

THE DEVELOPMENT OF THE SAINT LAWRENCE SEAWAY

This is an inland water way partly artificially constructed from the Gulf of St. Lawrence to the Western end of Lake Superior. It covers a distance of 3,800 km. It was constructed jointly by the governments of the U.S.A. and Canada under the St. Lawrence Seaway project.

The main aim of the Seaway project was to create navigable waters in order to promote trade and development. Most of the construction works was carried out along the St. Lawrence River between the city of Montreal and Lake Ontario. The St. Lawrence River flows from Lake Ontario to the Gulf of St. Lawrence for 1,300 km.

The project cost an estimated US \$ 1.3 billion and employed 22,000 people at its peak. The project began in 1954 and was completed in 1959.

Problems of transportation had existed earlier on but it took long for the project to begin. The delay of the project was mainly because the U.S.A. was unwilling to cooperate and yet Canada did not have sufficient funds to carry out the work on her own.

Reasons why the St. Lawrence Seaway project delayed

1. Canada lacked adequate capital to start the work and yet the U.S.A. was unwilling to cooperate.
2. The U.S.A. was reluctant because she feared that her railways would lose market to the Seaway and be rendered redundant.
3. The U.S.A. opposed the idea also because she feared that the port of New York and the other Gulf or Atlantic ports would lose market since maritime traffic would be diverted to the Seaway.
4. The U.S.A. did not favour the project because she felt that small ships would still be able to sail in the region of the great lakes and the St. Lawrence River without the construction of the Seaway.

However some companies in the U.S.A. such as the United States Steel Industry (U.S.S.I) favoured the construction of the Seaway because it would obtain iron ore more cheaply from Labrador and areas to the West and south of Lake Superior.

In 1950 the U.S.A finally accepted to cooperate with Canada in the construction of the Seaway. Plans were then drawn and in 1954 the great engineering works began.

The U.S.A. finally agreed to cooperate because of the following reasons:

- a) By 1950 Canada had accumulated enough capital to start the work on her own. The U.S.A. realised that if Canada constructed the Seaway alone, she (Canada) would monopolise the dues/ tolls paid by the shipping Companies i.e. the U.S.A. wanted to have a share of the business.
- b) The U.S.A. also realised that if Canada was in total control of the Seaway, she (U.S.A.) would also be liable to pay charges for the use of the Seaway.
- c) The U.S.A. also realised that the construction of the Seaway would lead to the development of the iron and steel industries since these they would be able to obtain iron ore cheaply from the source areas.
- d) The U.S.A. also realised that there was need for socio-economic and political cooperation with her Northern neighbour i.e. for strategic reasons.

Obstacles to navigation before the construction of the seaway

1. **Rapids and cataracts:** especially between Montreal and Lake Ontario i.e. the Lachine rapids, Long Sault rapids and also between Lake Huron and Lake Superior i.e. around River St. Mary's i.e. the Sault Ste Marie rapids.
2. **Rock shoals/ small Islands/ shallow rocky areas:** Thousands of Islands section existed next to Lake Ontario along the St. Lawrence River. There were also shallow rocky areas around the same region. This acted as a bottleneck to shipping.
3. **Narrow sections in the river channel:** These sections also acted as a bottleneck to shipping.
4. **Waterfalls:** e.g. the Niagara Falls between Lake Ontario and Lake Erie. This was an obstacle to shipping.
5. **Freezing of the waters during winter:** especially in the Northern parts of Lake Huron and Lake Superior. This tended to lead to a halt in shipping.
6. **Occurrence of Fog:** This limited visibility creating the risk of accidents.

