Climate Change and Flooding

FACTSHEET SERIES

The City of Richmond is a collection of islands with an average height of 1 metre (3 feet) above sea level and is part of the historic floodplain of the Fraser River. The City relies on a network of dikes, pumps, and other systems to protect it from flooding. Richmond is exposed to flooding from the river, the ocean, and from heavy rainfall events. Sea levels are rising due to global warming, and the frequency and intensity of storms are increasing. As climate change continues, Richmond's exposure to coastal and river flood hazards will increase.

Richmond Flood Hazards

SEA LEVEL RISE

With climate change, warmer temperatures melt glaciers and ice caps and increase the temperature of the ocean, causing water to expand. As a result, global sea levels are rising. Sea level rise increases flood risks posed by:

- **king tides:** the highest tides of the year;
- **coastal storm surges:** high tides mixed with high water levels caused by wind and waves.

The Province of British Columbia advises municipalities to plan for 1 metre of sea level rise by 2100. During this same period, land in Richmond is expected to move downwards by 0.2 metres as land settles into the Fraser River delta.

FRESHET

Freshet is the term used to describe river floods caused by snowmelt that typically occurs in the spring. Changes in snowmelt and precipitation patterns in the Fraser Basin are expected to contribute to larger and more frequent floods on the Fraser River. Sea level rise will heighten water levels in the lower Fraser River during spring freshet.

RAINFALL

Over the past 20 years, the average intensity of rainfall events in Richmond has increased by approximately 15 per cent. With climate change, this trend is expected to continue. Extreme rainfall events can increase the flow, speed, and height of the water in the Fraser River.

▲ ***SALISH SEA RISING:*** *A child born today can expect 50 centimetres of sea level rise by the time they're 30 and 1 metre by the time they are 80. The lighter shaded area shows a higher range of sea level rise that could occur if global emissions reduction targets are not met.*

▲ ***RICHMOND ATMOSPHERIC RIVER:*** *The atmospheric river events that hit the province in November 2021 are examples of extreme rainfall events that can lead to flooding. While Richmond did not experience the same level of rainfall or flooding as some areas of the Fraser Valley, it did receive over 130 millimetres of rain in a three-day period, which is the biggest storm Richmond has faced in half a century. The image shows the flooded low-lying park fields around Walter Lee elementary during the atmospheric river events in November 2021. Low lying areas like this park help store excess rainwater during extreme events and will drain when the system has capacity to do so. Carlos Silva photo, via Twitter.*

How is Richmond Planning for Change?

As a community made up of islands in the Fraser River's estuary, the City of Richmond is a recognized leader in sustainability and climate action. For decades, the City has implemented climate action work including mitigation and adaptation plans, actions and strategies. The City also recognizes that even with efforts to reduce greenhouse gas emissions, there will be environmental changes that are unavoidable.

COMMUNITY ENERGY AND EMISSIONS PLAN

Richmond's Community Energy and Emissions Plan 2050 includes actions that will set Richmond on a path to achieve 50% reduction in community greenhouse gas emissions by 2030 and reach net zero emissions by 2050. This plan builds on Richmond's climate action leadership and provides a roadmap for achieving the further greenhouse gas emission reduction targets set by Council. These targets are consistent with the United Nation's 1.5°C global warming limit.

FLOOD PROTECTION MANAGEMENT STRATEGY

Richmond's Flood Protection Management Strategy will upgrade dikes from their current elevation of 3.5 metres above sea level to 4.7 metres above sea level. This is being done to stay ahead of sea level rise and increase the city's resilience to river floods. Richmond City Council recently accelerated the timeline to raise dike heights and improve their supporting infrastructure.

Plans for upgrading Richmond's dikes are laid out in the Dike Master Plan, which includes the decision to raise the perimeter dike around all of Richmond. Dike raising not only provides greater flood protection but can also provide opportunities to improve wildlife habitat and recreation benefits in some locations, including improved access to the shoreline, transportation safety improvements (like new bike lanes), and public amenities like new seating and recreation areas.

MORE INFORMATION?

Visit **richmond.ca/floodprotection** to:

- learn about what Richmond is doing for flood protection and growing climate change risks
- share your thoughts and feedback

Richmond