



Examining the Exposure of Canadian Urban Population to Future Flood Risk

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This study highlights the growing risk of flooding to Canadian population under climate change. Assessment is performed by considering robust future flow projections made by 21 Global Climate Models under four Representative Concentration Pathways (RCPs). Future projected changes in the frequencies of large (100-year and 250-year return period) floods are analyzed at 100 most populated Canadian cities. In Canada, protection against large flooding events is managed by systematic regulation of 1072 streamflow regulatory structures. This study analyzes projected future changes in flood magnitudes and timings at these locations to assess if an adjustment in their regulation will be required in the future. Results indicate that 40%-60% of the analyzed cities including Toronto and Montreal can experience large increases in flood-risk in future.

Among the analyzed cities, Sault Sainte Marie (RCP 2.6), Saint Catharines-Niagara (RCP 4.5), and Halifax (RCP 6.0) are projected with largest increase in flood hazard, with an updated historical return periods of 4-year, 4-year, and 1-year respectively. Highly populated cities like Toronto (RCP 2.6 and RCP 8.5), and Montreal (RCP 4.5 and RCP 6.0) are projected with most increase in flood-risk whereas Kelowna (RCP 2.6, RCP 4.5), Hamilton (RCP 6.0), and Trois-Rivieres (RCP 8.5) are projected with larges decrease in future flood-risk.