

LAKE MANITOBA LAKE ST. MARTIN

OUTLET CHANNELS PROJECT

Updated February 2022

Design Update for the Outlet Channels Project

The Lake Manitoba and Lake St. Martin Outlet Channels Project is being constructed to provide flood protection benefits for Lake Manitoba and Lake St. Martin. It includes two new channels, one of which increases the outflow from Lake Manitoba into Lake St. Martin, and the other which increases the outflow from Lake St. Martin to Lake Winnipeg.

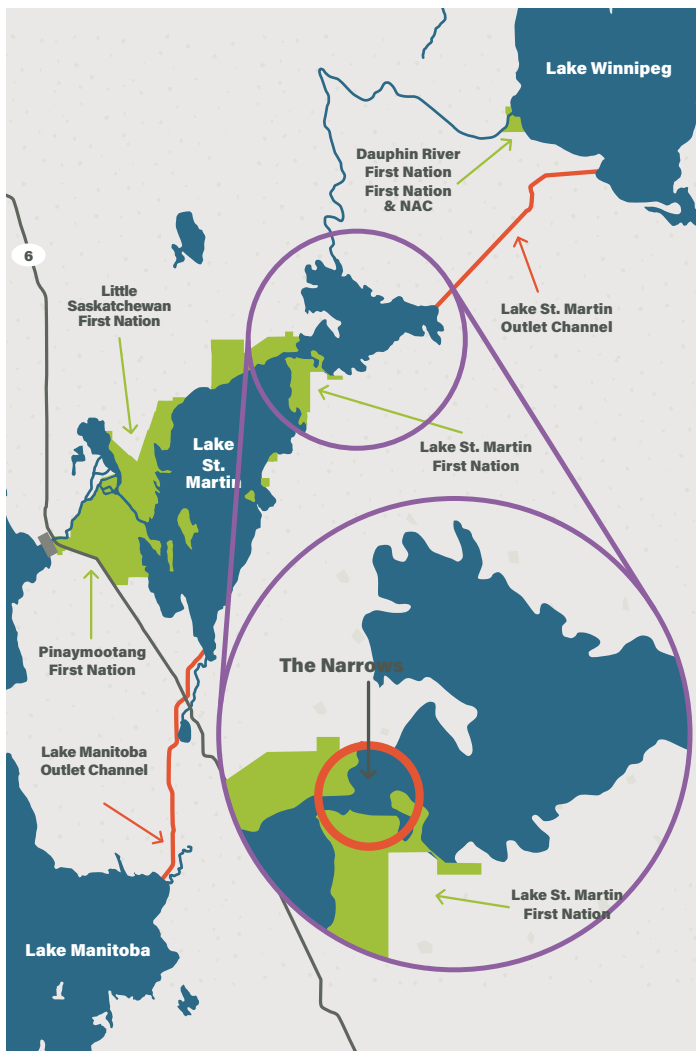


Figure 1: Lake St. Martin and The Narrows

Design Changes to the Lake Manitoba and Lake St. Martin Outlet Channels

During the detail design phase, updates were made to the Lake Manitoba Outlet Channel and Lake St. Martin Outlet Channels. The entirety of the wetted area for both channels will be lined with rocks (known as armouring) to help reduce the effects of erosion at higher water flows.

Design Changes to the Lake St. Martin Outlet Channel

Lake St. Martin is located between Lake Manitoba and Lake Winnipeg and is comprised of two basins separated by The Narrows at Lake St. Martin First Nation. All flows from Lake Manitoba to Lake Winnipeg pass through Lake St. Martin (see Figure 1).

Flood protection is focused on the south side of Lake St. Martin where the majority of communities are located. Therefore, the desired operating range and outlet design water level for Lake St. Martin are based on the south basin.

FLOOD MANAGEMENT CRITERIA FOR THE PROJECT

Outlet Channel	Lake Water Level (feet)	Conveyance Flow Rate at Lake Water Level * (cubic feet per second (cfs))
Lake Manitoba	814.00	7,500
Lake St. Martin	801.00	11,500

*Actual flows through the outlets are governed by lake levels. Flows will be higher when lake levels are high and lower when lake levels are low. The outlet channels are also being designed to accommodate higher flows under these higher lake levels, such as a repeat 2011 flood event. The Lake Manitoba Outlet Channel can convey flows up to 8,800 cfs (250 m³/s) and the Lake St. Martin Outlet Channel can convey up to 17,000 cfs (481 m³/s) during these extreme flood events.

