Provincial Flood Policies in British Columbia

Chloe Repka, Tatum Askew, An Duong, Morgan Game, Jasper Rye

REM 642
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Flooded path to a fishing area in Cheakamus IR 11 (Chua, 2021)

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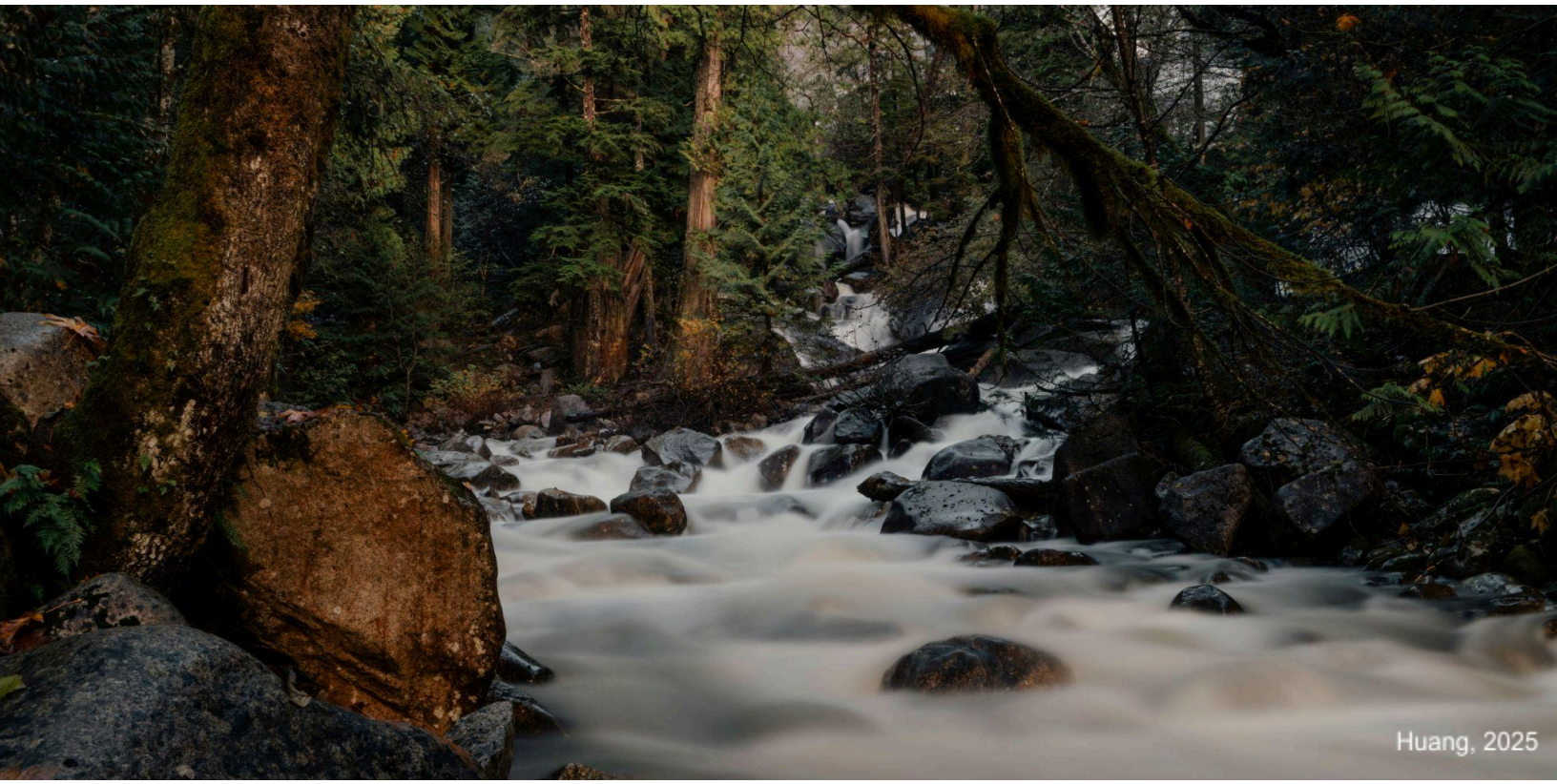


Introduction

Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) is experiencing increasing flood risk driven by climate change, altered flow regimes, aging infrastructure, and population growth. Given this risk, as well as recent flooding affecting the Nation, the Nation is seeking to reduce property-level flood exposure and build long-term flood management strategies supported by nature-based solutions (NbS). To achieve this, understanding the provincial policy context around flooding will be important for the Nation to plan for and implement flood risk management strategies.

This report aims to support the Sḵwx̱wú7mesh Emergency Planning and Response Team by summarizing our research on the current state of provincial flood risk management policy in British Columbia (BC).

Documents were collected on the BC government website, and chosen based on their inclusion of flood-related policies; the documents did not have to be targeted towards flooding specifically to be included (hence the inclusion of climate adaptation strategies, etc.). The documents were analyzed using the search function (Ctrl/Cmd+F) with the following terms: blue, coast, creek, first nation, flood, flow, Indigenous, natural hazard, rain, riparian, river, runoff, sea, shore, Squamish, storm, stream, and watershed.

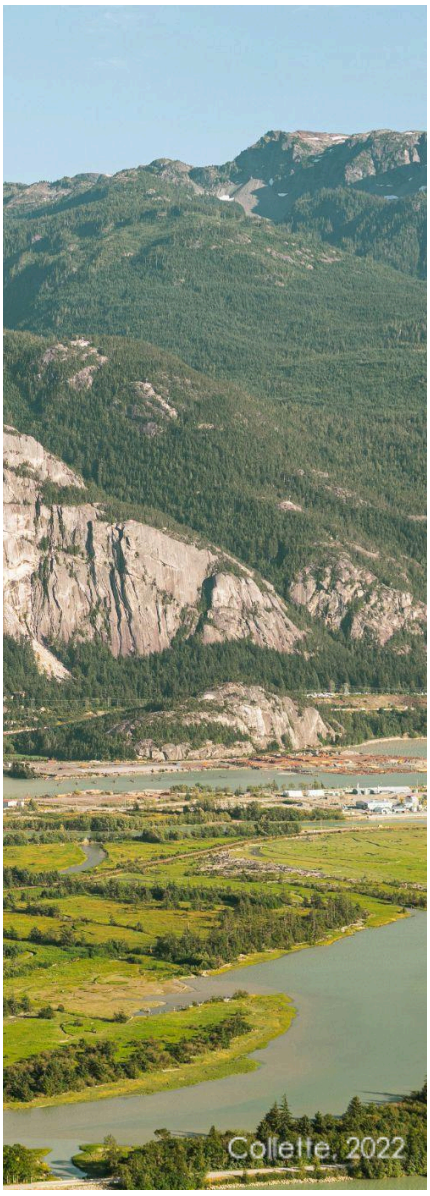
The document analysis and report are organized in the following order of categories:

- Adaptation
- Flooding (general)
- Flooding (riparian and coastal areas)
- Regional areas
- Professional guidelines and risk assessment
- Health
- Emergency management

The report begins with an overview of BC's overarching approach to climate adaptation management, which includes floods as a hazard, as this is the province's most high level policies for floor risk management. It then covers policies that are specifically targeted towards flooding (general flood policies and those focused on coastal and riparian areas). This is followed by smaller scale regional area plans (including land and resource management plans) as they pertain to flooding, and then professional guidelines and risk assessment for individual industries and professionals that must consider flood risk. Finally, the report covers the province's flood preparedness via its health and emergency management policies.

