

2017 High Water Levels: A Summary of Reported Impacts

by Shoreline Property Owners on Lake Ontario and the St. Lawrence River



During May and June 2017, Lake Ontario reached record high water levels causing significant impacts for shoreline property owners on Lake Ontario and St. Lawrence River. [The Great Lakes – St. Lawrence River Adaptive Management \(GLAM\)](#) Committee, a committee of the [International Joint Commission \(IJC\)](#), in collaboration with [Conservation Ontario](#) implemented a self-reporting questionnaire in late 2017 for shoreline property owners to describe their concerns regarding impacts from the high water levels. The questionnaire was based on a similar one developed by New York Sea Grant and Cornell University earlier in 2017. The GLAM Committee is grateful to all the shoreline property owners who took time to complete this detailed questionnaire. Information from the responses has already been included by the GLAM Committee as part of the report titled [Summary of 2017 Great Lakes Basin Conditions and Water Level Impacts to Support Ongoing Regulation Plan Evaluation](#). The information from this questionnaire and future questionnaires will continue to help the GLAM Committee:

1. Develop a further understanding of the impacts high water levels had on shoreline property owners; and
2. Compare water level impact assessment models used in the Lake Ontario—St. Lawrence River Study (LOSLRS) with reported impacts.

This document provides a general summary of the questionnaire responses from 2017 with a focus on flooding impacts, erosion impacts, shore protection impacts, business impacts and overall impacts. The GLAM Committee will continue to improve model assessment tools and understanding of shoreline impacts with the additional details from the

questionnaire.

The 2017 questionnaire was designed as an online, self-reporting approach and was advertised to Lake Ontario – St. Lawrence River residents in Ontario, New York and Quebec. The results from this survey reflect the responses of those who completed the questionnaire AND ARE NOT a complete representation of impacts across the broader shoreline.

The IJC and GLAM committee were granted permission by respondents for use of photos and quotes in this summary.

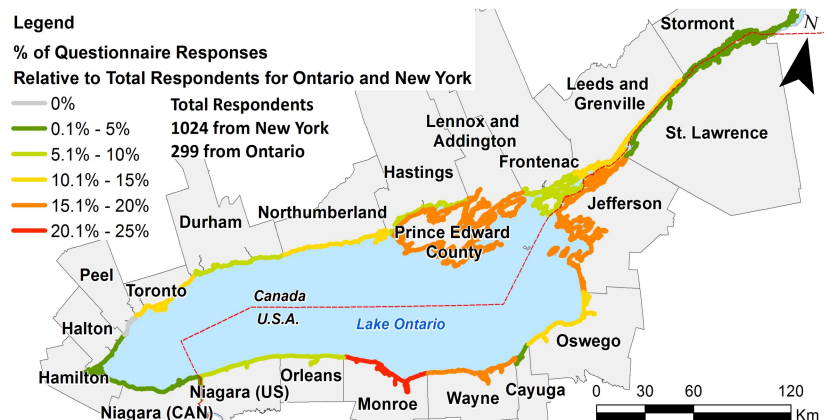
WHICH COUNTIES/MUNICIPALITIES DID QUESTIONNAIRE RESPONSES COME FROM?

1024 Respondents from New York

299 Respondents from Ontario

41 Respondents from Quebec

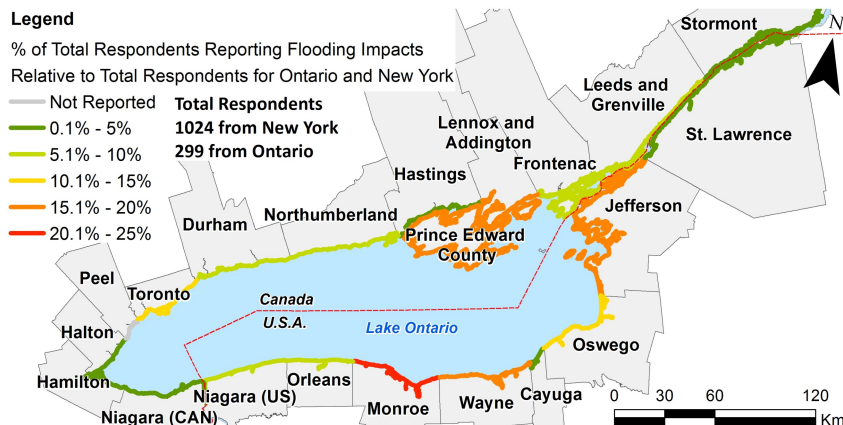
There were 1364 respondents to the 2017 questionnaire in total. Percentages of responses for each county are relative to the total number for each respective province or state (e.g. approximately 25% of New York State respondents were from Monroe County). Only 29 out of the 41 responses from Quebec are within areas of interest of the GLAM Committee. Due to the small sample size, responses from Quebec are not reported in this document although they will be used for internal data analysis.



