

Flood Risk Management

Climate Change, Urban Risk Management & Sustainability Forum

2019 SULIVER PUBLIC FORUM, New York

Presentation by:
Laurian Farrell
Oct 25, 2019

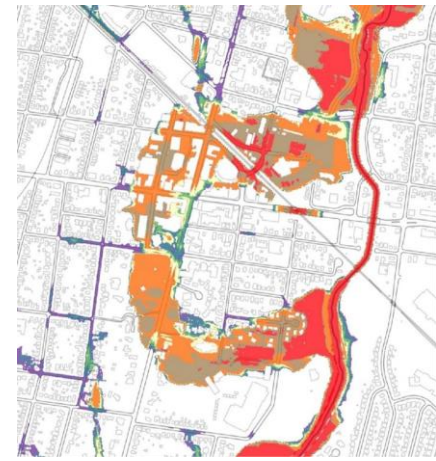


Infrastructure Challenges and Policy Solutions

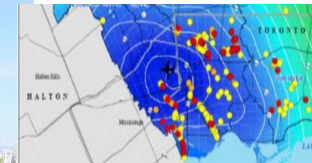
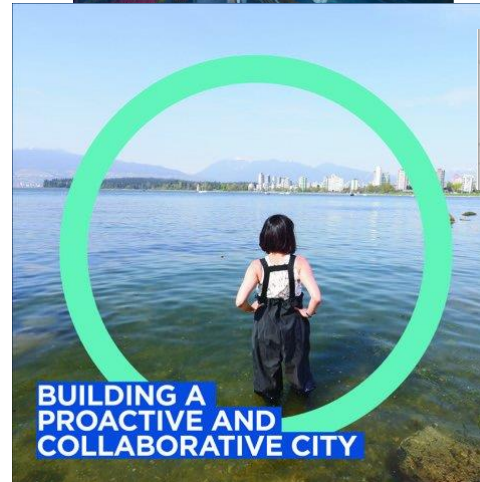
Acknowledgements

PIONEERED BY THE
ROCKEFELLER FOUNDATION

100 RESILIENT CITIES



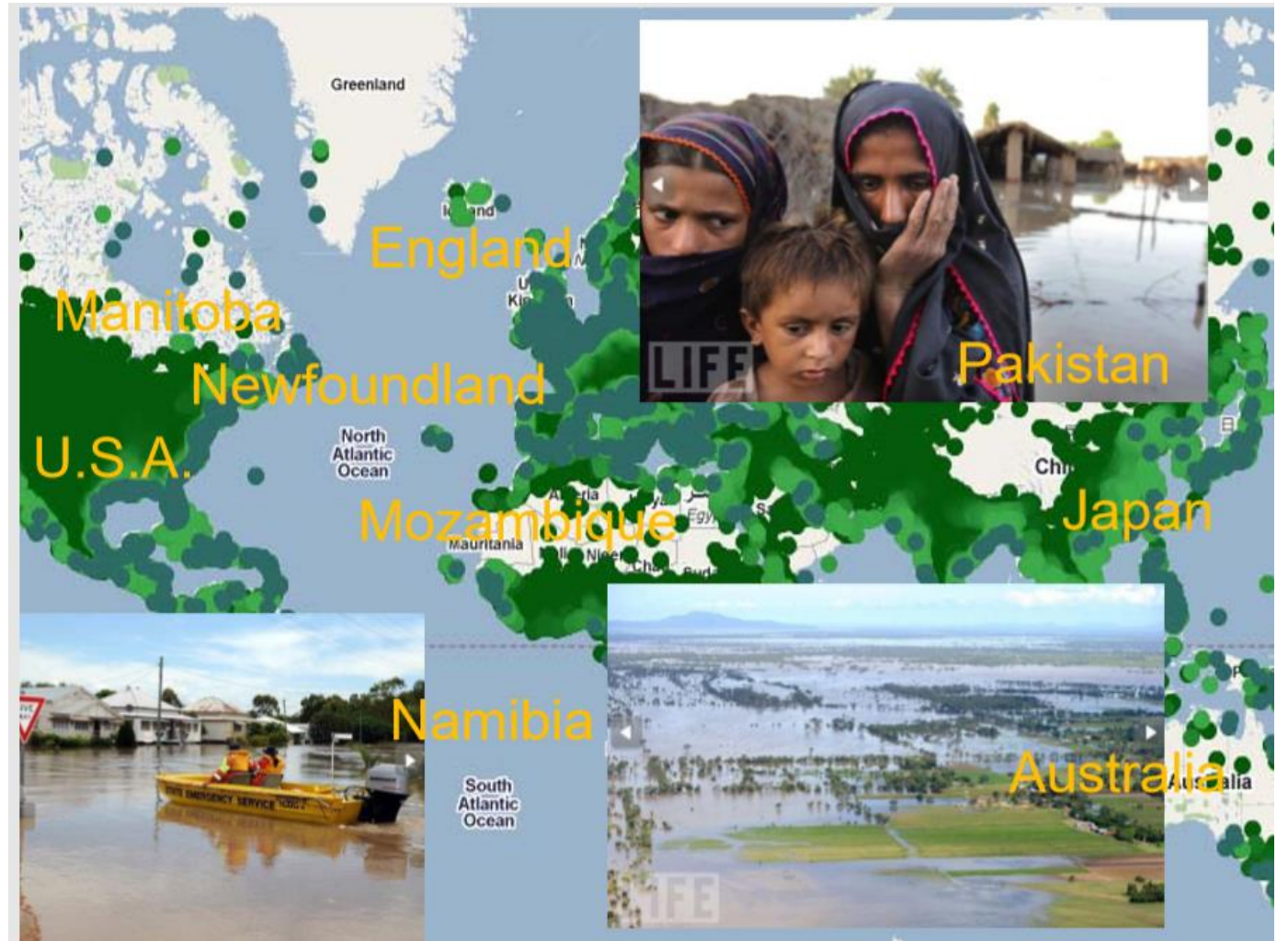
LAURIAN FARRELL
SR. MGR. FLOOD RISK MANAGEMENT
TORONTO REGION CONSERVATION AUTHORITY