We identify four approaches related to flood-related disaster risk management, which we will use to identify the type of flood risk management used by the province:

1. **Prevention**: Activities and measures that avoid existing and new flood risks.
2. **Mitigation**: The lessening or limitation of the adverse impacts of floods.
3. **Transfer**: The process of formally or informally shifting the financial consequences of risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits.
4. **Preparedness**: The ability to effectively anticipate, respond to, and recover from the impacts of likely, imminent or current flood events or conditions.



Adaptation

This section identifies BC's key climate adaptation policies and programs, as they pertain to flood risk.

ClimateReadyBC | Floods

ClimateReadyBC is an online platform that aims to help the public and communities in the province to better understand disaster and climate risks through hazards and mapping tools, data, resources, and funding opportunities. It was launched in 2023 by the Ministry of Emergency Management and Climate Readiness, the Ministry of Environment and Climate Change Strategy, and the Ministry of Water, Land and Resource Stewardship, as part of the BC Climate Preparedness and Adaptation Strategy. It is also a hub for future collaboration and growth through engagement with First Nations, local governments, and other partners.

Floods are one of the eight hazards identified by ClimateReadyBC. The platform includes maps and tools that provide information on flood risk, past flooding events, and recent modeling studies to improve understanding of community vulnerabilities. These include the BC Flood Study Explorer, Flood Water Quality Monitoring Task Force Hub, Flood Debris Explorer, Flood Warnings and Advisories, and BC Lower Mainland Flood Information (FloodWise).

Additional resources include the Climate Change and Health in BC: From Risk to Resilience report, the Provincial Hydrology Program, Integrated Flood Hazard Management, guidelines on managing flooding and erosion at the watershed scale using NbS, and more. Relevant case studies include, for example, the Skidegate Coastal Vulnerability initiative which fosters climate adaptation and resilience through the Indigenous Coastal Climate Coalition.

Funding and investment opportunities include the BC Community Climate Guide, Disaster Risk Reduction Project Dashboard, Disaster Resilience and Innovation Funding Program, Community Emergency Preparedness Fund, LidarBC, Emergency Management Financial Supports, and more.

ClimateReadyBC can support Squamish Nation by providing a platform for the Nation to find relevant flood data, resources, and funding opportunities. As provincial tools and data are generalized, this must be paired with Squamish Nation-specific data, analysis, priorities, and values.

Spotlight of a relevant resource featured on the ClimateReadyBC platform:

Inventory of Streamflow in the South Coast and West Coast Regions (2017)

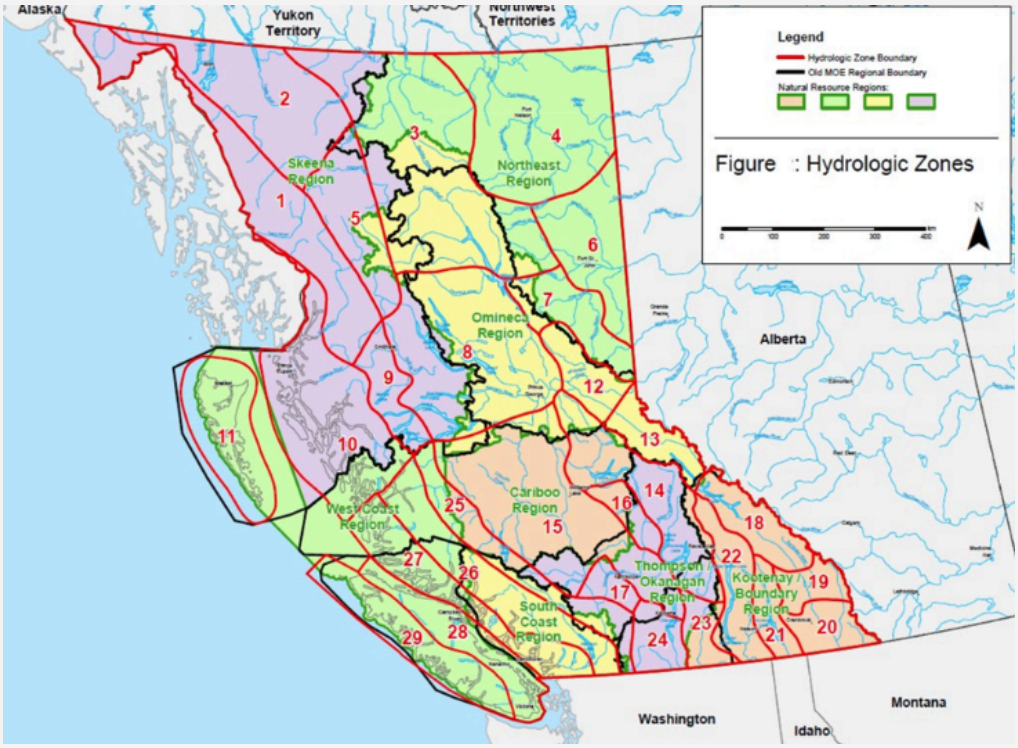


Figure 1: Hydrologic zones and natural resource regions in BC.

This report is part of the Provincial Hydrology Program. It updates the provincial streamflow inventory for BC's South Coast and West Coast regions, providing standardized statistics to estimate flows at both gauged and ungauged sites for water management and design. It is intended for preliminary hydrologic estimates for planning and design of water resource projects. It uses data up to 2013 and a 1981–2010 normal period, so it does not capture recent hydrologic changes (e.g., post-2013 extremes, ongoing climate shifts) that may be important for Squamish Nation. It is useful for Squamish Nation reserves in the Lower Mainland as a regional hydrologic reference rather than a site-specific design manual.

BC Climate Preparedness and Adaptation Strategy: Actions for 2022-2025

This strategy was launched in 2022 by the Ministry of Environment and Climate Change Strategy, as part of the CleanBC Roadmap to 2030. It outlines the province's actions to strengthen its capacity to anticipate, reduce, and manage climate risks (including floods), by addressing foundational needs for data, training and capacity to support First Nations and communities, local governments, business, and industry. It also works to ensure the knowledge and priorities of Indigenous Peoples are brought into decision-making while enhancing data collection, monitoring, and risk assessments to build a thorough understanding of climate impacts.

In its guiding principles, the strategy prioritizes: building a shared path to climate resilience with Indigenous Peoples, taking an equity-informed approach, and using NbS for community resilience (p. 13). Actions address the 15 climate risks identified in the province's Preliminary Strategic Climate Risk Assessment in 2019, where river flooding and coastal storm surge were identified as risks having severe consequences (p. 11).

These actions are grouped into four key pathways:

1. **Foundations for success: partnerships, knowledge, and decision-making.** This pathway emphasizes collaboration with Indigenous Peoples through partnerships, capacity-building projects, climate engagement, and an ongoing commitment to reconciliation (p. 24). It also supports climate data monitoring and forecast to measure variables such as streamflow and forecasting, as well as real-time information on flood and drought through BC's River Forecast Centre which analyzes snowpack, assess seasonal water supply, flood hazards, and streamflow conditions (p. 25).

2. **Safe and healthy communities.** This pathway supports community adaptation planning and implementation through the Community Emergency Preparedness Fund to enhance capacity of First Nations and local governments against risks including flooding and debris flow. It also supports the expansion of the Hazard, Risk and Vulnerability Analysis Toolkit (p. 32), the development of BC's Flood Strategy, and increased investments toward provincial floodplain mapping to provide communities with better baseline flood information (p. 35).

In addition, it supports Indigenous-led climate adaptation knowledge and capacity-building through the Indigenous Climate Research and Data Portal which includes climate change data, culturally appropriate climate change solutions, and opportunities to share lessons learned and wise practices with the province on how to integrate climate change, Indigenous ways of knowing and cultural interests into First Nations emergency management (p. 33).

3. **Resilient species and ecosystems.** This pathway focuses on watershed protection, which can support flood mitigation, through the Watershed Security Strategy and Fund (p. 40). It also focuses on revitalizing wild salmon populations through the BC Salmon Restoration and Innovation Fund (p. 42) and supports exploration of natural assets to enhance resilience to climate risks (although flood risk is not explicitly mentioned) (p. 43).