Re-evaluating The Narrows in Lake St. Martin

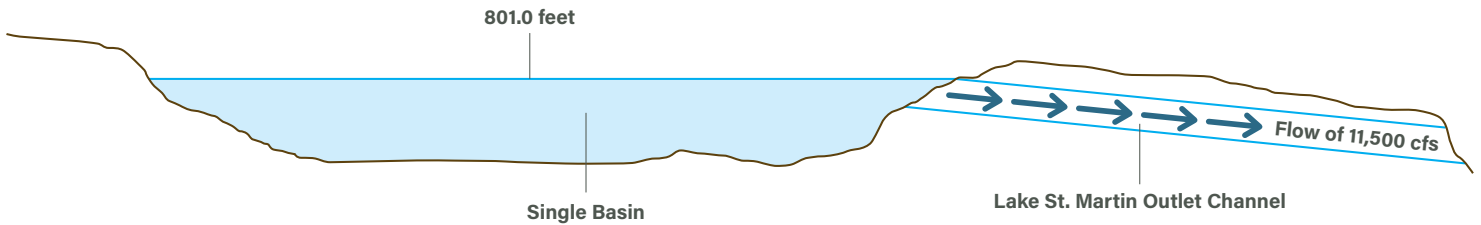
The design of the Lake St. Martin Outlet Channel was adapted to address concerns surrounding the Lake St. Martin Narrows (The Narrows) and consider Lake St. Martin as two separate basins instead of one, as originally assessed.

1. Original Design of the Lake St. Martin Outlet Channel

During the initial conceptual design process, the hydraulic model to evaluate water levels and flows in Lake Manitoba and Lake St. Martin made the assumption that Lake St. Martin acted as a single basin as shown below. This did not truly represent Lake St. Martin as it did not account for The Narrows, which acts as a flow restriction, causing the north basin water level to be lower than the south basin water level.

Original Model & Original Channel Design

Representation of Lake St. Martin



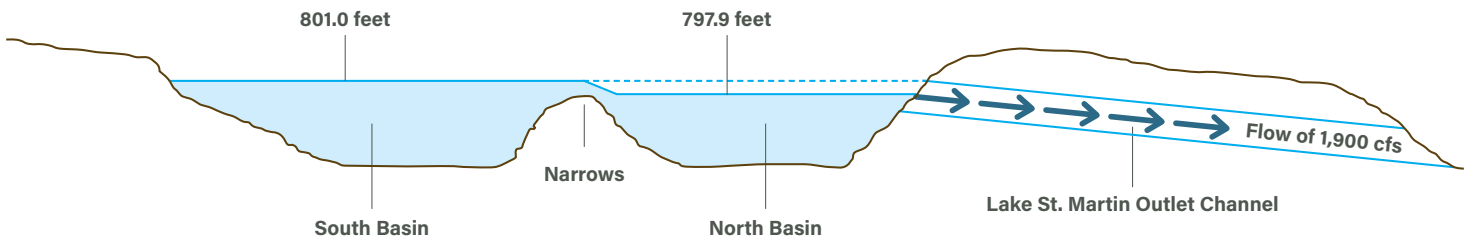
2. Refining the Model

As planning and design progressed, Lake St. Martin was modeled as two basins, the north and south basins. When The Narrows was included in the hydraulic model, water levels on the north basin dropped approximately 3 feet lower than the south basin due to the flow restriction.

This reduction in water level on the north basin resulted in lower outflows from the Lake St. Martin Outlet Channel and a reduction in the level of flood protection provided by the project.