 **BRAMPTON**
Flower City
brampton.ca

 **Toronto and Region
Conservation**
for The Living City®

What is flood risk?





Hurricane Hazel: October 16th, 1954

Pre-Hazel:



Infrastructure Era:



Floodplain Protection:



Challenge: what will the next big storm look like?

Evolution of Flood Management in Ontario, Canada

Development Near Water

Water Control and
Conveyance

Allow Natural Channel Process
Build Outside Floodplain



Challenge: existing infrastructure is failing



Initial Response to Flood Risks



**Challenge: modern systems
are not performing as
predicted**



Balancing Nature and New Development

Regulated Areas



VALLEY CORRIDOR



WATERCOURSE



WETLANDS



STREAM CORRIDOR

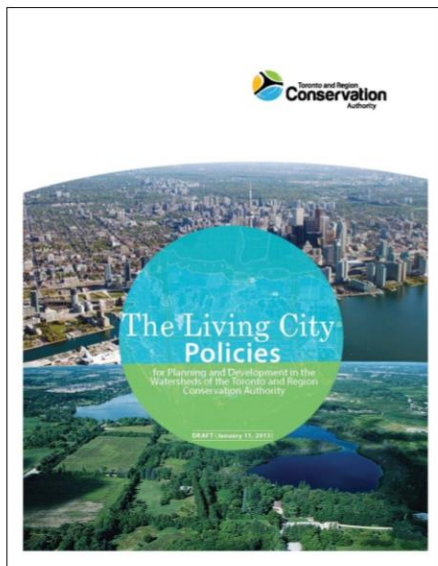


LAKE ONTARIO SHORELINE



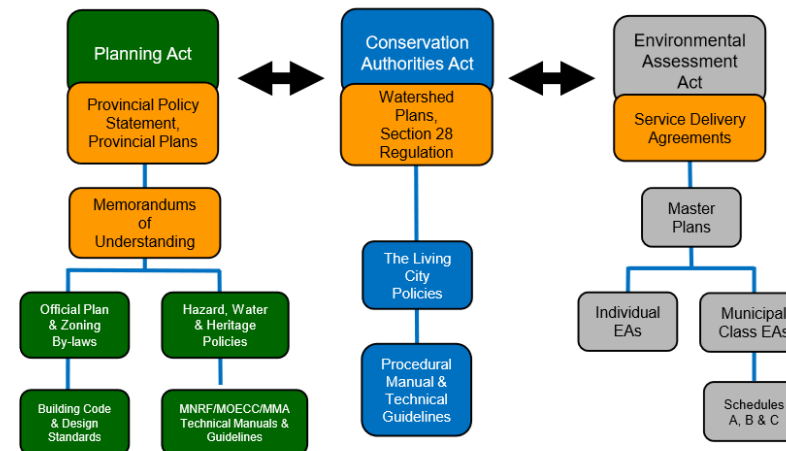
**AREA ADJACENT TO
WETLANDS (120m or 30m)**