4. **Climate-ready economy and infrastructure.** This pathway highlights the province's efforts to support climate-ready infrastructure, buildings, and industry. For example, the replacement and rehabilitation of culverts in existing highway structures, geohazards research and assessment on resource roads that may be impacted by flooding, the Extreme Weather Preparedness for Agriculture program, and the Agricultural Water Infrastructure program which reduce vulnerabilities of farms from flooding and other hazards (pp. 46,48).

Flooding is one of the key climate hazards addressed by this high-level adaptation strategy, which mostly focuses on preparedness and mitigation. Although promotion of NbS is included as a guiding principle, it does not make an explicit link with flood risk management. The strategy does highlight the province's commitment to partnerships with Indigenous peoples. The scope of this strategy was to provide actions until 2025; it is unclear what comes next.

BC First Nations Climate Strategy and Action Plan (2022)

This plan was launched in 2022 by the First Nations Leadership Council, a collaborative working group including executives from the BC Assembly of First Nations, the First Nations Summit, and the Union of BC Indian Chiefs, funded by the BC Ministry of Environment and Climate Change Strategy. It is a province-wide, comprehensive framework to guide climate action for First Nations and assert Indigenous rights and title.

Inherent Title and Rights is the strategy's core pathway and supports First Nations climate action in meeting the outlined strategies and actions (see figure 2). Flooding, sea level rise, and king tides are among the key climate hazards identified. The plan contains one emergency response and preparedness action on flooding which enhances collaborative opportunities with the provincial and federal governments and First Nations organizations to implement an ecosystem-based approach such as NbS for flood management (p. 40).

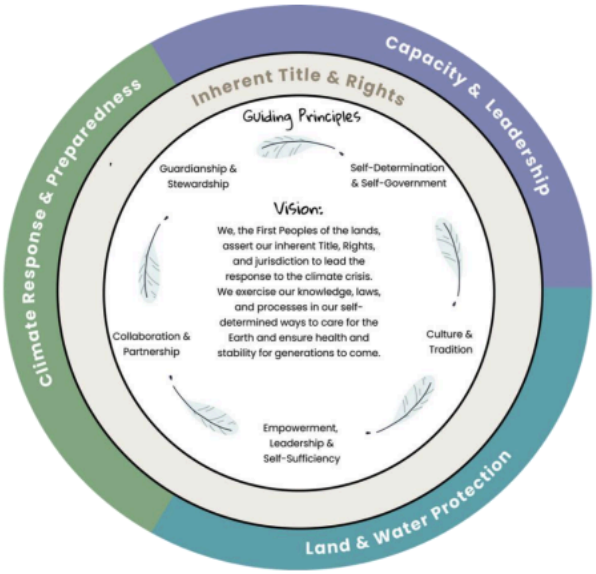


Figure 2: Visions, guiding principles, and pathways

BC's high-level adaptation policies are primarily contained within ClimateReadyBC and the BC Climate Preparedness and Resilience Strategy, which include flooding as a key climate risk. The BC First Nations Climate Strategy and Action Plan also considers flooding as a key climate risk, and provides an equivalent comprehensive plan for First Nations where these levels of actions can align. The next section summarizes the province's policies that are specifically targeted towards flood risk.

Flooding (General)

This section identifies BC's key policies and legislation that address flood risk directly.

From Flood Risk to Resilience: a B.C Flood Strategy to 2035 (2024)

This strategy provides guidance for First Nations and local governments to initiate and implement flood resilience planning. It was a multi-year project led by The Ministry of Water, Land and Resource Stewardship in collaboration with the Ministry of Forestry and the Ministry of Emergency Management and Climate Readiness. It focuses on preparing for climate change, meaningful Indigenous reconciliation, and reconciling our relationship with water, land, and flooding. It contains four pathways: understanding risk, strengthening flood governance, enhancing preparedness, response, and recovery, and investing in flood resilience. Each pathway holds many actions and resilience activities (pp. 22-23). The strategy is intended to work in tandem with the Watershed Security Strategy, Coastal Marine Strategy, Emergency and Disaster Management Act. It comprehensively addresses flood response and recovery, and flood preparedness and mitigation.

Following its 2020 launch, First Nations and local governments provided feedback and recommendations through the Summary of First Nations and Local Government Engagements on the BC Flood (FNLGE, 2022), the majority of which was then integrated into the strategy. Major barriers for implementing flood strategies were inter-jurisdictional and regulatory barriers, lack of provincial guidance, and insufficient communication, coordination, and relationship-building (p. ii). The finalized Strategy implemented, reviewed, and created new actions and resilience activities to address these barriers.

The main recommendations included uplifting Indigenous leaders in decision-making processes, which was addressed by creating the First Nations Flood Resilience Advisory Circle (p. 13). However, recommendations that moved beyond the Ministry of Water, Land and Resource Stewardship's purview were unaddressed, including the insurance industry (p. 11), dam and dike proponents (p. 59), and police forces (p. 59). The least integrated recommendation was increasing capacity, support, and funding to create "build back better" programs (p. 60). Table 1 provides a summary of the identified priority actions and non-addressed recommendations.

Table 1. Addressed and unaddressed recommendations from the First Nations and Local Governments Engagements on BC Flood. Only the most relevant action items are included.

Identified Actions	**Recommended actions and resilience activities left unaddressed**
Understanding Flood Risk ● Develop provincially coordinated floodplain mapping programs. ● Conduct province-wide risk assessment. ● Raise awareness of flood risk. ● Build support and capacity for advanced training and applied research.	***Understanding Flood Risk*** ● Collaborate with levels of government to advance development decisions and floodplain construction levels. ● Expand tsunami modelling. ● Liability protection rationale for those that release floodplain mapping, information, and data that has been publicized in good faith. ● Create a centralized hub for all relevant data to be accessible for First Nations and local governments. ● Provide guidelines and tools for communities to understand their flood risk for communities and property owners.
Strengthening Flood Risk Governance ● Create a First Nations Flood Resilience Advisory Circle and a Minister's Flood Advisory Circle. ● Promote integrated flood management. ● Update provincial legislation, policies, and regulations; technical guidance. ● Build international and cross-jurisdictional collaboration for flood resilience. ● Strengthen dike regulatory programs and develop a provincially-coordinated approach to address orphan dikes. ● Coordinate with forestry practices to reduce flood risk.	***Strengthening Flood Risk Governance*** ● Provide funding for communities to bring orphaned dikes up to current regulations. Though increasing provincial government capacity to address orphan dikes was implemented as an action item.

Enhancing Flood Preparedness, Response, and Recovery • Enhance flood preparedness and flood emergency responses through Provincial Flood Emergency Plan. • Improve pre- and post-disaster recovery planning.	***Enhancing Flood Preparedness, Response, and Recovery*** • Improve pre and post-disaster recovery planning with Build-back-better programs. Create new positions for Indigenous peoples in funding and coordinating, and well-being programs.
Investing in Flood Resilience • Increase and coordinated flood investments for avoidance, accommodation, protection, and community-led managed retreat. • Address loss of land for First Nations. • Develop predictable and long-term funding programs.	***Investing in Flood Resilience*** • Provinces should provide resources and facilitation services to start conversations on managed treat for Indigenous communities that will experience loss of land.

Climate Resources for Indigenous Communities (CIER) (2024)

This website is dedicated to supporting Indigenous communities pursuing climate mitigation and adaptation, by including toolkits, learning resources and training, youth resources, and climate action funding. Under toolkits, the Indigenous climate hub links to the First Nations Adapt Program, which includes flooding as a priority area for funding opportunities. It also links to Environment and Climate Change Canada and the Climate Change and Health Adaptation Program. In addition, CIER has a climate change adaptation planning toolkit for Indigenous communities, with the focus of building environmental capacity. However, this program does not directly list flooding. It holds five in-depth, step-by-step guidebooks from commencing to implementing watershed planning.

