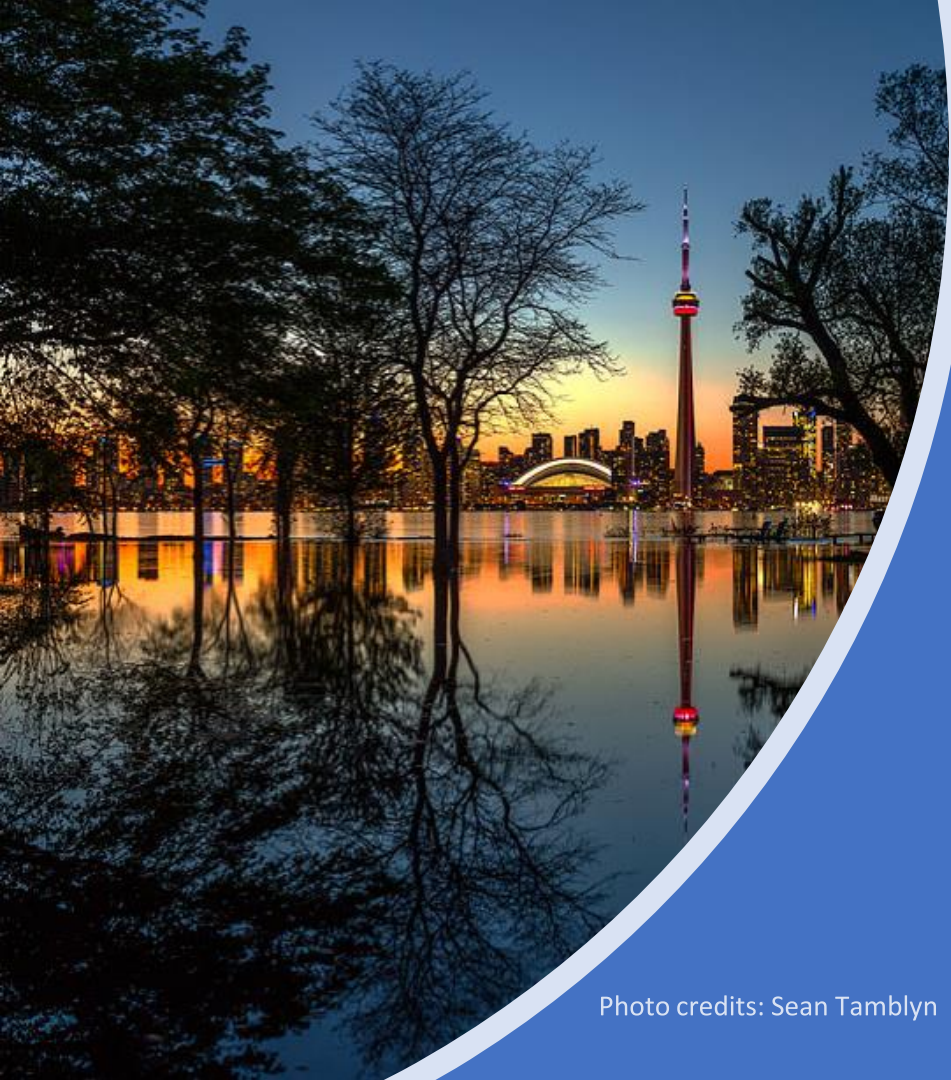


Toronto Islands Flooding and Mitigation

RE: IE8.5

Presented by: Rehana Rajabali
Senior Manager, Flood Risk Management

October 17, 2019



Toronto Islands Flooding and Mitigation

Photo credits: Sean Tamblyn

Presentation Outline

- Great lakes watersheds
- Factors that influence Lake Ontario levels
- Comparison of 2017 and 2019 conditions
- Lessons learned in the interim
- Highlights from Flood Mitigation Report

