

## Flood Protection

### Description

Flood protection is a concern in British Columbia because many regions have extensive development in historical river floodplains. This development is important because it has historical significance, is located on valuable flat land, or is close to transportation on or near the water. Flooding can lead to loss of life, property and infrastructure. Protection, however, can be expensive, involving dyking, construction of habitable space above “flood control levels”, hazardous materials management, and other considerations.



*Source: City of Prince George*

### Status and Trends

Portions of Prince George are at risk. The City is located at the confluence of the Nechako and Fraser rivers, and a significant area of the City is within the floodplain. The Fraser River upstream of Prince George is about 32,000 km<sup>2</sup> while the drainage area of the Nechako is about 47,000 km<sup>2</sup>. These are large watersheds from which floods can be substantial and dangerous. Since 1917 there have been 51 ice jam events, the most recent in 2007/08.

Changes in future climate could affect the nature and severity of flooding in the future in Prince George. The Pacific Climate Impacts Consortium (PCIC) has predicted the annual Fraser Plateau region precipitation to rise overall by about 7 mm by the 2050s. A recent study by the PCIC for the Prince George region predicts mean temperature rises of 2-3 degrees C by 2041-2070. Warmer winter temperatures are expected to result in less snowpack, resulting in lower spring floods and earlier spring melt.

The potential flood risk to low lying areas of Prince George was assessed in detail after the 2007/2008 ice jam event.<sup>1</sup> This flood risk assessment reviewed the existing river conditions, developed an extensive flood model and examined alternatives for reduction of the flood risk from the Nechako and Fraser rivers. The study concluded that removal of gravel in flood-prone areas would not help, but that enlarging a key side-channel might reduce ice jam flood risk. Increasing existing dykes could be expensive and environmentally sensitive if dykes are not set back from the river to allow for protection of habitat.

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<sup>1</sup> [http://www.city.pg.bc.ca/city\\_services/emergency/icejam/doc/1%20Executive%20Summary.pdf](http://www.city.pg.bc.ca/city_services/emergency/icejam/doc/1%20Executive%20Summary.pdf)

## Performance Measurement

The following are ways Prince George could measure performance in this area:

- Area or value of developed land in the floodplain
- Area or value of developed land not adequately protected from anticipated floods

## Questions for Consideration

- **Flood Avoidance:** Should development in the future avoid flood prone areas such as floodplains?
- **Flood Protection:** What is needed to protect existing developments (dykes, gravel removal, flood proofing) in flood prone areas? Should any existing high risk areas be rezoned to a new land use (i.e. parkland and naturalization)? Should consideration be given to purchase or rezoning of the worst impacted areas into the future?
- **Stormwater and Habitat:** How can habitat protection and flood protection be achieved at the same time?
- **Transportation:** What are the risks to transportation infrastructure and what alternative routes are available?

## More Information

Prince George Flood Risk Evaluation Report

[http://www.city.pg.bc.ca/city\\_services/emergency/icejam/response/facts.php](http://www.city.pg.bc.ca/city_services/emergency/icejam/response/facts.php)

Emissions Scenarios Report IPCC, 2000

<http://www.ipcc.ch/ipccreports/sres/emission/index.php?idp=0>

4th Assessment Synthesis Report IPCC, 2007

[http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_report.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm)

[Climate Overview 2007: Hydro-climatology and Future Climate Impacts in British Columbia, PCIC](http://pacificclimate.org/docs/publications/PCIC.ClimateOverview.pdf) <http://pacificclimate.org/docs/publications/PCIC.ClimateOverview.pdf>