Under learning resources and training, the website Retooling climate change expands on various projects. The website includes many regional flooding adaptation resources, most have been covered in this report. The website also lists the Fraser Basin Council is taking action to strengthen regional capacity for climate adaptation flooding.

Flood Relief Act (RSBC 1996, continuously amended)

The Flood Relief Act details the Lieutenant Governor in Council's authority and municipal powers for flood control measures, including entering into agreements with other public authorities and levels of government for relief or rehabilitation of flood areas, conditions, and financial agreements. This includes establishing boards for flood areas by the Lieutenant Governor in Council, and outlines the report and auditing responsibilities, power to direct payment by the Lieutenant Governor and the power to make regulations.

Though this act primarily focuses on Lieutenant Governor in Council and municipalities authority, it could potentially be applicable if Squamish Nation is interested in creating a board for flood areas for collaborative water basin management.

Dike Maintenance Act (RSBC 1996, continuously amended)

This Act's objective is to outline the authority of the Inspector of Dikes and the Lieutenant Governor in Council's authority for the maintenance of existing and construction of new dikes. Several sections may have implications for Squamish Nation if dike upgrades, maintenance, or creation are desired in future. The construction, installation, alteration and implementation of new or existing dikes must have written approval by the inspector or in accordance with specific regulations. Similarly, without limiting the Inspector of Dikes authority, the Lieutenant Governor in Council has the authority to prescribe trust funds if the purpose includes the protection and restoration of the environment and the protection of private property from flooding.

A significant limitation to this Act is the failure to address orphan dikes where there is no established diking authority, though it appears this Act is likely to be updated given the new priorities outlined in *From Flood Risk to Resilience: a B.C Flood Strategy to 2035*.

Water Sustainability Act (2016, continuously amended)

The Act is divided into two sections: interpretation and the licensing, diversion, and use of water (LDU). The LDU mostly discusses grey infrastructure and agriculture for maintenance and reduction of flood risk; including applications, sensitive streams, expropriation of land by licenses, exemptions, changes in and about a stream, short-term water diversion for well drilling, and use of deep groundwater. Applications and expropriation of land by licensees may request for permit or appeal (respectively) for flood-related matters, and hold exemptions, such as authorized changes include the maintenance or removal of a bridge to allow for free passage of flood debris.
The Act also outlines declaring a local state of emergency from flood disasters, which allows for the clearing of obstruction of culverts or bridges if there is significant risk to public safety, private property, or the environment. Removal of beaver dams, if permitted under Wildlife Act, are allowed so long as erosion and downstream flooding do not occur.

A significant limitation, noted in *From Flood Risk to Resilience: a B.C Flood Strategy to 2035*, is the temporary and short-sighted nature of emergency responses and a lack of flexibility for long-term pressures. Also, First Nations are not included in the Local Government Act and therefore cannot complete low-risk in-stream work without prior authorization. This is significant and may pertain to the Squamish Nation.

The BC Flood Strategy to 2035 provides a provincial roadmap for First Nations and local governments to strengthen flood resilience through four pathways—understanding risk, improving governance, enhancing preparedness, and investing in long-term resilience—while aligning with other strategies like the Watershed Security and Coastal Marine frameworks. Developed collaboratively across ministries, it emphasizes Indigenous leadership and reconciliation but faces barriers such as fragmented jurisdiction, limited guidance, and funding gaps. Other resources like the CIER offer toolkits and training to build local adaptation capacity, including flood-related planning support. Legislation such as the Flood Relief Act, Dike Maintenance Act, and Water Sustainability Act establish legal authority for flood management but remain constrained by outdated provisions, particularly concerning orphan dikes, emergency response flexibility, and First Nations' water governance authority.

Flooding (Riparian and Coastal Areas)

Flooding in BC occurs across multiple interconnected systems, with coastal and riparian flooding representing two of the most significant and relevant hazard types for Squamish Nation. Coastal flooding is primarily driven by sea level rise, storm surge, and coastal erosion, all of which are being intensified by climate change. At the same time, riparian flooding occurs within river and stream systems, often influenced by changing precipitation patterns and watershed conditions such as land use and vegetation cover.

In response to these growing risks, provincial policies and guidance documents increasingly emphasize long-term preparation and mitigation tools including land-use planning, floodplain mapping, infrastructure design, and nature-based approaches. The following section summarizes key provincial resources related to coastal and riparian flood management, outlining how flooding is defined, addressed, and managed.

Riparian Areas

Riparian Areas Protection Act (SBC 1997, c 21)

This is a provincial statute of BC, current to March 24, 2026, that creates the legal authority for provincial directives and regulations protecting riparian areas in relation to residential, commercial, and industrial development under local government jurisdiction. The focus of the act is on riparian protection, fish habitat, and development regulations. Highlights include:

- **Section 12(1)** allows the Lieutenant Governor in Council to establish directives regarding protection and enhancement of riparian areas subject to residential, commercial, or industrial development.
- **Section 12(4)** requires local governments either to include riparian area protection provisions in zoning and land use bylaws or ensure their bylaws and permits provide protection comparable to or greater than the directive.

- **Section 13(2)(a)-(e.1)** authorizes regulations that can prohibit development unless prescribed requirements are met, require studies and assessment reports by qualified professionals, and tie methods/criteria to technical manuals.
- **Section 13.1** allows the minister to publish technical manuals for those assessment methods and criteria.

This document targets preparation and mitigation by embedding riparian protection into local government planning systems. This is a province wide act, though **section 12(3)** allows directives to differ for different parts of BC in different circumstances, meaning regional tailoring is possible.

Riparian Areas Protection Regulation (BC Reg 178/2019)

This is a provincial regulation under the Riparian Areas Protection Act, effective November 1, 2019, and last amended February 10, 2023. This regulation provides the operative regulatory framework for riparian assessments, development approvals, streamside protection and enhancement areas, assessment reports, and qualified environmental professionals.

Unlike the Act, this is a key operative instrument that describes what local governments and developers must do: where it applies, what counts as development, how riparian assessments are measured, what the riparian protection standard is, when assessments are required, and what assessment reports must contain, who can prepare them, and how local governments must cooperate on monitoring and enforcements. This regulation focuses on preparation and mitigation by defining protected riparian areas, regulating new developments, and setting approval conditions. This regulation is province-wide.

Riparian Areas Regulation Guidebook for Local Governments (2016)

This is a province-wide implementation guide for local governments prepared under the BC riparian regulatory framework, administered by the Ministry of Forests, Lands and Natural Resource Operations. This guidebook is focused on local government implementation to protect riparian fish habitat during development. The hazard focus is mainly riparian degradation, runoff, stormwater, wetlands, and related environmental risks. Highlights include:

- Legislative tools table for OCPs, DPAs, zoning, subdivision, development approval bylaws, and covenants (p. 6).
- Zoning setbacks and lot layout to protect riparian areas (pp. 10-11).
- Predetermined SPEAs and local area plans (pp. 24-25).

Although flooding is not the central focus, riparian protection contributes to flood mitigation by slowing runoff, increasing infiltration, and reducing peak flows. This document strongly supports preparation and mitigation of flood risk management by embedding these protections into land-use planning systems.