WHERE WAS FLOODING REPORTED?

Just under 90% of respondents from New York and Ontario who completed the questionnaire reported some degree of flooding due to high water levels in 2017. In New York, Monroe County had the highest percentage of reported flooding followed by Wayne, Jefferson and Oswego counties. In Ontario, Prince Edward County, Lennox & Addington County and Toronto had the highest percentage of respondents reporting flooding.

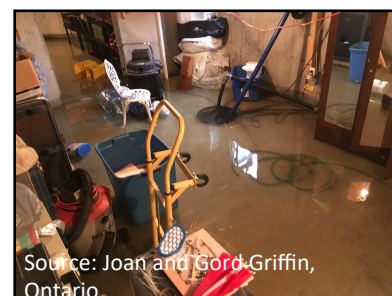
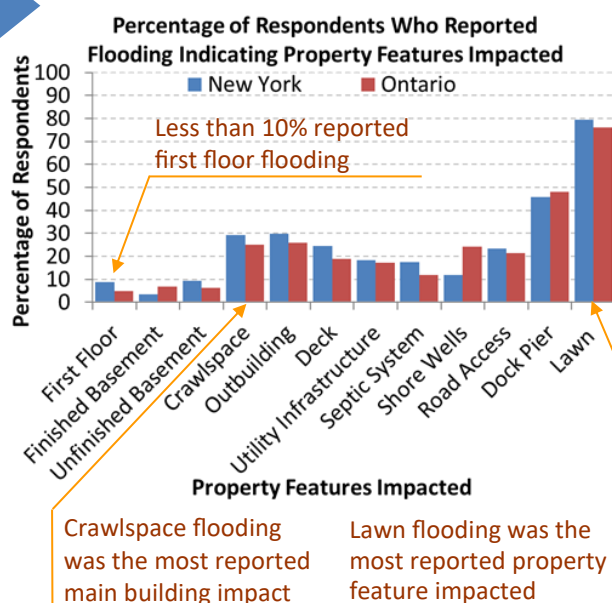
FLOODING IMPACTS



"Was very stressful and a big learning experience on many levels. The drying out process had been long & is ongoing (mould etc.) & we are doing everything we can to be prepared for another occurrence" - Respondent from Durham, ON

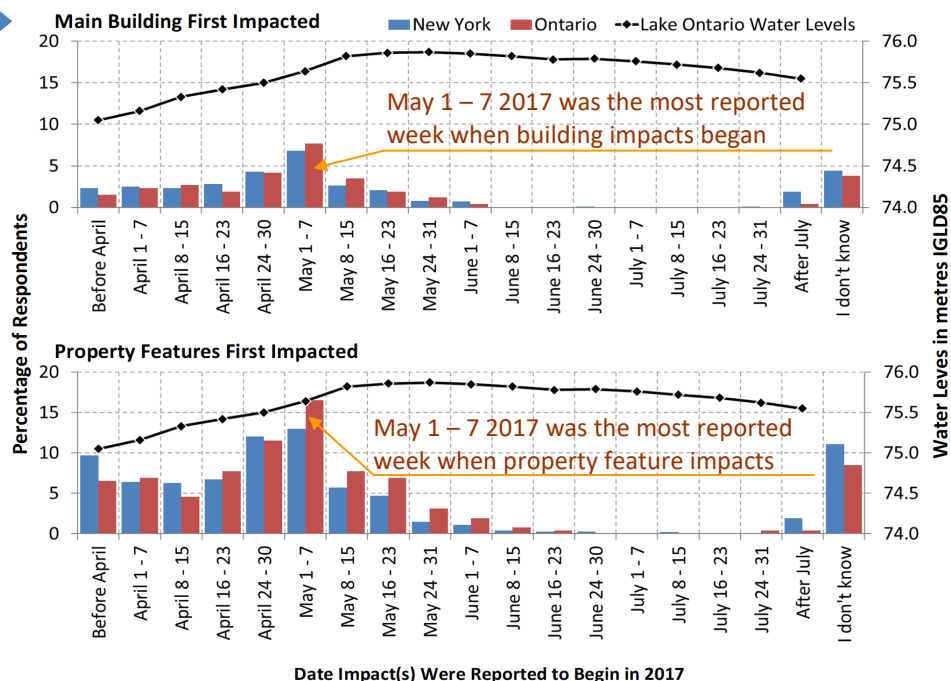
WHAT WAS IMPACTED BY FLOODING?

