agreements provide for:

- The formal banning of mass transfers outside the Great Lakes basin;
- Setting up a withdrawal management programme.

The provisions of the agreement can be found on:

<http://www.mddelcc.gouv.qc.ca/Eau/grandslacs/2005/index.htm>



## Governance and international cooperation

### 3- Other stakeholders

#### **The Council of Great Lakes Governors (1983)**

A pressure group founded in the United States by the States bordering the Great Lakes, notably due to the weakness of the IJC (which does not protect Lake Michigan, located exclusively on American territory). Quebec has been an associate member of the Council of Great Lakes Governors since 1997.

Subjects treated: water management, controlling invasive exotic species, maritime transport and the development of the economic area of Great Lakes and Saint Lawrence River Region.

#### **Watershed organisations**

- North American Network of Basin Organisations (NANBO), dating from 2006.
- Coalition of Quebec Watershed Organisations (ROBVQ). A non profit organisation founded in November 2001 and recognised by the Ministry of Sustainable Development, the Environment and Parks of Quebec as the principal agency for implementing integrated water management for the Quebec watershed.

Watershed Organisations (OBV): In Quebec, this organisation is formed by representatives of all the stakeholders in the water of the watershed (or sub-watersheds for the tributaries of the Saint Lawrence).

#### **The Great Lakes and Saint Lawrence Cities Initiative**

The Initiative campaigns to set up a transparent advisory mechanism in which neighbouring cities can involve themselves as full partners in the integrated management of the Saint Lawrence's water resources. The Initiative also campaigns for the application of compensatory measures for the municipalities affected.

## Governance and international cooperation

### *Governance on the scale of Canada*

**Saint-Lawrence Action Plan (SLAP):** launched in 1988 by the Canadian government, its purpose is to protect and restore the Saint Lawrence River through stronger collaboration between the Canadian and Quebec governments. It is also called the **Canada-Québec Agreement**, and its current version is SLAP 2011-2026.

The main elements of the SLAP 2011-2026 are:

- Carrying out joint actions in favour of biodiversity, water quality and uses;
- Decision aid tools: Numerical environmental forecasting and Monitoring the Condition of the Saint Lawrence River;
- Advisory and governance committees that are more participatory;
- Investments: Canadian government: \$49,143,700 / Quebec Government: \$20,887,400.

Advisory committees: The themes deal with issues demanding wide consensus, such as agriculture, climate change and navigation.

### **Stratégies Saint-Laurent (SSL):**

Stratégies Saint-Laurent is a non profit organisation, mostly financed by the Canadian government, which groups the priority action area committees of Quebec. Set up in 1989, Stratégies Saint-Laurent and the priority action area committees have been recognised since 1995 as major collaborators of Canada and Quebec in the framework of the Canada-Quebec Agreement on the Saint-Lawrence River (Saint-Lawrence Plan). It aims to gather the stakeholders involved by the preservation of the Saint Lawrence River: public administrations, municipalities, industries, environmentalists, interest groups, the community. They act by drawing up regional drainage plans (public consultation process) aimed at protecting, rehabilitating and enhancing the Saint Lawrence River. The governments collect and compile information for each section of the river.

**The priority action area committees:** There are 14 priority action area committees in Quebec that cover the entire river in 14 different areas. Non profit local organisations, they aim to obtain better knowledge of the environment of the Saint Lawrence River, through collaboration and action in relation with its different users. The priority action area committees draw up action and ecological rehabilitation plans (AERP). Each priority action area committee undertakes to be multidisciplinary and representative of a territory.

**L'Alliance Verte:** it's an environmental certification program for the Northern-American maritime industry founded in 2007; it aims at surpassing the regulations. It gathers more than 120 ship-owners, ports, sea route corporations, terminals and maritime construction works who commit to continuously improving their environmental footprint, year after year, in order to obtain the Alliance Verte certification. The uniqueness of this program is supported by environmental, academic and governmental actors. The program counts more than 60 collaborators who contribute to shape and revise this program.

## Governance and international cooperation

The basis of a new water governance approach for Quebec, the new **National Water Policy, voted in 2002**, stands on four main principles:

- Water management according to an ecosystemic approach in the framework of sustainable development;
- Improving the coherence of decisions and actions between all the stakeholders of water through better consultation;
- Using a watershed based approach;
- Action at different scales.