Lands Near Water: Riparian Restoration & Enhancement (2013, updated 2018)

This is a province-wide stewardship guide produced by the Stewardship Centre for BC for landowners, local governments, and stewardship groups on riparian restoration and enhancement near lakes, wetlands, and streams. It addresses flooding indirectly through its emphasis on ecosystem services. The document highlights that riparian areas contribute to flood control and water storage (p. 2) and erosion reduction and flow regulation (pp. 3-4)

Coastal Areas

BC Coastal Marine Strategy (website) (updated 2024)

This is a provincial strategy webpage which presents the province's shared vision for the BC coast to guide decisions over the next 20 years. The strategy supports biodiversity, productivity, resiliency, and the prosperity, health, and well-being of coastal communities, while balancing the needs of people and ecosystems.

The strategy is organized around four broad themes:

1. Healthy coastal marine ecosystems
2. Resilience to climate change
3. Thriving coastal economies and communities
4. Informed governance

A major emphasis of the webpage is co-development with First Nations. The province states that the strategy was co-developed with many First Nations across the coast, and that several First Nations and provincial staff formed a joint writing team to develop the policy intentions paper that helped set the direction of the strategy.

Highlighted projects in the BC Coastal Marine Strategy are presented below.

BC Coastal Marine Strategy (2024)

This is a provincial strategy co-developed with coastal First Nations, focused on long-term coastal management and climate resilience. Flooding is addressed within broader climate impacts, including:

- Sea level rise and extreme weather (pp. 33-37).
- Nature-based coastal protection (pp. 33-37).
- Improved planning and spatial data (pp. 50-59)

The strategy emphasizes preparation and systemic mitigation, particularly through ecosystem-based approaches and collaborative governance. Squamish Nation is explicitly listed as a contributor.

Coastal Marine Strategy Policy Intentions Paper (2022)

This is a provincial policy document from the BC Ministry of Water, Land and Resource Stewardship launching the strategy process with First Nations, local governments, and stakeholders. This is the pre-strategy discussion paper laying out the vision, outcomes, and 30 policy intentions. It identifies flooding-related hazards (pp. 2-3) such as:

- Sea level rise
- Coastal erosion
- Extreme weather events

It proposes actions to improve community safety, implement NbS, and build long-term resilience. The document is focused on preparation and mitigation at a policy level. While it does not explicitly reference Squamish Nation, it is part of a co-development process with First Nations and is relevant to coastal regions including the Salish Sea.

Coastal Marine Strategy What We Heard Report (2023)

This is a provincial engagement summary report prepared by the Ministry of Water, Land and Resource Stewardship. It summarizes stakeholder input gathered during the development of the Coastal Marine Strategy, including perspectives on climate change, coastal flooding, erosion, and cumulative impacts. Flooding is addressed as part of broader concerns about coastal resilience. Participants highlighted risks such as:

- Sea level rise and extreme weather events
- Shoreline hardening, seawalls, riprap, vessel traffic, and Port of Vancouver expansion (pp. 9-10).

The report reflects a strong emphasis on long-term mitigation and adaptation, including support for NbS and improved planning tools. While the report does not explicitly reference Squamish Nation, it includes participation from the Sea-to-Sky and Lower Mainland regions (p. 3), making it regionally relevant.

BC Adapts | Coastal Flood Management

The BC Adapts webpage is a provincial resource hub developed by the Government of BC that compiles key tools, reports, and guidance related to coastal flood management. The page focuses on hazards related to coastal flooding and is intended to support planners, local governments, and decision-makers working in coastal environments. The resources within it emphasize long-term preparation and mitigation through land-use planning, floodplain mapping, and shoreline adaptation strategies.

The following section provides summaries of the key coastal flood management resources identified on this webpage.

Coastal Floodplain Mapping: Guidelines and Specifications (2011)

This is a province-wide report providing technical mapping and engineering guidance from the Ministry of Forests, Lands and Natural Resource Operations. It is focused on producing coastal floodplain maps and flood construction levels (FCLs) in BC. It explains how to derive coastal FCLs, what topographic standards are needed, and how floodplain maps support land-use planning and bylaws, and includes a case study from Campbell River. Highlights include:

- Coastal floodplain maps which provide the technical basis for land-use planning and floodplain bylaws (p. i).
- Basic steps for coastal floodplain mapping (p. 2-1).

Sea Dike Guidelines (2011)

This is a province-wide technical guideline from the Ministry of Environment for diking authorities and design professionals on sea dike design under climate change and sea level rise. It provides technical design guidance for sea dikes, especially total water levels, crest elevations, and design environment under sea level rise. This is an engineering manual more than a policy document. These guidelines are relevant to mitigation and protection as they describe how to design or upgrade protective infrastructure before flooding happens.

Guidelines for Management of Coastal Flood Hazard Land Use (2011)

This is a province-wide guidance document produced by the Ministry of Environment. The document provides guidance for local governments, land-use managers, and approving officers on managing lands exposed to coastal flooding and sea level rise. The hazard focus is coastal flooding, sea level rise, storm surge, waves, and estuarine multi-hazard conditions.

The document provides a framework for integrating flood risk into land-use planning and development regulation. Key components include:

- Identification of sea level rise planning areas and flood hazard zones (pp. 11-18)
- Establishment of FCLs and setbacks to reduce risk (pp. 20-21)
- Use of land-use tools such as zoning, floodplain bylaws, and covenants (p. 20)
- Application of these tools to future conditions, including year-2100 flood scenarios (p. 21)

The document strongly emphasizes preparation and mitigation, particularly through the avoid–protect–accommodate–retreat framework. While emergency preparedness is mentioned, the primary focus is on reducing long-term flood exposure.

Greening Shorelines to Enhance Resilience (2014)

This is a technical study prepared for the Stewardship Centre for BC with support from Natural Resources Canada. The study focuses on evaluating shoreline adaptation strategies to address coastal flooding and erosion. The document compares traditional hard infrastructure (e.g., seawalls) with nature-based and hybrid approaches. Key examples include:

- Qualicum Beach seawall comparison (p. 25)
- Hybrid shoreline design at a residential site (pp. 21–22)
- Comparative performance of soft vs. hard approaches (pp. 29–30)

The study demonstrates that natural shoreline systems can reduce wave energy and flood impacts while improving ecological outcomes. The document is entirely focused on mitigation and adaptation. While the document does not reference Squamish Nation, it provides conceptually relevant approaches for coastal areas in BC.

Sea Level Rise Adaptation Primer (2013)

This primer is a provincial guidance document commissioned by the Ministry of Environment to support local governments in planning for coastal flooding associated with sea level rise, storm surge, and coastal erosion. It provides a comprehensive framework for understanding long-term flood risk and outlines adaptation strategies that can be integrated into land-use planning and infrastructure decisions.

The document identifies four primary adaptation approaches: protect, accommodate, retreat, and avoid (pp. 3–4). The strategies within them are intended to guide decision-makers in responding to increasing flood risk under future climate scenarios, particularly in low-lying coastal areas. The primer also emphasizes the importance of incorporating sea level rise projections into planning processes, highlighting the need to consider long-term projections (to 2100) when determining acceptable levels of risk and appropriate adaptation pathways.

The document is focused on preparation and mitigation, providing both policy and technical tools to reduce exposure to coastal flooding. It outlines a wide range of adaptation measures, including:

- Land use regulations (e.g., setbacks and zoning) (p. 28)
- FCLs (pp. 33,41,48,63)
- Structural protections such as dikes (pp. 64–67)
- Non-structural approaches like ecosystem-based adaptation and strategic retreat

Additional guidance on planning tools and implementation strategies is provided in the adaptation tools section (p. 28), which supports integration into municipal and regional planning frameworks. The primer explicitly notes that several First Nations communities, including Squamish Nation, are located in low-lying coastal areas vulnerable to sea level rise. Overall, the primer serves as a foundational resource for coastal flood management in BC.

