



# Introducing the Lower Mainland Flood Management Strategy



A new initiative is underway to develop a **Lower Mainland Flood Management Strategy** to better protect communities along the lower Fraser River and coast – from Hope to Richmond and from Squamish to White Rock.

Partners in this inter-jurisdictional initiative have responsibilities or interests that relate to flood management: the Government of Canada, the Province of British Columbia, 25 local governments, and other entities in the region, including those focused on transportation systems, agriculture and business. The Fraser Basin Council serves as program manager and facilitator of the process.

The Flood Management Strategy will identify opportunities to strengthen flood management policies and practices as well as flood protection works across the Lower Mainland. An integrated, collaborative approach to flood protection is critically important, given the flood risks that Lower Mainland communities face and given that a major flood would have serious social, economic and environmental consequences for the entire region.

There are two phases to the strategy development. Phase 1 (2014-2015) will build a better understanding of flood hazards in the Lower Mainland, identify flood vulnerabilities across the region, and assess flood management practices and policies from a regional perspective. In Phase 2 (2016 forward), a strategy will be developed, based on the work from Phase 1, and will include options for funding and implementation.



# The Face of Flood in the Lower Mainland

*A recent study by the Province of BC indicates that the magnitude and frequency of large floods along the Fraser, from Hope to the river mouth, will significantly increase due to sea level rise and climate change. The report notes that, by the end of this century, a one in 50-year flood could be similar in magnitude to floods that currently have a return period of 200 or 500 years.*

– Simulating the Effects of Sea Level Rise and Climate Change on Fraser River Flood Scenarios (2014)

Most years there is flood, or risk of flood, somewhere in British Columbia. Communities in the Lower Mainland are vulnerable to both river and coastal flooding and related risks, such as erosion, landslides and tsunamis. The risks of catastrophic loss from a major flood are highest in the Lower Mainland because the region has a large population and significant infrastructure of regional, provincial and national importance situated in the floodplain.

The Fraser Valley and other parts of the Fraser Basin have experienced two major Fraser River floods of record, the largest in 1894 and the second largest in 1948.

Most of the flood protection works in place today were constructed by the federal-provincial Fraser River Flood Control Program between 1968 and 1995. Updated modelling on the Fraser River in 2006 revealed that dikes in the Lower Mainland were too low to protect against a Fraser River flood of record.

In 2007 the region faced a significant threat of flood during spring freshet. Communities gained access to provincial funding for dike upgrades and other urgent flood protection projects. While flood protection has been increased in specific Lower Mainland locations through this and subsequent investments, more work is required to address region-wide vulnerabilities.

Today there is evidence that flood hazards are changing as a result of sea level rise, storm surge, extreme rainfall and changes in river hydrology. In BC, the base sea level is projected to rise by about one metre by 2100, and possibly higher in the years that follow.

The Flood Management Strategy will allow authorities to stay current on the nature of the flood risk, identify the areas most vulnerable to flood, and take actions that are cost-effective and that protect the entire region.

## RISKS TO INFRASTRUCTURE

Critical infrastructure in the Lower Mainland is vulnerable to flooding. There are risks to ports, airports, highways, bridges, ferry terminals, oil and gas pipelines, as well as hydro-electricity, telecommunications, water and wastewater infrastructure.

Most Lower Mainland communities depend on common infrastructure. A large magnitude flood is therefore likely to affect a significant portion of the region's population (more than half of the BC population), directly or indirectly and disrupt local, regional, provincial and national economic activity.

Financial liabilities or hardship may also arise for government, the private sector, and residents related to disaster response and recovery.

*A major flood in the Lower Mainland is a threat to public health and safety, and could result in billions of dollars in damage to private and public property, loss of infrastructure and community services, disruption of business and trade, degradation of water quality and harmful environmental impacts.*



# Benefits of a Regional Flood Strategy

In 2013 the Fraser Basin Council undertook extensive consultations to ascertain interest in, and support for, a regional, collaborative approach to flood management in the Lower Mainland. Thanks to strong support and input, FBC prepared a business plan setting out the steps leading to a strategy.

The Lower Mainland Flood Management Strategy now has participation and support of the Government of Canada, the Province of BC, 25 local governments in the Lower Mainland and other regional interests: see page 4.