Lawn flooding was the most commonly reported impact in New York and Ontario, followed by dock flooding. **First floor flooding** to residential buildings was an economic metric used in earlier IJC studies. Less than 10% of respondents from New York and 5% from Ontario reported first floor flooding. Crawlspace flooding was the most commonly reported main building feature impacted in both New York and Ontario with just under 30% of flooded respondents for each.



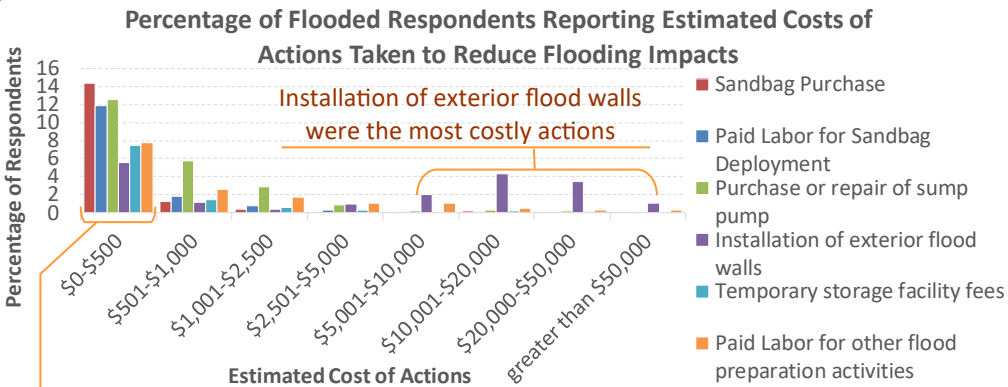
WHEN DID FLOODING BEGIN?

Respondents were asked to identify the week when their property feature(s) started to flood. May 1st to 7th, 2017 was the most commonly reported week for both buildings and other property features. The average water level for that week was 75.64 m (248 ft) International Great Lakes Datum 1985 (IGLD85). The second most reported week when impacts began was April 24th to 30th when the average weekly water level was 75.5 m (247.7 ft).



WHAT ACTIONS WERE TAKEN TO REDUCE FLOOD IMPACTS?

The majority of actions taken cost less than \$500. However, most reported that these actions did NOT fully prevent damages. Sandbagging (including paid labour for sandbag deployment) and sump pumps were the most commonly reported action to protect against flooding. Respondents indicated that these low cost actions reduced or slightly reduced damages. Sump pumps were the most effective action to prevent damages with some respondents reporting spending between \$500 and \$5,000 on pumps. Exterior floodwalls ranged from under \$500 to \$50,000+. This could be due to a variety of materials used for wall construction, depending on whether or not it was a temporary or permanent structure.



