

important of which are the St. Lawrence River, the Ottawa River, the St. Maurice River and the Saguenay River. The height of land in Canada at the northern limit of this drainage area averages about 1,800 ft. above sea level.

The St. Lawrence-Great Lakes waterway overcomes a difference of 600 ft. in five steps to provide navigation for through shipping. (1) From the sea to Montreal—the portion that lies wholly in Canadian territory and in which there is a rise of 20 ft. (2) The St. Lawrence River section—including the Lachine section, the Soulanges and Lake St. Francis section and the International Rapids section where the rise is 225 ft. (3) Niagara Falls—separating Lake Ontario from Lake Erie and having a rise of 326 ft. (4) The Detroit-Lake St. Clair passage—joining Lake Erie and Lake Huron where there is a rise of 8 ft. (5) St. Mary's Falls—lying between Lake Huron and Lake Superior where there is a rise of 21 ft.

For navigation, Canada has spent \$300,000,000 to provide a dredged channel of 35 ft. to Montreal; a 14-ft. canal system between Montreal and Lake Ontario; a 25-ft. canal between Lake Ontario and Lake Erie; and a lock at Sault Ste. Marie. The United States has provided locks at the Sault and dredged channels between Lake Huron and Lake Erie. Canada has developed her facilities to enable wheat from the Prairies to move from the head of the Lakes by water to the sea and thus, to provide an alternate route to European markets to that via the United States through the Erie Canal and the Hudson River to New York city.

The development of the St. Lawrence as a highway of international trade has involved a series of engineering projects in keeping with the increasing demands of traffic and the safety of larger and faster ships. Originally, the Gulf of St. Lawrence as far as Quebec was navigable for the largest ships afloat but sections of the route between Quebec and Montreal were restricted by a natural depth of 10½ ft. at low water. Early operations consisted of the removal of this and other natural barriers, thus linking up the deeper sections of the river. Dredging operations between Quebec and Montreal began in 1844 and have continued through the years since then. The present ship channel above Quebec has a limiting depth of 35 ft. at extreme low water.

Lachine Canal.—Above Montreal the Lachine Rapids constitute the first barrier to upbound navigation. Early in the 18th century the Sulpician Order, under Dollier de Casson, attempted the construction of a canal to by-pass these rapids but, through lack of funds, the project was never completed. Construction of the first canal, lying along the same route, was begun in 1821 and was opened in 1825; it had seven locks and accommodated vessels of five-foot draught. The commercial growth of the country necessitated enlarging the canal and work was commenced in 1843 which, when completed in 1848, provided 16-ft. draught at two lower locks and 9-ft. throughout the remainder of the canal. In 1874, further enlargement of the canal began and, in 1885, the present canal was completed, having five locks 270 ft. by 45 ft., with a minimum depth at normal low water of 14 ft. The canal is 8.74 miles long, extending from the Port of Montreal to Lake St. Louis at the city of Lachine, and overcomes a drop of 46.24 ft. in the level of the river.

Beauharnois Canal.—Before the Beauharnois Canal was built to provide navigation between Lake St. Louis and Lake St. Francis, navigation was effected by means of four short canals built by the Royal Engineers during the latter part of the 18th century and designed for the passage of boats capable of carrying 30 bbl. of flour. Between the years 1800 and 1805 the two lower canals were superseded by the