Toronto and Region Conservation Authority



1. Introduction
 2. The Toronto Region
 3. Legislative Foundation
 4. TRCA History & Evolution to The Living City
 5. The Living City
 6. Paths to Achieving The Living City: Policies for Sustainable Communities
 7. Policies for Environmental Planning
 8. Regulation Policies
- Appendices
Glossary
References

TRCA Plan Review Roles & Responsibilities



Toronto and Region Conservation Authority

Regulatory Environment

Flood Plain Management Approaches

- One-Zone (primary; most restrictive)
- Two-Zone (exception; floodway-flood fringe)

- Special Policy Areas (unique circumstances):
 - historical communities in the flood plain
 - limited scope of development and redevelopment to allow for continued social and economic viability and revitalization
 - not intended for intensification
 - approved by Ministers of Municipal Affairs and Natural Resources and Forestry

Municipalities

- Implemented through Official Plans and Zoning By-laws
- Policies tied to TRCA's roles and responsibilities
- Initiate comprehensive SPA reviews or amendments to SPA policies, boundaries or land use designations

TRCA

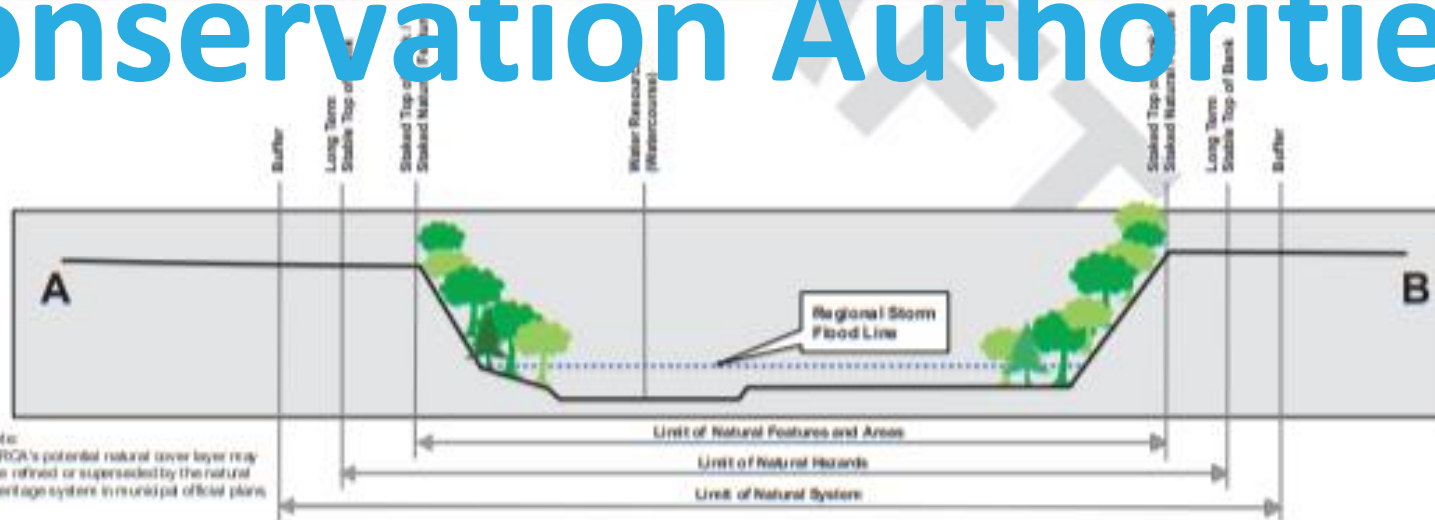
- Delegated Provincial Interest - Natural Hazards
- Public Commenting Body - Planning Act, EA Act
- Regulator - Permits under CA Act
- Service Provider - MOUs
- Resource Management Agency
- Landowner

Policy

Limits of the Natural System Valley Corridor - Urban Scenario



Challenge: new government regimes can change the Conservation Authorities Act



Note:
*TRCA's potential natural cover layer may be refined or superseded by the natural heritage system in municipal official plans.