Majority of reported actions cost less than \$500

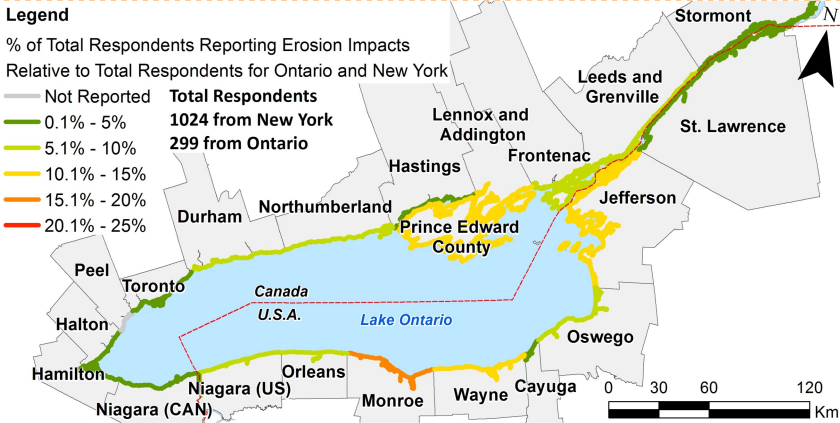
"It was a very stressful time. 400 Sandbags are still in place and will need to be removed next spring when threat of spring flooding has passed." – Anonymous from Belleville, ON



WHERE WAS EROSION REPORTED?

About 71% of respondents from New York and 61% of respondents from Ontario reported erosion due to high water levels in 2017. In New York, the highest percentage of reported erosion was in Monroe County followed by Wayne and Jefferson counties. In Ontario, the regions with the highest percentage of reported erosion were Prince Edward County and Lennox & Addington County.

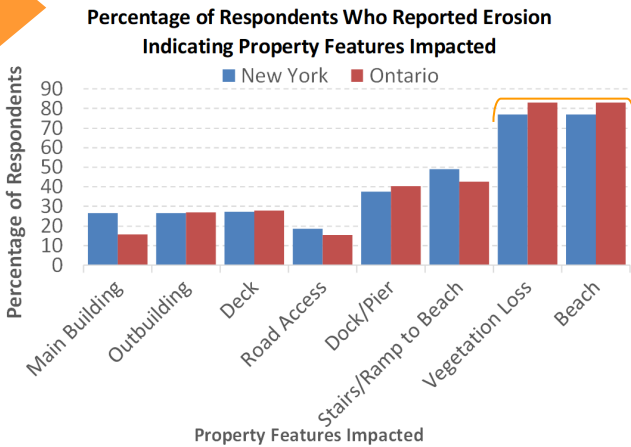
EROSION IMPACTS



"Lost several large willow trees on shoreline. Shoreline eroded back approximately 30 feet for a shoreline length of about 170 feet." Anonymous from Monroe, NY

WHAT WAS IMPACTED BY EROSION?

Beach impacts and vegetation loss were the most commonly reported erosion impacts (almost 80% of responses for each impacted property feature). Approximately 25% of respondents from New York and 15% from Ontario reported erosion impacts to the main building.

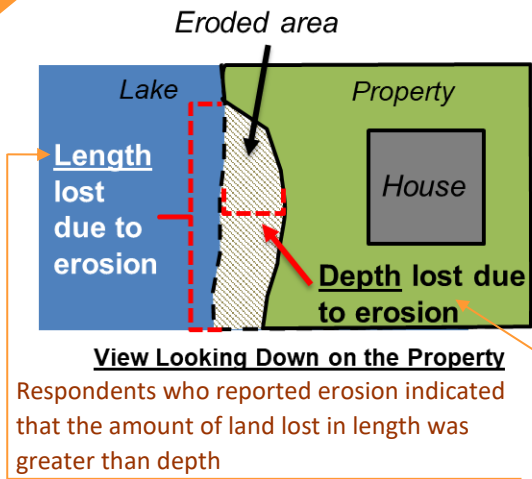


Vegetation and beach loss were the most commonly reported impact



HOW MUCH EROSION OCCURRED?

Respondents were asked to estimate the amount of land lost due to erosion in length (along the shoreline) and depth (into the property). The responses were quite variable. Over 16% of respondents reporting erosion damages indicated their land loss as very large (more than 3 m or ~10 ft in depth and more than 10 m or ~30 ft in length).

