Team

# 06.

# FLOODSCOPE: Canada Pluvial Flood Risk Concentration and Scenario Explorer

## How can financial institutions like TD Bank quantify building-level pluvial flood exposure?

**Existing regulatory frameworks focus on fluvial flooding and do not capture pluvial risk, where intense rainfall overwhelms drainage systems regardless of proximity to rivers.**



Urban flood risk is intensifying across Canada due to climate change, rapid urbanisation, and increasing impervious surfaces, particularly in dense regions such as the Greater Toronto Area. FloodScope builds a probabilistic pluvial exposure-screening dashboard for 592,176 GTA buildings, enabling TD Bank to identify portfolio exposure concentration and stress-test flood risk under extreme rainfall scenarios.

## Methodology

**Step 1: Collected public flood, rainfall, terrain, and building data for the GTA and analyzed building-level terrain features using QGIS and Python.**

**Step 2: Built a flood risk model by combining terrain and rainfall factors, then ran simulations to estimate expected and extreme flood risks.**

**Step 3: Analyzed, mapped, and visualized the results in Python using an interactive dashboard.**

## A collaborative project with:

UNIVERSITY OF TORONTO

YORK UNIVERSITÉ UNIVERSITY

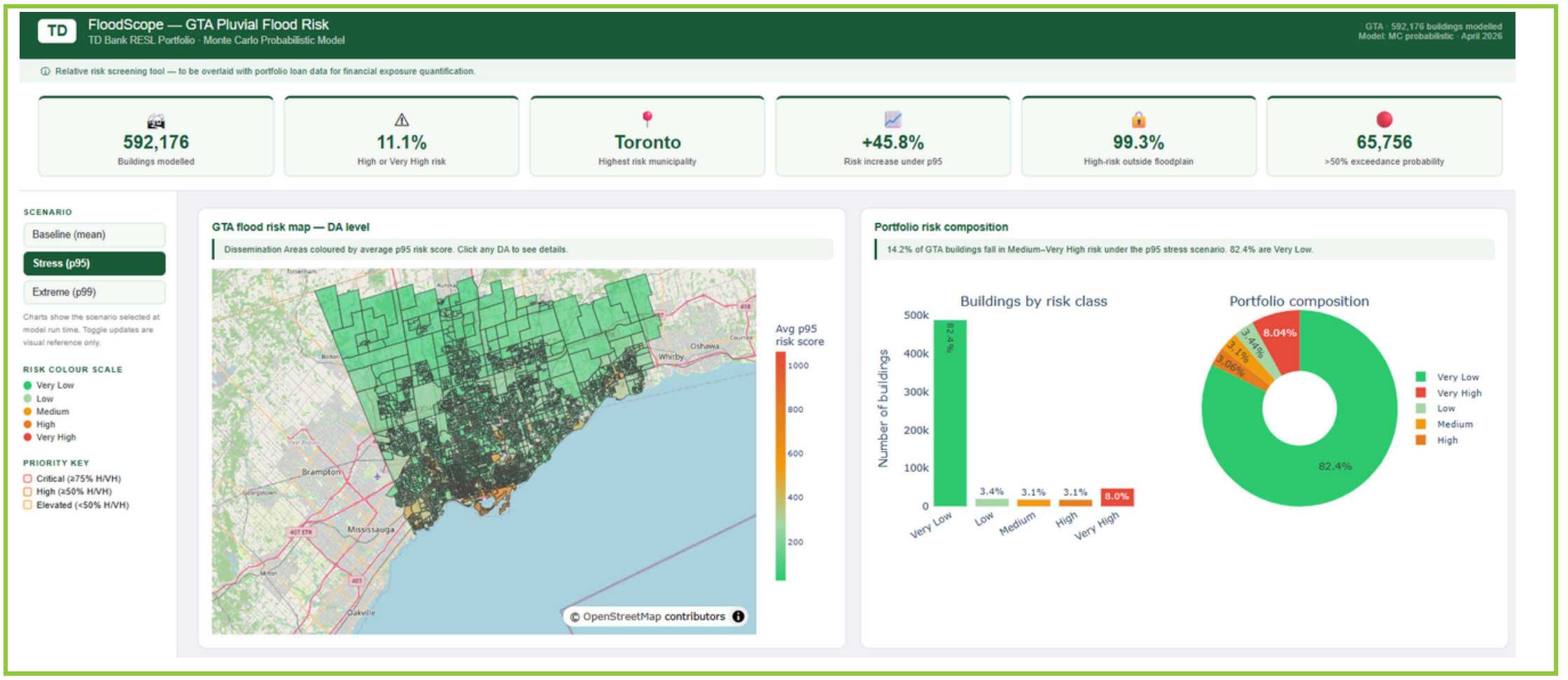
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# The Dashboard

Analysis of 592,176 GTA buildings shows that pluvial flood risk and exposure concentration increase significantly under extreme rainfall, with Toronto emerging as the highest-risk area.

## Dashboard Preview




- FloodScope delivers a probabilistic spatial risk framework and interactive dashboard covering 592,176 GTA buildings under baseline and stress rainfall scenarios, along with Python tools for integrating internal portfolio data.

## Next Steps?

The model relies on public terrain data and simplified assumptions, excluding drainage infrastructure, underground waterways, and historical flood event validation. Future work could incorporate finer spatial data, hydraulic modelling, and internal TD claims and insurance portfolio data.

# Team 6

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Risk and Insurance Studies Centre

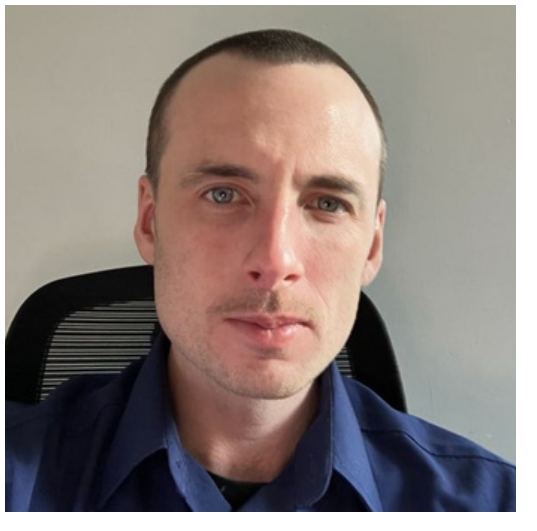
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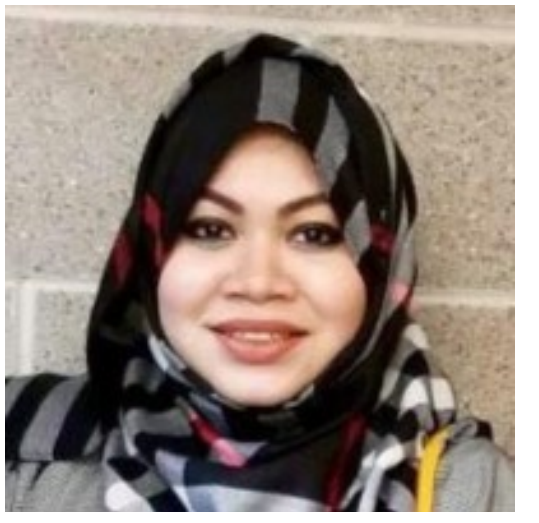
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