Toronto rainfalls breaks records in 2017

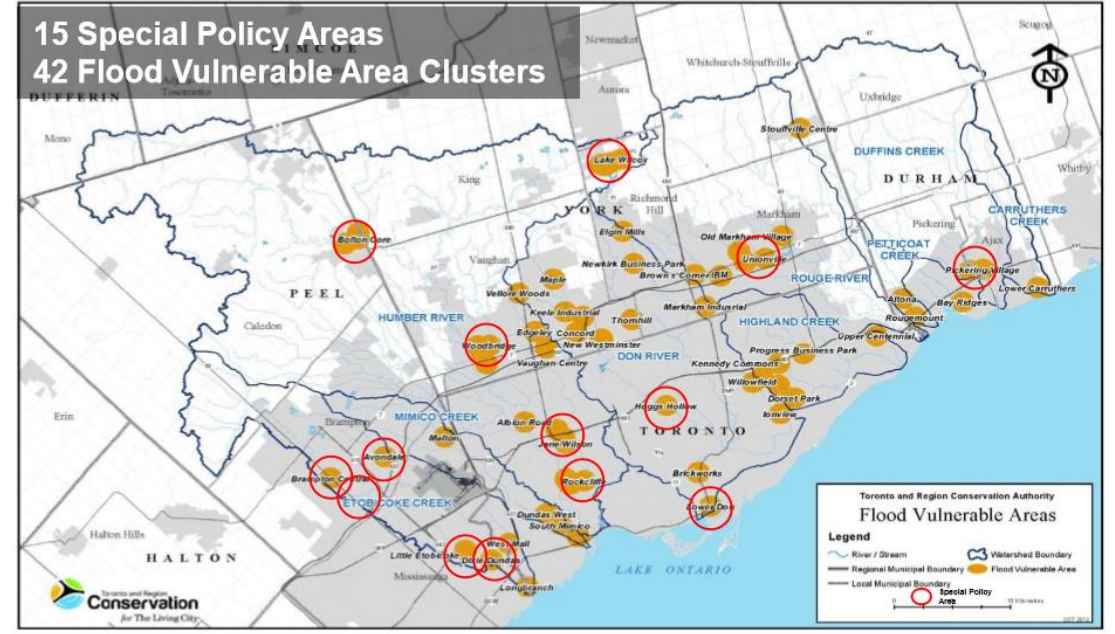
“ The total rainfall from April 1 until May 25 this year has been almost double what is normally seen
 - Dave Phillips, climatologist for Environment Canada ”

- 1** FLOOD WARNING
- 5** FLOOD WATCH
- 10** FLOOD OUTLOOK
- 19** WATER SAFETY




36 Flood Messages were issued in 2017 by our flood duty officers

Visit: www.trca.ca/flood



Toronto and Region Conservation Authority

Risks Change

A person is walking away from the camera down a street that is completely flooded. The water is deep enough to reach their knees. They are wearing a dark jacket, light-colored pants, and carrying a dark bag over their shoulder. They are holding a patterned umbrella. The street is lined with parked cars on both sides, and the background shows a typical urban street scene with buildings and more cars. The overall tone is somber and grey.

Riverine Flooding
vs. Urban
Flooding

A person walks down a flooded street in Hoboken, New Jersey. // Gary Hershorn/Reuters





Challenge: People are not adequately engaged in their safety and well being



Human Behaviour

Downtown Revitalization

Brampton Ontario

City Hall



Current Barriers in Brampton

600 m long trapezoidal concrete lined channel

Flood Risk

SPA Restrictions

Funding

Existing Infrastructure

MNRF Policy





BUILDING A PROACTIVE AND COLLABORATIVE CITY



Thank You

[linkedin.com/in/LaurianFarrell](https://www.linkedin.com/in/LaurianFarrell)