The Ministry of Sustainable Development, the Environment and Parks (MDDEP) was entrusted with the task of coordinating the integrated management of water by way of watershed organisations.

## What will tomorrow's river be like?

### *Developments, climate change and biodiversity*

In spite of many efforts and significant improvements over the last 20 years, industrial and agricultural pollution as well as discharges of untreated wastewater still have worrying impacts on the Saint Lawrence River. Accidental spills of chemical products and the introduction of invasive exotic species into habitats populated by naturally indigenous species represent additional threats that have to be taken into account

However, the main threat is climate change. The increase in temperatures leads to rises in the evaporation rates of the Great Lakes. This fall in water levels leads to equivalent reductions in water levels in the fluvial section of the Saint Lawrence, leading to many impacts on ecosystems and on maritime transport. More clement temperatures in winter cause the ice to melt along the coasts, so that the latter are no longer protected against severe winter storms. This has repercussions on the solidity of the banks which recede by several meters a year due to erosion. On a larger scale, the rise in the sea level due to melting ice caps could draw salt water further up the estuary, thereby affecting the drinking water of cities such as Quebec, located at the limit of the river estuary.

The erosion of the banks, the variations of water levels, the degradation of water quality and natural habitats also jeopardise certain leisure, commercial, industrial and public activities on the Saint Lawrence River.

### *Regulatory progress*

Stricter regulations and controls have obliged pollutant industries to treat their effluents and most municipalities are obliged to treat their wastewater. The maritime industry deploys a strategy of sustainable navigation and several shipping companies have set examples in the *Alliance Verte*, a programme initiated recently.

The **Saint Lawrence Action Plan** demonstrates the government's awareness of these issues. It defines three priority challenges for the river: the conservation of biodiversity, ensuring the perpetuation of uses, and improving water quality, and it includes commitments to meet them.

## What will tomorrow's river be like?

### *Integrated resource management: from agreements to their implementation*

Despite ever-growing stakes, especially regarding the environment, the different systems of governance now in place for the Saint Lawrence River appear to be progressing, as much regarding cooperation between levels of government (Canada/province of Quebec), as between the joint initiatives of infra-national stakeholders.

#### **Canada-Quebec: more integrated and participatory governance**

When the SLAP 2011-2026 was launched, the governments of Canada and Quebec undertook to develop cooperation around the Saint Lawrence River, particularly by setting up an annual forum on the Saint Lawrence (an arena of exchange and consultation) as well as regional round tables (RRT), aimed at establishing a durable forum for harmonising the actions of the different stakeholders involved by managing the resource and its uses. A regional integrated management plan (RIMP) must be developed. Under the aegis of the Regional Round Table, Priority Action Area Committees are entrusted, with the task of coordinating the development and drafting of the RIMP. A total of twelve RRTs will be set up progressively, corresponding to different regions of the Saint Lawrence basin.

The integrated management of the Saint-Lawrence is in the inception phase. The coming years will put to the test the different mechanisms and procedures devised, especially in the framework of the SLAP and the PAA.

#### **Infra-national governance focused on action**

The management of the waters between the 8 States bordering the river (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin), and the two Canadian Provinces (Ontario, Québec), made significant progress with the adoption of the agreement of 2005 "Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement", and the creation of the The Great Lakes and Saint Lawrence River Basin Water Resources Regional Council.

Actions have already been launched:

- The adoption of harmonised laws and regulations with the Agreement
- The creation of water conservation programmes
- The transmission to the Regional Council of data on withdrawals and the use of water in the part of the basin of each Party to the agreement
- The submission to the Regional Council of projects subject to joint review
- Regular reports submitted to the Regional Council.

Likewise, the agreement of 2012 relating to the quality of the water of the Great Lakes, signals a change with the announcement of clear commitments with deadlines for completion, more transparency, and greater participation by the population.

## What will tomorrow's river be like?

### *The end of major hydroelectric projects ?*

Although the Saint Lawrence is not the focus of major hydroelectricity projects, it is a strategic entry and exit point for imports and exports, notably oil, a sector for which the river attracts large infrastructure projects that stir heated opposition from environmental protection organisations. This is how, for instance, the project of a sea terminal in Cacouna, intended for the transport and storage of crude oil was dropped.