3 factors that influence Lake Ontario levels

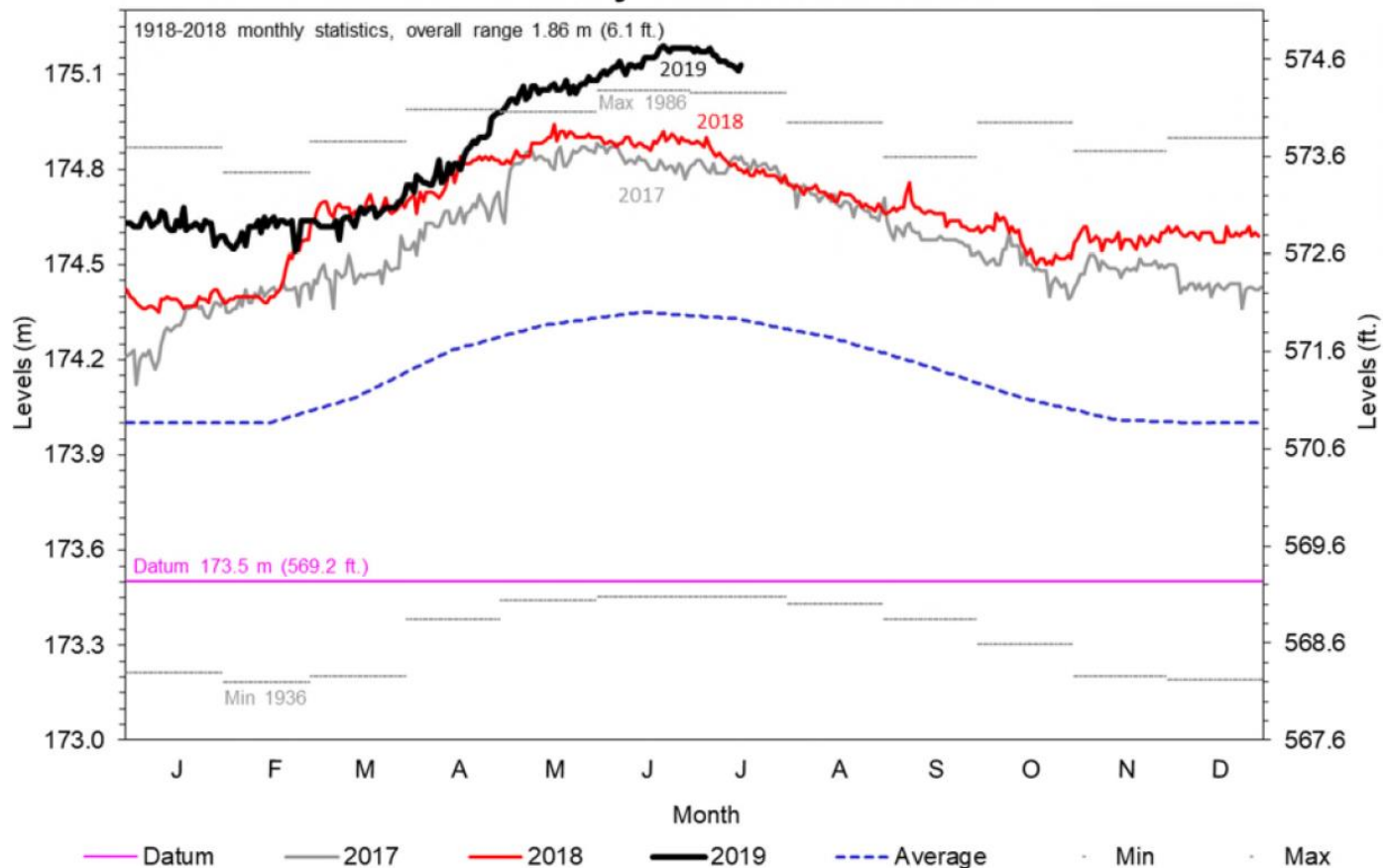
1. Inflow from Lake Erie (uncontrolled)