[Cost of Adaption - Sea Dikes and Alternative Strategies](#) (2012)

This report includes high level estimates of the cost of different flood adaptation options to meet predicted sea level rise by 2100, in order to support planning and program development. It was developed by the Ministry of Forests, Lands, and Natural Resource Operations and funded by Natural Resources Canada. It covers 250km of the Metro Vancouver coastal shoreline and the Fraser River shoreline. Relevant shorelines to Squamish Nation include those of West Vancouver, District of North Vancouver, City of North Vancouver, and City of Vancouver (p. 2). A range of flood protection adaptation options were assessed for each shoreline reach. Options were divided into four groups (one structural group under the heading "Protect", and three non-structural groups under "Accommodate", "Retreat", and "Avoid" (p. 9).

The selected options for areas relevant to Squamish Nation included:

- dikes (City of West Vancouver, District and City of North Vancouver, and Kitsilano and English Bay)
- storm surge barriers (False Creek)
- flood proofing (Vancouver Burrard Inlet) (p. 11).

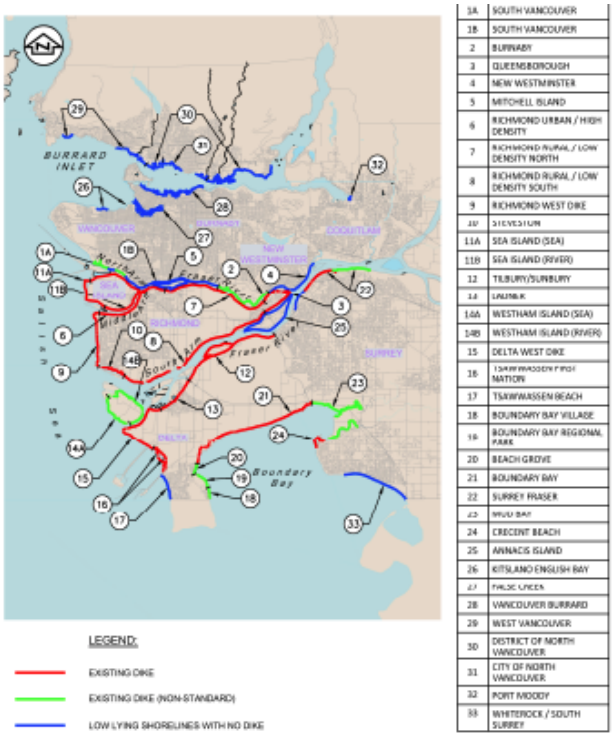


Figure 2. Shoreline reaches

Provincial policies and guidance documents related to coastal and riparian flooding demonstrate a strong emphasis on long-term preparation and mitigation, primarily through land-use planning, technical standards, and NbS approaches. While these frameworks provide a foundation for understanding and managing flood risk, they are largely implemented at a large scale. The next section summarizes the province's regional area plans that are relevant to Squamish Nation.

Regional Area Plans

This section analyzes the Sea to Sky Land and Resource Management Plan (LRMP) and its relevance to flooding, including the Province's land use planning agreements with Squamish Nation. It also examines how the Chilliwack, Sea to Sky, and Sunshine Coast Landscape Unit Plans interact with flood risk and management.

Land and Resource Management Plans

Sea to Sky LRMP (2008)

The Sea to Sky LRMP is a sub-regional land use plan that provides direction for future planning and management of natural resources. It was approved by the Minister of Agriculture and Lands in April 2008, after a five-year plan development process.

The Sea to Sky LRMP includes several watersheds in its geographic context, including the entirety of the Squamish River Watershed, the Lillooet River watershed down to Harrison Lake, the Gates and Indian River watersheds, and several other smaller waterways. When discussing the resource management direction for maintaining the functional integrity of floodplain ecosystems, it suggests measures/indicators to set a 20% target of maximum area available for timber harvesting within each of the five defined Floodplain Management Areas defined in the plan (Figure 3). In addition, it states a direction to implement the Sea-to-Sky Floodplain Management Plan, which is discussed below (pp. 47-48).

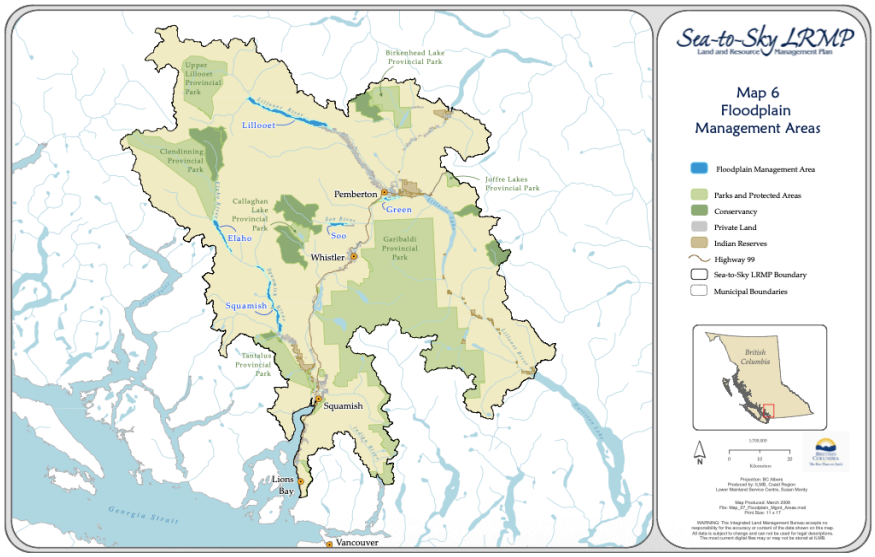


Figure 3: Sea to Sky LRMP Floodplain Management Areas

In addressing concerns related to grizzly bear populations, this plan recognizes the importance of protecting moist floodplain forests, a key foraging habitat. In grizzly recovery planning, it seeks to keep the reduction of productive forest land base below 5%, which will include the Floodplain Management Areas (Figure 3) (pp. 73-77).

The plan also guides the management of cultural areas, including reiterating its support for the protection of floodplains, by allowing no timber harvesting on the entire floodplain on the west side of the Squamish River within or adjacent to Estétiwilh/Westside Squamish River Cultural Management Area (p. 95).

In guiding resource management in wildland (mining/tourism permitted) zones, it states as an implementation direction for industrial development, that where a waterpower independent power producer is located near the edge of, but outside a wildland zone, some minor flooding by the impoundment reservoir may be permitted within the wildland zone if otherwise unavoidable (p. 104).

Sea–to–Sky LRMP Floodplain Management Plan (2010)

This plan was completed for the Crown portions of the Green, upper Lillooet, Soo, lower Elaho, and Squamish Rivers, and provides direction for land use professionals and managers in decision-making for operational activities. It was initiated as a result of recommendations from the public planning forum for the LRMP, and development of the plan included consultation and review with First Nations. The primary goals of the FMP are to conserve fisheries, wildlife, ecological and First Nations cultural values within the floodplain areas, and to ensure that tourism, recreation, forestry, agriculture, mining, power generation, and other industrial land uses are consistent with the plan.

In managing forestry in the floodplains, the FMP seeks to maintain the functional integrity of the floodplain ecosystems. It does so by limiting forest harvest area, retaining biodiversity and wildlife habitat types, limiting clearcutting, and re-stocking harvested areas with ecologically suitable species. The FMP also addresses cultural heritage values within the floodplains and aims to maintain opportunities for First Nations to carry out cultural uses. The strategies related to this goal are to maintain 100% of floodplain forested areas in Squamish Nation Síiyamín ta Skwxwú7mesh Cultural Sites, and manage the floodplain areas located in Squamish Nation úxwumixw Village Sites to protect cultural heritage values (pp. 7-8).

The FMP also outlines several objectives and management directions for key species, including moose, grizzly bears, bald eagles, fish and fish habitat, rare plants, and biodiversity as a whole, that depend on the floodplains for habitat. It also aims to limit access roads within the floodplain plan area and limit the impact on floodplains from recreation and tourism activities (pp. 9-12).