The development of a common strategy will help all Lower Mainland decision-makers identify and address knowledge gaps, identify priorities, coordinate efforts, avoid duplication, and ensure that flood protection strategies in one area will not have unintended adverse impacts for neighbouring communities. Recognizing that all communities are interdependent in the face of flood, the emphasis is on developing strategies that protect the entire region, including a plan to prioritize, fund and implement flood protection actions.

## KEY ELEMENTS OF THE STRATEGY

**Phase 1 (2014-2015) of the Lower Mainland Flood Management Strategy sets these priorities:**

- 1. Analysis of Multiple Flood Scenarios.** The project is analyzing a range of possible flood scenarios in the Lower Mainland and the projected water levels for each scenario to gain a more complete understanding of the risks.
- 2. Regional Assessment of Flood Vulnerabilities, Consequences and Costs.** The project is identifying the areas of greatest vulnerability to flood, and the impacts, consequences and overall costs of a catastrophic flood.
- 3. Effectiveness of Flood Protection, Policies and Plans.** The project is reviewing the condition of flood protection works and effectiveness of current flood-proofing measures, bylaws and floodplain management across the region. The focus is on opportunities for improvement, both at a local and regional level.

**Phase 2 (2016 forward) will develop a regional strategy and action plan, including recommendations for a secure, sustained funding model.**

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## PHASE 1 OUTCOMES

### 1. A better understanding of flood hazards

Decision-makers will benefit from a better understanding of a range of potential flood scenarios for the Lower Mainland now and in future. The project is using hydraulic modelling and technical analysis for these scenarios, considering both spring freshet and winter coastal flood risks, and taking into account different peak flows, sea level rise and storm surge events.

### 2. Identification of flood vulnerabilities across the region

Phase 1 work will also identify the social and economic consequences of a large flood event in the Lower Mainland. The aim is to help the responsible authorities better understand the benefits of investing in flood mitigation and to weigh priorities for that investment. Examples of impacts that will be assessed:

- Direct flood damages by sector (*e.g., residential, business, infrastructure, agriculture*)
- Economic losses associated flood damage and disruption of infrastructure
- Population displacement or other impacts on residents (*e.g., demand for emergency services, loss of critical utilities infrastructure and loss of access to employment*).

### 3. Regional assessment of current flood infrastructure, management practices and policies

The project will document and analyze current flood management practices and policies on a region-wide basis to help identify best practices and priorities for capital investments.



## Partners in the Lower Mainland Flood Management Strategy

as of July, 2014

Government of Canada

Province of BC:

- BC Ministry of Justice (Emergency Management BC)
- BC Ministry of Forests, Lands and Natural Resource Operations
- BC Ministry of Transportation and Infrastructure
- BC Ministry of Environment

Lower Mainland Local Governments:

- City of Abbotsford
- Village of Belcarra
- City of Burnaby
- City of Chilliwack
- City of Coquitlam
- Corporation of Delta
- Fraser Valley Regional District
- District of Hope
- District of Kent
- Township of Langley
- Village of Lions Bay
- District of Maple Ridge
- City of New Westminster
- City of North Vancouver
- District of North Vancouver
- City of Pitt Meadows
- City of Port Coquitlam
- City of Port Moody
- City of Richmond
- District of Squamish
- City of Surrey
- City of Vancouver
- Metro Vancouver
- District of West Vancouver
- City of White Rock

Other Entities:

- BC Agriculture Council
- BC Wharf Operators Association
- Canadian National Railway
- Canadian Pacific Railway
- Greater Vancouver Gateway Council
- Pacific Institute for Climate Solutions
- Port Metro Vancouver
- Simon Fraser University (ACT)
- TransLink
- Vancouver International Airport

## THE NEXT STEPS

The **Lower Mainland Flood Management Strategy** is an inter-jurisdictional, collaborative and integrated approach to flood management for all communities in the region.

Flood management is, in essence, risk management. The strategy will help decision-makers in all orders of government, together with those in other public and private sector entities, identify risks and vulnerabilities, develop effective policies and practices, and make optimal investments in flood protection works across the Lower Mainland.

The lessons learned and best practices that emerge from this strategy will also help other communities and regions in BC.

The Fraser Basin Council will make progress reports and a final report at the end of Phase 1 in 2015 on behalf of all partners in the initiative.

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Fraser Basin Council

*The Fraser Basin Council (FBC) is a charitable non-profit organization that brings people together to advance sustainability in the Fraser River Basin and across British Columbia.*