2. Precipitation (rain or snowmelt) in the Lake Ontario watershed

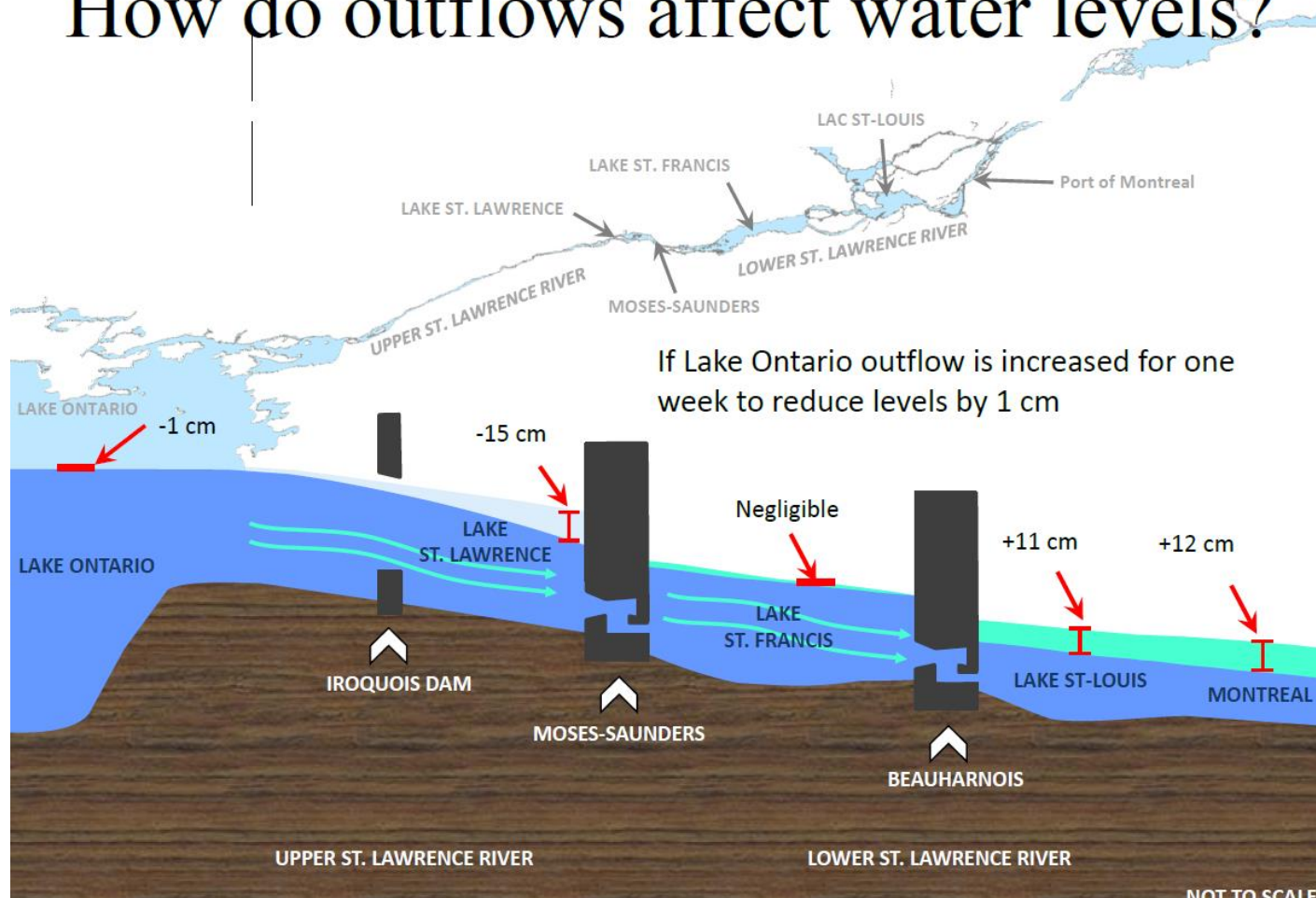
3. Outflow from Lake Ontario (controlled by IJC at Moses Saunders Dam to balance upstream and downstream risks. Downstream risks influenced by Ottawa River flows.