Aims of the St. Lawrence Seaway project

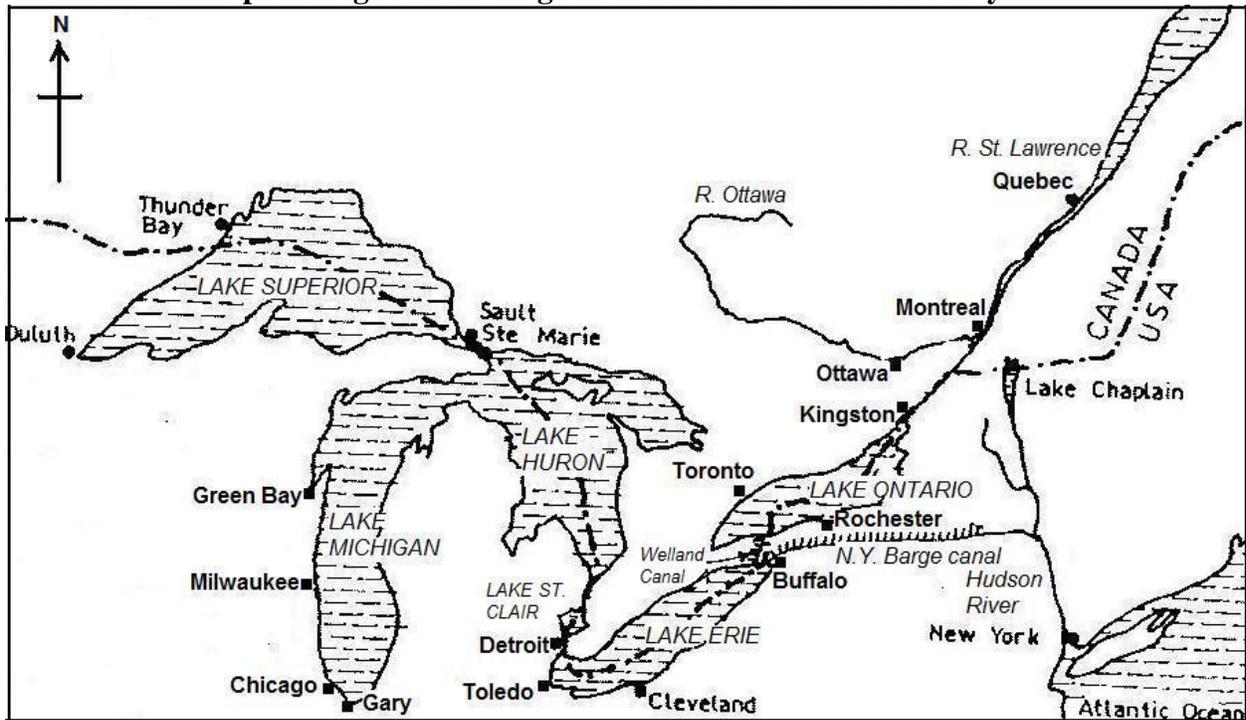
- a) To create deep and wide waters for navigation in order to promote economic activities.
- b) To generate Hydro electric power (HEP) through the construction of power dams.
- c) To control river floods.
- d) To ease transportation of bulky raw materials like wheat and iron ore.
- e) To link the interior of North America with the rest of the world.

The St. Lawrence Seaway project was therefore a multipurpose scheme or project. A multipurpose project is a planned activity carried out for several uses.

Activities carried out to overcome the obstacles during the Seaway project.

1. Blasting and dredging of rock shoals so as to deepen and widen the shallow rocky areas as well as the narrow channels.
2. The construction of canals to overcome rapids. Examples of canals constructed on the St. Lawrence River include Cornwall canal, Montreal canal, Beauharnois canal and Wiley-Dondero canal. Other canals constructed include Welland canal and Sault Saint Marie canal.
3. The construction of dams with locks to control water levels in order to facilitate shipping from one height level to another e.g. Iroquois dam, Beauharnois dam and the Mosses-Saunders dam (Barnhart dam) were constructed on River St. Lawrence to provide or generate HEP as well.
4. The problem caused by the freezing of the waters was overcome by the use of ice-breakers.

Sketch map of the great lakes region and the St. Lawrence Seaway



Locks:

Locks are a series of gates designed to allow a boat or ship to pass from one level of water to another. Locks were constructed at the dams to enable navigation or the sailing of ships from one height level to another. Locks have sluices which are opened to allow in water or closed to enable water to accumulate so as to raise the water levels to enable shipping. In most of the areas where locks have been constructed, efforts have been made to twin or double them to enable two-way traffic to avoid delays.