Updated Model & Original Design of Channel

Representation of Lake St. Martin

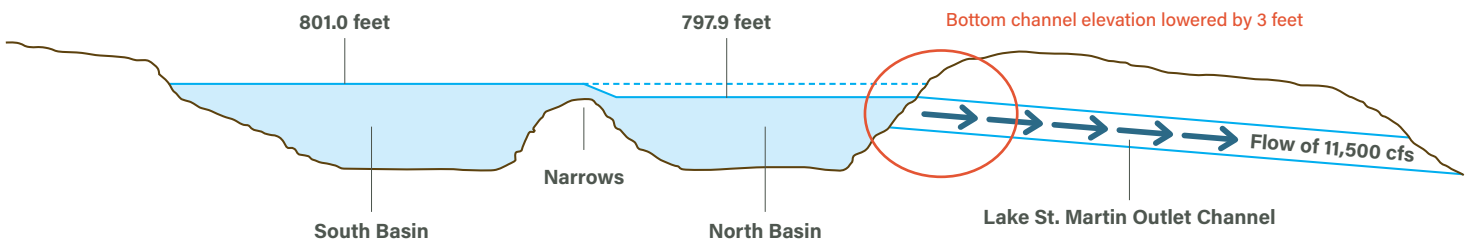


3. Updated Channel Design

In order to meet the flood protection levels for the project, design modifications were proposed for the Lake St. Martin Outlet Channel inlet control structure. The opening of the inlet control structure was lowered by 3 feet, as shown below. Portions of the upper reach were also lowered by approximately 1.5 feet to accommodate this design change to the inlet. These design changes ensure that the inlet now meets the design flow of 11,500 cfs at a south basin water level of 801.0 feet for 90 per cent of the time the channel is operated. For a repeat of the 2011 flood of record, the Lake St. Martin Outlet Channel can safely convey 17,000 cfs due to sediment mitigation measures (i.e. areas of the channel will be lined with rocks, this is known as armouring).

Updated Model & Updated Channel Design

Representation of Lake St. Martin



Impacts of the Design Changes to the Lake St. Martin Outlet Channels

Flood Protection

The updated model for Lake St. Martin will moderately reduce the overall flood benefit to Lake St. Martin in a repeat 2011 event. Manitoba Transportation and Infrastructure (MTI) has re-designed the Lake St. Martin Inlet Control Structure to prevent water levels on the south basin from reaching flood conditions during operation. The water level reduction calculated by the updated model for the south basin of Lake St. Martin is now 2.3 feet for the 2011 peak water level, whereas the previous reduction was 2.8 feet. Because of the direction of water flow, there is no alteration to water levels on Lake Manitoba.

The total time Lake St. Martin is projected to be below 800.0 feet, the top of its desired operating range for the lake, has decreased slightly from 94 per cent to 90 per cent of the time.

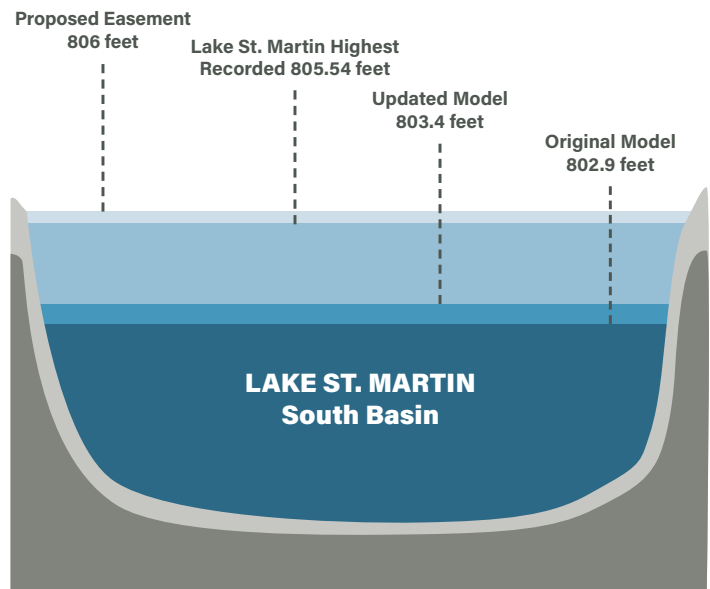
Flows on the Dauphin River

The Outlet Channels Project is not intended to control or remove flows from the Dauphin River. In severe drought years, MTI will stop baseflows through the Lake St. Martin Outlet Channel to maximize flows through the Dauphin River.

See the [Operations information sheet](#) for more details.

Ice Formation in The Narrows

The influence of ice formation within The Narrows was also incorporated into the updated model. Ice conditions and associated impacts to flow were estimated, and monitoring has begun to validate these assumptions. In the rare times when the Outlet Channels Project would be operated over winter, the ice-free area in The Narrows may be larger and the stability of the ice in these areas may be affected. MTI recognizes the importance of, and appreciates receiving, local knowledge on seasonal ice conditions in the area.



We Want To Hear From You

Please share your comments on the potential effects of the project by participating in meetings, or by contacting your local project Community Coordinator, band office, government office, or association or email outletchannels@gov.mb.ca. For updates on the Outlet Channels Project please visit the [Outlet Channels Project website](#).

For More Information

A series of information sheets have been developed to provide more detail on different aspects of the Outlet Channels Project, including:

- Project Components
- Project Alignment Options
- Water Levels and Flows
- Design Updates
- Operations

To view all the information sheets, visit the [Outlet Channels Project website](#).