Sea-to-Sky LRMP Coordinated Access Management Plan (2009)

The Sea-to-Sky LRMP Coordinated Access Management Plan manages issues related to the use of existing and future road access to access-sensitive areas, and seeks to maintain road access to important recreation resources. The plan is primarily directed at cars and trucks using access roads, but it does recognize the impact of snowmobiles and all-terrain vehicles.

While the plan does not directly engage with flood management, it addresses the impacts of severe weather that can impact road access (landslides, washouts). For instance, the plan states that the Squamish Forest District is subject to extreme storms. As a result, gates are used on forest roads that can be locked to prevent access in the event of an emergency. For roads maintained at a "wilderness level," repairs for washout or road slumps are usually only undertaken for the prevention of environmental harm, or if safety is threatened. The plan also frequently refers to a major storm that occurred in 2003, which washed out bridges and resource roads.

The plan does briefly address specific landslide-prone areas, such as by allowing no parking along a portion of the Chance Creek forest service road within the Rubble Creek landslide hazard area. The plan also integrates access management concerning the protection of watersheds, such as by managing the Mashiter Creek and Stawamus River responsibly to maintain water quality and the timing and quantity of flow.

Agreement on Land Use Planning between the Squamish First Nation and the Province of BC (2007)

This document details the land use agreement between Squamish Nation and the Province of BC, represented by the Minister of Agriculture and Lands, for the directions and objectives of the Sea to Sky LRMP. Its core purpose is to protect the Kwékwayex Kwelháynexw ta Skwxwú7mesh Temixw (Wild Spirit Places). Three of these are covered: Nsíiyxnitem tl'a sútich (Upper Elaho Valley), Nexw Áyantsut (Sims Creek Watershed), and Estétiwilh (West Side Squamish River).

Key zones within these areas are established for different purposes. Conservancies are established as the zones with the highest protection, where industrial logging, mining, hydro-electric development, new roads and commercial development are prohibited. Wildland Zones prohibit commercial timber harvesting and hydro development, but other development is permitted if consistent with the protection of wildlife habitat values. Lastly, Special Cultural Management Areas allow timber harvesting that is managed according to strict guidelines.

The agreement also protects 22 cultural sites and 3 village sites managed as Síiyamin ta Skwxwú7mesh Cultural Sites and Uxwumixw Village Sites, introduces wildlife management collaboration strategies, implements commercial recreation zoning that reflects Squamish Nation interests, and establishes a dispute resolution process.

Squamish Nation Land Use Planning Agreement (Phase 2) (2025)

The phase 2 agreement between Squamish Nation and the Province of BC, represented by the Minister of Forests and the Minister of Water, Land and Resource Stewardship, is an update to the 2007 agreement. The 2007 agreement left many Squamish Nation interests unresolved, including Cultural Training Areas, Wild Spirit Places, and Wildlife Focus Areas, in a land-use zone called "Area subject to further discussion."

Phase 2 introduces 33 new Siiyamin ta Skwx̱wú7mesh (Cultural) Sites and six Special Cultural Management Areas, including new management directions for forestry reflecting Squamish cultural values. In addition, outstanding Squamish Nation Land Use Planning (SNLUP) areas from the 2007 agreement are addressed here through formal

notations of interest. The Province also commits to applying mineral reserves over Phase 2 Siiyamin Sites. Lastly, elements not present in the 2007 agreement include marine and Foreshore Area commitments, support for a Squamish-led forest carbon offset project, and Crown Land Development Areas. The marine or Foreshore Area commitments open the door for Squamish Nation participation, including with the federal government, on marine planning discussions. Second, they engage Squamish Nation in a government-to-government process to discuss and seek agreement on amendments to current provincial policies for land tenuring and permitting in Marine Foreshore areas within Areas of Importance. Third, they commit to working with Squamish Nation to identify priority Marine Foreshore areas and recommend them to be withdrawn from disposition under section 16 or 17 of the Land Act.

Landscape Unit Plans

Chilliwack, Sea to Sky, & Sunshine Coast

Landscape Unit Plans in the Chilliwack, Sea to Sky, and Sunshine Coast Natural Resource Districts were analyzed for their integration of flood management and related topics, including riparian management, terrain stability, and old growth management. Over 65 landscape units have been identified between the three regions. However, for simplicity, only the plans that overlap with Squamish Nation reserves were included in the analysis. Additionally, some landscape units that overlap with Squamish Nation reserves have yet to receive a landscape unit plan, and are thus not included.

Title and Year of Adoption	Plan's Interaction with Flooding and Related Topics
Lower Fraser Sustainable Resource Management Plan (2013)	Identifies specific stands within old-growth management areas (OGMA) with riparian and floodplain attributes as primary candidates for protection. Discusses riparian management zones adjacent to fish-bearing waterways to maintain fish habitat.
East Howe Landscape Unit Plan (2003)	Includes floodplains, deltas, and estuaries as areas with "special habitat features" in its ecological value scoring within OGMAs. Considers terrain stability in OGMA selection by designating areas as fragile or with unstable soils. OGMAs are delineated within riparian reserve zones, providing multiple benefits.
Landscape Unit Plan for Old-Growth Management Areas - Mamquam (2014)	Co-locates OGMAs with environmentally-sensative areas, riparian management areas and stands within floodplains. Soil stability is included in the plan's definition for operability of timber harvesting, passively preventing slide hazards.

Lower Squamish Landscape Unit Plan (2003)	Includes floodplains, deltas, and estuaries as areas with "special habitat features" in its ecological value scoring within OGMAs. Co-locates OGMAs with known fisheries sensitive zone values (floodplain offchannel fish habitats) and stream riparian and lake riparian corridors.
Chapman Landscape Unit Plan (2002)	Significant portions of existing OGMAs are located within riparian reserve zones, where timber harvesting is restricted. Inoperable harvesting land is included in the OGMAs due to poor slope stability and steep terrain. Emphasizes protecting OGMAs within community watersheds, offering multi benefits, such as flow regulation in drainage areas, watershed health, and soil stability.
Howe Sustainable Resource Management Plan (2012)	Special attention was paid to riparian OGMAs and expanding their connectivity to include adjacent upland forest. Narrow and isolated riparian corridors were not considered viable OGMA candidates because of their limited landscape scale value. Some OGMA boundaries were mapped to natural features, including streams and slides.

Instead of direct flood mitigation strategies, flood management in regional area plans uses land-use directions restricting industrial activities in floodplain areas. Squamish Nation is involved through government-to-government agreements controlling industry within Cultural Training Areas, Wild Spirit Places, Wildlife Focus Areas, among others.

Professional Guidelines and Risk Assessments

This section summarizes professional guidelines and risk assessments developed by the province and its regulatory/industry bodies as they relate to flood risk management.

Legislated Flood Assessments in a Changing Climate in BC: Professional Practice Guidelines (2018)

This document provides professional practice guidelines to ensure that flood assessments in BC meet regulatory requirements. It was prepared by Engineers and Geoscientists BC and commissioned by the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development. The guidelines explain how flood assessments in BC evaluate flood hazards, establish flood levels, and guide land-use planning and infrastructure design to reduce community risk. They emphasize the role of dikes, noting that assessments must consider their potential failure when estimating flood risk and setting FCLs. These assessments are closely tied to provincial legislation, particularly the Water Sustainability Act and the Dike Maintenance Act. It outlines key data sources and analytical considerations for incorporating climate change projections (s. 3.4), and describes how climate change may increase the frequency and intensity of flooding (Appendix G).