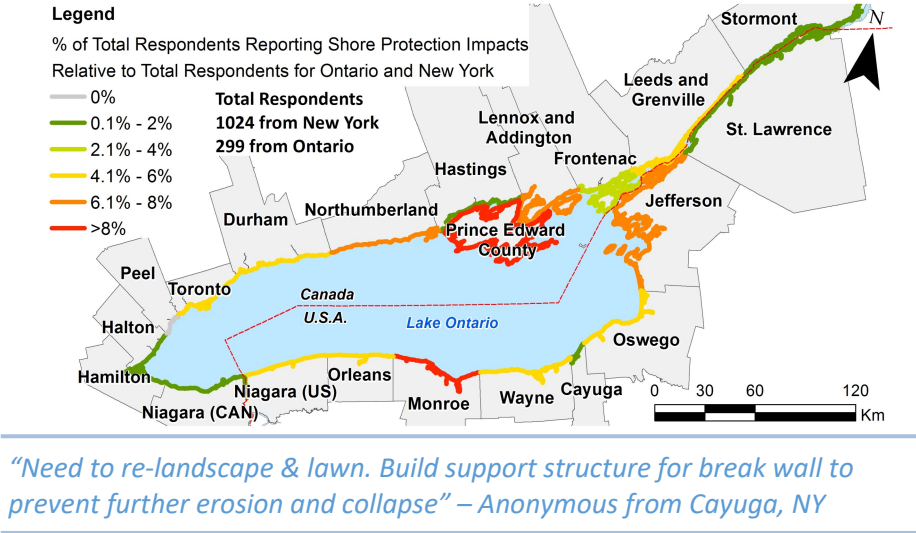


It was common for respondents who reported a large amount of land lost due to erosion to indicate the loss was mostly in length along the shoreline

WHERE WERE SHORE PROTECTION DAMAGES REPORTED?

Shore protection includes vertical and sloped structures, groynes (structures that are perpendicular to the shoreline) and natural protection built to slow erosion. Most reports of shore protection impacts in New York occurred in Monroe County, followed by Jefferson County. In Ontario, most reports occurred in Prince Edward County, followed by Northumberland and Lennox & Addington counties.

SHORE PROTECTION IMPACTS



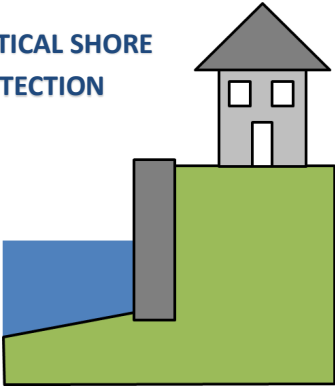
WHAT TYPES OF SHORE PROTECTION STRUCTURES WERE IMPACTED?

Approximately 90% of respondents with shore protection structures from New York and 85% from Ontario reported some degree of shore protection impact.

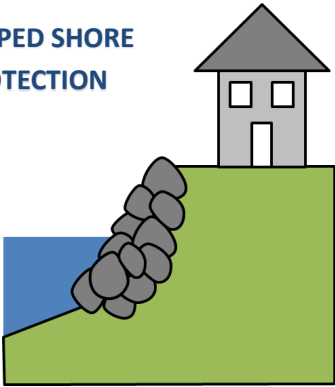
Approximately 75% of respondents with vertical shore protection structures reported damage to their structures and approximately half of those structures were between 20 to 50 years of age.

Approximately 80% of respondents with sloped shore protection structures reported damage to their structures with the majority of those structures were 50 years old or less.

VERTICAL SHORE PROTECTION

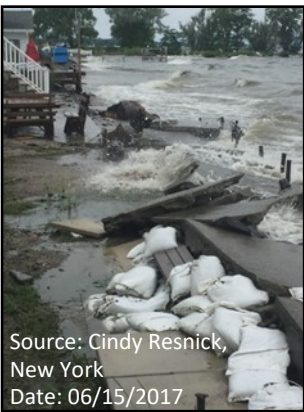
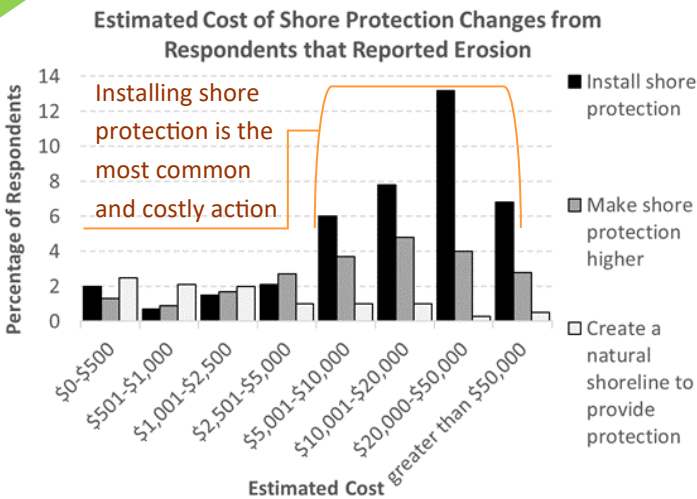


SLOPED SHORE PROTECTION



WHAT ACTIONS WERE TAKEN TO PROTECT THE SHORELINE?

