

St Marys River

The St. Marys River flows out of the southeast corner of Lake Superior in a southeasterly direction to Lake Huron, a total distance of 61, 63, or 75 miles depending on the route traversed. The fall between the lakes averages about 22 feet. The river consists of an upper reach and a lower reach. The upper reach begins in the lower end of Whitefish Bay on Lake Superior, about Pte. Aux Chenes, and extends approximately 15 miles to the St. Marys Rapids. This reach is broad and deep and falls about $\frac{1}{4}$ foot. Widths vary between 25,000 feet at the mouth of the river, to about 2,000 feet at Brush Point, the narrowest point above the rapids. Natural depths average about 20 feet.

Most of the fall in the river occurs in the area of the St. Marys Rapids. A rock ledge at the head of the St. Marys Rapids was the natural control of the St. Marys River. The river falls approximately 20 feet over this 1-1/2 mile reach. This area of the river has seen significant modifications including the construction of two bridges, construction of five navigation locks, construction of three hydropower plants and the 16-gated Compensating Works structure.

The lower river runs from the foot of the St. Marys Rapids to Point Detour on Lake Huron, a distance of about 45 miles. About 2-1/2 miles below the rapids, the river divides into two channels, one passing to the north end, the other to the west of Sugar Island. The flow in the northerly channel continues into Lake George and thence north of St. Joseph Island into North Channel, Lake Huron. The flow west of Sugar Island passes around Neebish Island into Lake Munuscong past St. Joseph Island and into Lake Huron. The fall in the lower river averages about 1-1/4 feet.

The first U.S. ship canal in the St. Marys River was constructed on the south side of the rapids in 1855 by the State of Michigan. The U.S. Government in 1871 started enlargement of the canal, which officially became federal property in 1881. Improvements of the U.S. navigation canal continued until September 1919 when there were four locks in operation. In September 1895 the lock in the Canadian navigation canal on the north side of the rapids was put into operation.

Two bridges cross the St. Marys River between Sault Ste. Marie Michigan and Ontario. These bridges have piers in the water which constrict the cross sectional area of the river, thus impacting flow. The International Railway Bridge construction was completed in 1888.

The first utilization of St. Marys River water for power production began in 1822-23, when a raceway and saw mill was built by the U.S. Army at Sault Ste. Marie,

Michigan. The first hydroelectric power plant was built on the United States side of the rapids by the Edison Sault Light and Power Company and was completed in 1888. This plant was later taken over by the Chandler-Dunbar Water Power Company, and is now known as the U.S. Government Plant. On the Canadian side of the Rapids, in 1889 the Ontario Water, Light and Power Company began excavation of a powerhouse headrace. This canal was completed, in 1895, by the Lake Superior Power Company. In 1887, the St. Marys Falls Water Company began excavation for a canal through Sault Ste. Marie, Michigan. This company encountered financial trouble and the development was completed by the Michigan Lake Superior Company. In 1903, the first water was diverted through this canal, now the Edison Sault Power Canal. In the spring of 1979, the Great Lakes Power Limited (Canada) began construction of a new powerhouse to replace the old Lake Superior Power Company plant. The new plant was fully operational early in 1983.

Due to the development of hydropower on the St. Marys River in the early 1900s, the International Joint Commission (IJC) authorized the construction of Compensating Works in the St. Marys River at Sault Ste. Marie Michigan and Ontario. The Compensating Works is a structure consisting of 16 gates, with gates 1-8 being in Canada and gates 9-16 being in the United States. Canadian gates 1-4 were constructed between 1901 and 1911. U.S. gates 9-16 were constructed between 1914 and 1917. Canadian gates 5-8 were constructed between 1918 and 1921. Beginning on August 13, 1921, full control of the flow in the St. Marys Rapids had been achieved. Since 1916, the outflow from Lake Superior has been controlled as directed in the International Joint Commissions 1914 Orders of Approval. The Commission established the International Lake Superior Board of Control to ensure compliance with the provisions of the Orders. Since June 1981, Plan 1977-A has been the operational regulation plan controlling Lake Superior outflows.

Dredging throughout the entire length of the St. Marys River, to widen and deepen navigation channels and to remove shoals and obstructions, has been ongoing almost continuously since the 1850s. In 1857, dredging of a 300-foot wide, 12-foot deep channel through the west channel of Lake George Flats was begun by the United States. Dredging in this channel was abandoned the next year in favor of the Middle Channel. Also around this time, excavation was being done in the East Neebish Rapids area by the Canadian Government. By 1870, when dredging in the Lake George Channel ended, due to lack of funds, the Middle Channel had been excavated to a depth of 14 feet and a minimum width of 150 feet. Dredging operations in the East Neebish Rapids were suspended in 1881.

In the 1880s and 1890s, dredging of the Middle Neebish Channel and the Little Rapids Channel provided channels with navigable depths of 20 feet and minimum widths of 300 feet. In 1893, to compensate for the increased cross sectional area, which resulted from the dredging of the navigation channel, compensating dikes were built: one was between Sugar Island and Island No. 1, at the head of Little Rapids Channel and the other was in the Middle Neebish Channel, projecting from Sugar Island. When the initial improvements of these channels were completed, the Lake George Channel was abandoned for commercial navigation. Dredging continued into the early 1900s, to improve and maintain the navigation channels of the St. Marys River to a minimum depth of 20 feet. Between 1902 and 1909, to cut wider channels, excavations were done in two reaches of the river. Little Rapids Cut was completed in 1907. The channel had a minimum width of 600 feet and was dredged to a depth of 21 feet. Rock Cut, in the West Neebish Channel, completed in 1909, was excavated to a width of 300 feet for a distance of 13,300 feet and had a depth of 22 feet. In 1932, dredging commenced to deepen certain reaches in the navigation channels to at least 25 feet. By the mid-1960s, all of the major navigation channels of the St. Marys River were being maintained at a minimum depth of 27 feet below chart datum (low water datum). Removal of shoals in the channels and canal approaches is an on-going project.

Ice conditions in the St. Marys River may be divided into three different stages. The fall freeze-up stage extends from mid-December to mid-January. This period prevails up to the time the main part of the river is covered with a solid ice sheet. An ice bridge may form above the Compensating Works which prevents additional ice from entering the rapids. The maximum winter flow in the rapids is 55,000 cubic feet per second, as set by the current regulation plan. This results in a gate setting of ½ gate open being maintained from December to April of each year. The period from mid-January to mid-March is the deep winter period and ice conditions generally remain stable over much of the upper and lower river. The spring break-up period generally extends from mid-March to mid-April. Large quantities of ice can pass through the Compensating Works and the rapids due to warmer temperatures and westerly winds.



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Most of the fall in the river occurs in the area of the St. Marys Rapids. A rock ledge at the head of the St. Marys Rapids was the natural control of the St. Marys River. The river falls approximately 20 feet over this 1-1/2 mile reach. This area of the river has seen significant modifications including the construction of two bridges, construction of five navigation locks, construction of three hydropower plants and the 16-gated Compensating Works structure.

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