Series of diagrams showing movement of a ship through a lock up stream

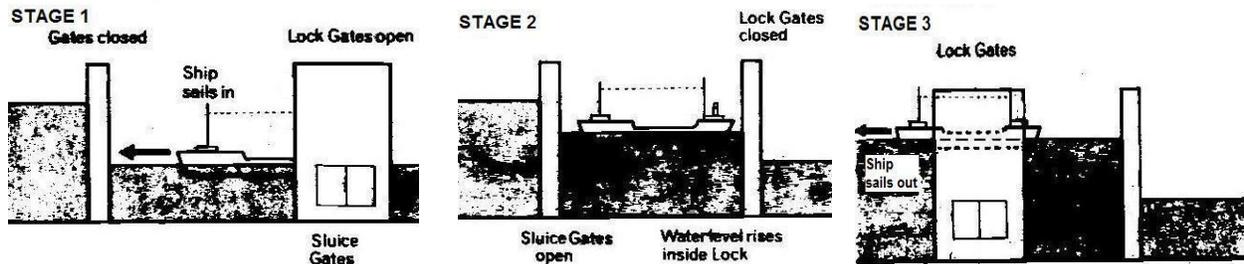
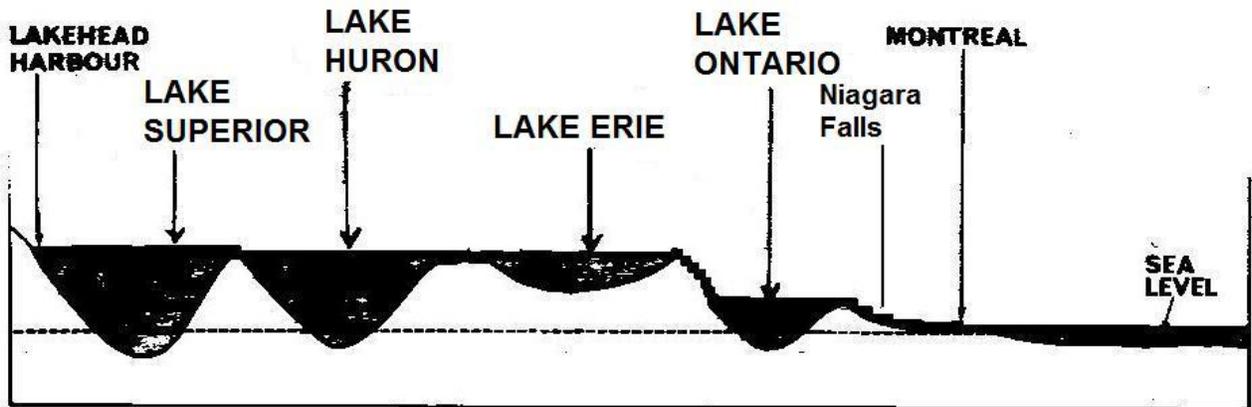
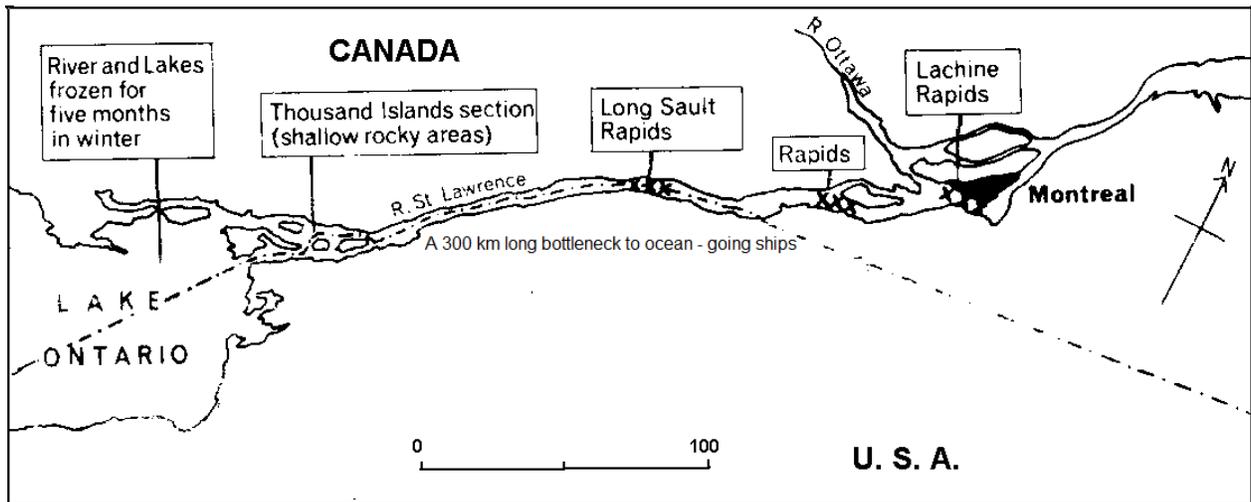


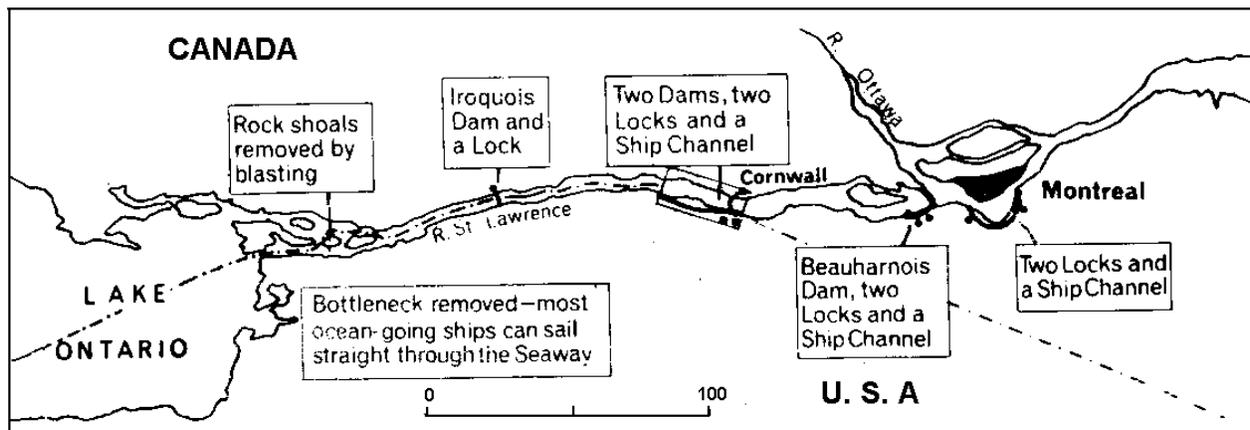
Diagram showing a section along the great lakes region from Lake Superior to St. Lawrence River