Daily Lake Erie Levels



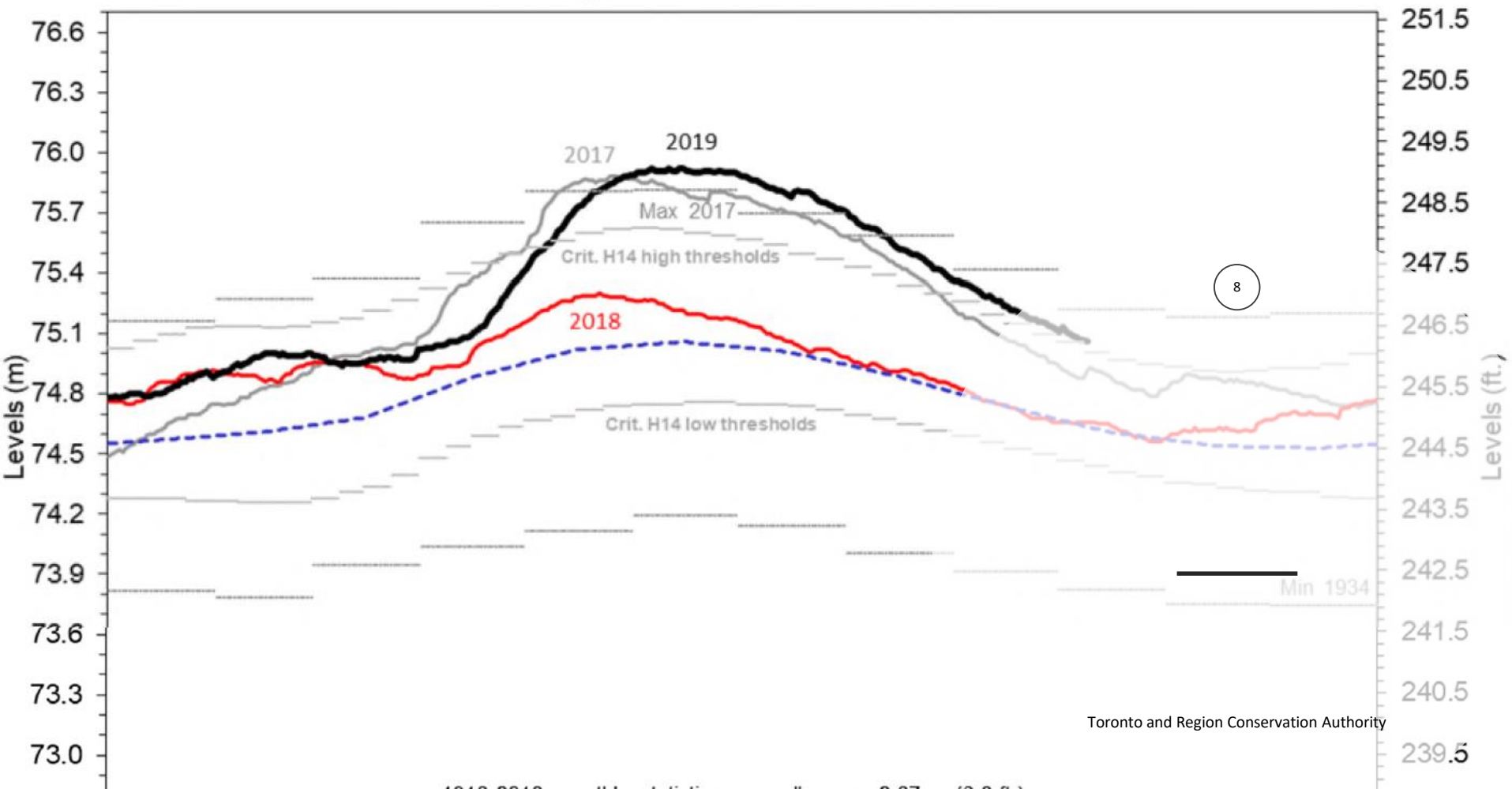
How do outflows affect water levels?



2017 vs 2019 – Same same, but different

- 2017 lack of stable ice cover in winter more significant
- 2017 early spring rainfall over Lake Ontario watershed more significant, 2019 late spring rainfall
- 2019 inflows from Lake Erie more significant
- In both cases, spring flooding on the Ottawa River and requirement to balance upstream and downstream risks a significant driver
- 2017 fewer wind events at peak level
- 2019 longer duration at peak level, later peak

Daily Lake Ontario Levels



Lake Ontario High Levels



Photo credit: Sean Tamblyn

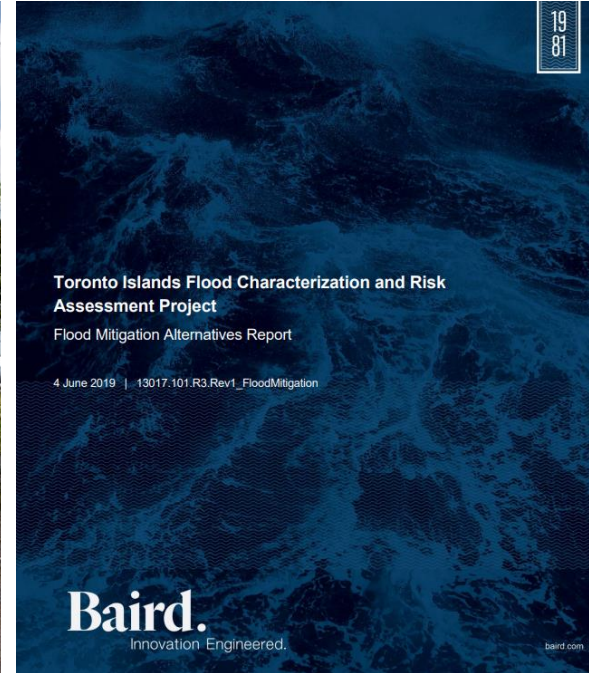
TRCA support for flood response

The image shows a screenshot of a web application titled "Lake Ontario High Levels 2019 WebApp". The browser address bar shows the URL <https://arcgis01.trca.on.ca/highwaterlevels/>. The main map area displays an aerial view of Pickering, Ontario, with blue shaded regions indicating flooded areas. A popup window titled "(1 of 4)" provides details for a selected feature:

- Category: Erosion
- Other - Category: Other - Category
- Actions: Structure condition reported to TRCA staff and through IIMS
- Notes/Comments: TRCA structure (WF32.02) Armourstone displacement Concrete path undercut 2017 damage exacerbated
- Reviewed: Yes
- Attachments: [P5130025.JPG](#)
- Edited by: trca.R.Lucero on 5/14/19 at 10:38 AM
- Zoom to: ...

In the bottom right corner, there is a smaller browser window showing a photograph of a rocky shoreline with waves crashing against the rocks, illustrating the physical impact of the flood.

Leveraging lessons learned from 2017



Four components to this study

- Flood Characterization Report
- Flood Risk Assessment Report
- Flood Maps (used in 2019)
- Flood Mitigation Alternatives Report



Long-term mitigation measures

- Establish perimeter berms plus drainage areas (primary method for residential areas)
- Raising of roads
- Critical infrastructure protection (seawall around water treatment plant)

Toronto and Region Conservation Authority

MINIMIZE DAMAGE TO EXISTING TREES WHERE POSSIBLE

BERM CREST (76.5m)

BERM TOE (VARIES)

BERM TOE

BERM CREST

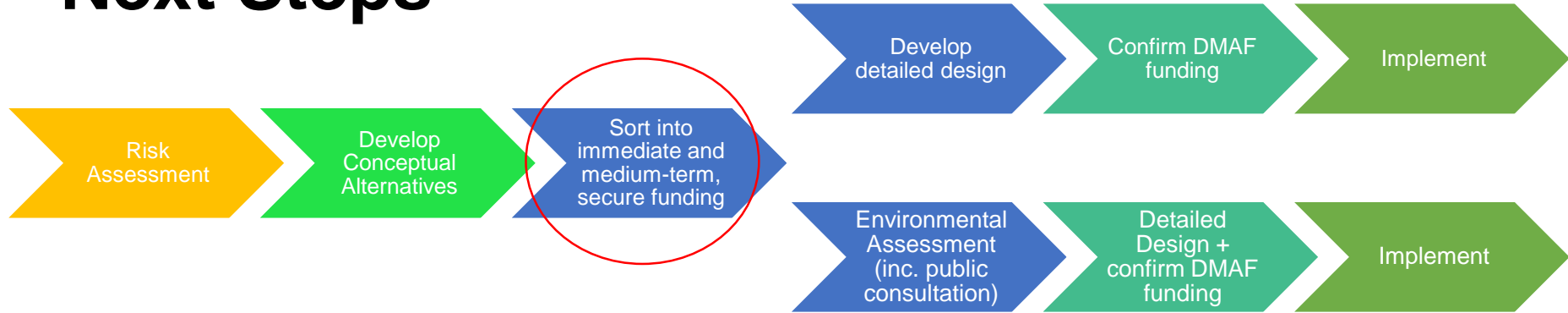
E

LEGEND	
EXISTING SUMP	 S
PROPOSED SUMP	 S
BEACH	
ARMOUR STONE	
CONCRETE PATH	
BERM	
CONCRETE WALL	
PEDESTRIAN BRIDGE	
SWALE	
CONCRETE FLOOD WALL	
ELEVATED SEAWALL	
ELEVATED ROADWAY	

Multi-functional flood protection



Next Steps



- Update Flood Characterization to account for this year's water levels (complete)
- Sort recommendations into short-term, medium-term, and long-term, and confirm whatever additional studies may be required (ie: confirmatory soils studies, Environmental Assessments, etc.)
- Work with City of Toronto to confirm funding and to move towards implementation of preferred solutions, targeting Disaster Mitigation and Adaptation Fund for capital works.

Thank you

Rehana Rajabali, P.Eng., MUDS
Senior Manager, Flood Risk Management
Development and Engineering Services
Rehana.Rajabali@trca.ca

www.trca.ca



www.trca.ca/flood



[@TRCA_Flood](https://twitter.com/TRCA_Flood)