Respondents were asked if they considered modifying existing shore protection structures or installing a new structure to protect against further erosion and if so, to provide cost estimates. The cost to build shore protection structures to protect against erosion was an economic metric used in earlier IJC studies. Installing shore protection was the most commonly reported action to protect against erosion. Several respondents also considered making existing shore protection structures higher. Most respondents estimated these actions would cost from \$5,000 to greater than \$50,000.

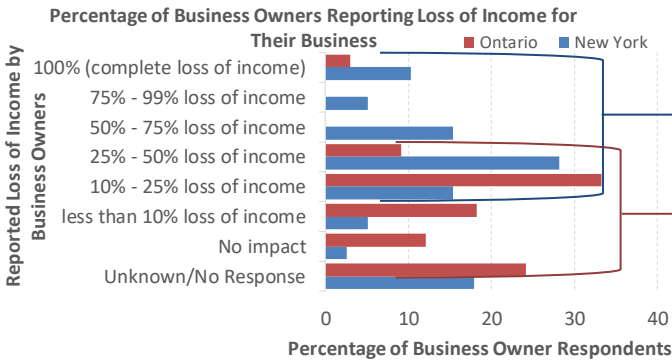
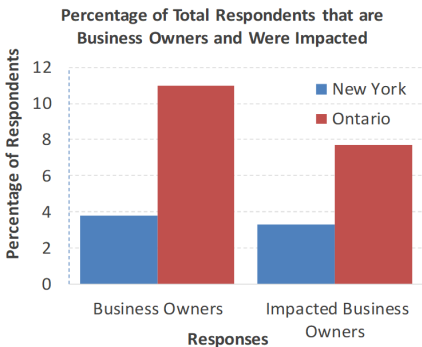


“Devastating, emotional[ally] and financially the cost of building a retaining wall for the shoreline now that this erosion has occurred will be over \$50,000” - Anonymous respondent from Lennox & Addington, ON

HOW WERE BUSINESSES IMPACTED?

Approximately 4% of respondents to the questionnaire from New York and 11% of respondents from Ontario identified themselves as business owners. The most common business types were marinas, boat launch services and restaurants.

Business owners attributed their loss of income to having fewer visitors, decline in sales, accessibility issues, inability to completely operate and physical damage caused by high water levels. Responses were fairly evenly distributed in these categories. Only a few respondents indicated their business impacts were related to forced closure.



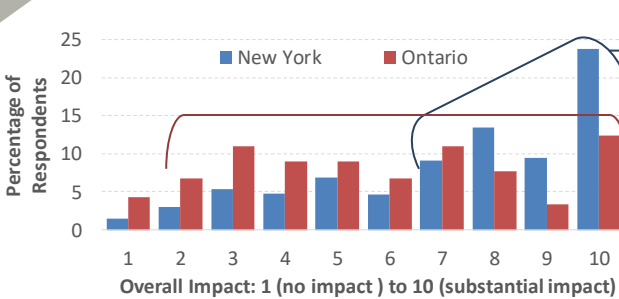
In New York, approximately 75% of business owners responses reported 10% to 100% loss of income

In Ontario, 97% of business owner responses reported less than 50% loss of income or loss was unknown

OVERALL, HOW WERE RESPONDENTS AFFECTED?

All respondents were asked to rank the overall impacts of high water levels (1 = no impact, 10 = substantial). Approximately 55% of New York respondents ranked their overall impact as 7 or greater, compared with 34% of Ontario respondents.

OVERALL IMPACTS



Average of New York responses is 7.3 and 55% of respondents ranked impacts as a 7 or greater.

Average of Ontario responses is 5.7 with responses more evenly distributed between low (2) to substantial (10).