A Sketch map the St. Lawrence River section between Lake Ontario and Montreal before the construction of the St Lawrence Seaway



A Sketch map the St. Lawrence River section between Lake Ontario and Montreal after the construction of the St Lawrence Seaway



Niagara Falls.

The Niagara falls lie between Lake Erie and Lake Ontario along the Niagara River. River Niagara which connects the 2 lakes is about 50km long.

The Niagara falls pass through a narrow gorge with foaming rapids. The river falls almost 100m. The gorge was formed as the waterfalls plunged over resistant dolomite limestone. However the waterfall is gradually wearing away the dolomite limestone at a rate of about 1 metre a year.

The Niagara Falls is an important tourist attraction. It attracts over 2,000,000 visitors a year. Steps have been taken to reduce on the erosion on the gorge through which the waterfall passes. There are 2 falls i.e. the horse-shoe falls and the American falls. The two falls are separated by an island known as Goat Island. The horse-shoe falls are in the Canadian side while the American falls are in the USA.

Hydro-electric power production

The greatest concentration of the developed H.E.P. in the world is around the Niagara Falls. The generating plants altogether produce more than 4,000 megawatts of power. In the production of H.E.P, running water is used to turn the turbines that drive the generators to produce electricity. The power has been used for various agricultural, industrial and domestic purposes.

Welland Canal

The Welland canal connects Lake Erie to Lake Ontario. It was constructed to overcome the Niagara Falls as a hindrance to navigation. The original canal was built in the 1860's and improvements made several times until 1932 when a modern ship canal was constructed. As part of the St. Lawrence Seaway project, further improvements were made on the Welland canal and these included the following:

- a) It was deepened by dredging to a minimum depth of 8.2 metres
- b) It was widened to enable larger vessels to sail through.
- c) The existing locks were doubled (twined) to enable two-way traffic to avoid delays.

Sault Ste Marie canal (Soo canal)

The canal bypasses a stretch of rapids on the St. Mary's river between Lake Superior and Lake Huron. The Sault Ste Marie canal was constructed to link Lake Huron to Lake Superior overcoming the Sault Ste Marie rapids. This canal however has a restricted period or season because of winter freezing. When opened, the Soo canal still manages to handle more traffic than the Suez and Panama canals combined.

Benefits of the St. Lawrence Seaway project

- i. Deep and wide waterways have been created thus promoting navigation i.e. shipping has been made easier and safer.
- ii. Floods have been controlled by the construction of dams.
- iii. H.E.P. has been generated for industrial, agricultural and domestic purposes.
- iv. Trade with the rest of the world has been promoted.
- v. It has promoted the exploitation of minerals in and around the Great Lakes region.
- vi. It has led to the growth of towns into large cities and ports i.e. it has promoted urbanisation.
- vii. Agriculture has developed in the region. This is because of the improved/ easy transport.
- viii. The resultant industries and facilities of the seaway have provided employment opportunities to the people i.e. people have been able to get jobs.
- ix. Revenue from the tolls paid by the shipping companies has been obtained.
- x. The seaway has acted as a tourist attraction thereby bringing in income.

Products transported by the seaway

1. **Agricultural products:**
These include wheat, beef, dairy products, fruits, corn, barley, soya beans, tobacco etc.
2. **Minerals:**
These include iron ore, asbestos, copper, cobalt, petroleum etc.
3. **Manufactured products:**
Such as machinery, vehicles, household equipment etc.
4. **Forestry products:**
Such as timber, lumber, ply wood, wood pulp, furniture, chipboard etc.

Problems created by the seaway

1. Manmade Lake St. Lawrence flooded large areas, villages, towns and over 50km of Canadian highway and national railway lines.
2. It was a drain on the economy of the two countries since the construction was very expensive.
3. It led to the destruction of the natural environment or the eco-system.

Problems of shipping on the St. Lawrence Seaway

- a) Large Ocean going fleet like freighters (bulk carriers) and Super tankers still find the Seaway quite narrow. This has led to diversion of such vessels to other ports instead.
- b) Freezing of the waters during winter especially on the Soo Canal and parts of Lake Superior and Lake Huron.
- c) There are delays at some locks especially where there is still one-way traffic at a time.
- d) The occurrence of fog that reduces visibility creating the risk of maritime accidents.