The guidelines note that First Nations can act as Approving Authorities for development proposals and that structural mitigation works must demonstrate consultation with First Nations where applicable. Works on reserve lands are owned and operated by First Nations. It references the Fraser River Flood Control Agreement, under which some dike projects on First Nations reserves were not pursued due to insufficient quantified benefits. It states that flood mitigation infrastructure on First Nations lands has limited access to standard funding (often requiring project-by-project approval through Indigenous and Northern Affairs Canada), but may receive emergency funding when needed. It also states that flood mitigation measures can provide important social and cultural benefits that are not easily captured in traditional cost-benefit analyses.

Flood Hazard Area Land Use Management Guidelines (2004; amended 2011, 2018)

This document was developed in 2004 by what was then called the Ministry of Water, Land and Air Protection. Its goals are to reduce or prevent injury, human trauma and loss of life, and to minimize property damage during flooding events. It promotes land use regulation as the "most practical and cost effective way" of achieving these goals. The guidelines support development and implementation of land-use management plans and make subdivision approval decisions for flood hazard areas. There are also guidelines for flood plain mapping, different hazard types (e.g., lakes, watercourses, etc.), land uses (agriculture, fish farms, etc.), and implementation measures (manufactured homes or units, depth of flooding, etc.).

Guidance for Selection of Qualified Professionals and Preparation of Flood Hazard Assessment Reports (2004)

This guide provides direction on how to select appropriate qualified professionals (QPs), such as engineers or geoscientists, and how to put together flood hazard assessment reports. It was prepared by the Ministry of Water, Land and Air Protection as part of the Flood Hazard Area Land Use Management Guidelines (see above).

The document states that QPs should have relevant experience in areas such as river engineering and hydrology and should submit a written proposal outlining their qualifications and the scope of work (p. 2). Flood hazard assessment reports are expected to include key elements such as a location map, legal description of the property, site conditions, and assessment methods, etc. (p. 3). The guide focuses primarily on technical and professional requirements and does not mention collaboration or consultation with First Nations communities.

Flood Mapping in BC: Professional Practice Guidelines (2017)

These guidelines were developed by Professional Engineers and Scientists of BC in conjunction with the Ministry of Transportation and Infrastructure – Emergency Management BC to ensure consistency in the preparation of flood maps across the province. In the Squamish Integrated Flood Hazard Management Plan case study (p. 43), the District of Squamish's flood hazards were assessed using hydraulic and hazard modelling for multiple rivers (Squamish, Mamquam, Cheakamus, Cheekeye, and Stawamus) and coastal influences from Howe Sound under future conditions including sea level rise. The study produced inundation and hazard maps showing coastal and river flooding extents, evaluated physical, social and economic consequences, and modelled dike breach scenarios to inform long-term flood mitigation, risk-informed planning, and design FCLs for community resilience. The guideline, however, does not describe collaboration with Indigenous communities, beyond acknowledging their participation as members of the Fraser Basin Council or potential as a client.

The professional guidelines and risk assessments relevant to flood are primarily performed by consulting groups such as Engineers and Geoscientists BC. These documents outline standardized methods for flood mapping, flood risk assessment and the selection of professionals to carry out these works. The next section summarizes the provincial documents pertaining to emergency management.

Emergency Management

This section reviews provincial documents and websites related to the emergency management of flood events.

Government's Action Plan: Responding to wildfire and flood risks (2018)

This action plan outlines how the province will adapt to flood risk and implement recommendations from Addressing the New Normal: 21st Century Disaster Management in BC (an independent report evaluating BC's response to the 2017 wildfire and flood season). It was developed by Emergency Management BC and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development. Its purpose is to improve emergency management in BC through actions such as better integration across ministries, stronger First Nations emergency management, improved public communication, upgraded tools and operations, and a more coordinated recovery framework.

It includes 108 recommendations for addressing flood risk, which are attributable to either the provincial government, federal government, or First Nations. Its key priorities and principles emphasize reconciliation efforts, principles of shared responsibility for preparedness and emergency management, a holistic approach that balances multiple values, respect and use of local and traditional knowledge, and mitigation and recovery in emergency management. It also emphasizes working with First Nations from the beginning and throughout emergency management, rather than treating them as after-the-fact stakeholders.

Emergency and Disaster Management Act (EDMA) (2023)

The EDMA provides a modern legal framework to coordinate all phases of emergency management; mitigation, preparedness, response and recovery while clarifying roles and responsibilities of actors. Part 3 of the Act recognizes Indigenous governing bodies as legitimate decision makers in emergency management. Other key actors in the act include: the Minister, provincial emergency management organizations, local authorities, and volunteers.

The EDMA is designed to align with the Declaration on the Rights of Indigenous Peoples Act (DRIPA). This enables agreements between First Nations and the province to coordinate emergency powers, planning and response. The act mandates that local authority must consult and cooperate with Indigenous people in addition to including Indigenous knowledge in risk assessments and or emergency plans where available. Emergency plans and preparedness is emphasized for hazards, but it is important to note that the act does not explicitly mention flooding events.

Emergency and Disaster Management Regulation (EDMR) (2023, amended 2024)

The EDMR establishes specific requirements for risk assessments, coordinated emergency planning, hazard identification (including floods), and public warning systems. It explicitly recognizes treaty areas, meaning emergency planning must consider Indigenous jurisdictions and lands (section 3.1). The regulation formally identifies flood as a key hazard including riverine flooding, debris flows and coastal flooding under the dike maintenance act. It requires ministers to conduct risk assessments for flooding and evaluate how they interact with other risks and the potential impacts on food and water security. A coordinated emergency management plan must be created to prepare, respond and recover from disasters such as floods. The regulation also emphasizes the importance of public warning systems to notify the public of emergencies.

Compensation and Disaster Financial Assistance Regulation (1995, amended 2025)

This regulation explains who can get financial aid and what costs are covered following disasters and emergencies. It states that infrastructure built within a designated floodplain is not eligible for financial assistance after a flood unless it has been deemed adequately protected (Division 3, s.15). Publicly owned protective structures, such as dikes and levees, may be eligible for funding; however, support is limited to restoring them to their pre-disaster condition. In addition, under personal expenses, certain protective works, such as measures to prevent bank erosion, may be eligible (Schedule 1). The regulation does not explicitly reference Indigenous peoples or First Nations.

Emergency and Disaster Management Act Interim Guidance on Indigenous Engagement Requirements (2025)

This guide provides direction for how government and planners should meaningfully consult and collaborate with Indigenous communities during emergency events. It was prepared by the Ministry of Emergency Management and Climate Readiness.

This document has minimal explicit mentions of flood events and instead serves as a guide outlining how the government and relevant entities must work collaboratively with Indigenous governing bodies (IGB) under the EDMA. It lays out a Distinctions Based Approach which recognizes that First Nations, Metis and Inuit peoples as distinct groups requiring tailored engagement to ensure that processes are respectful and relevant to each group. The requirement guide is based on three forms of engagement:

- Consult and Cooperate (pp. 16-22): "Free, prior and informed consent", as stated in the UN Declaration. IGBs are not required to participate but must be given the opportunity.
- Engage and Cooperate (p. 23): Used in acute or severe situations where full consultation is not feasible
- Consult and Coordinate (p. 23): Focuses on information sharing and alignment of actions between parties when developing risk assessments.

This document acknowledges power imbalances in emergency management and strives to promote cultural safety in interactions with IGBs. It also emphasizes the importance of incorporating Indigenous knowledge such as topics of natural resource management, agriculture and health into planning and risk assessment methods.

Disaster Recovery Guide for Indigenous governing bodies and local authorities (2025)

This guide is designed to help IGBs and local authorities plan, coordinate and carry out post disaster recovery efforts. This includes immediate and long-term actions for events such as floods. It was prepared by the Ministry of Emergency Management and Climate Readiness.

Cultural safety is a key pillar of emergency management, as highlighted in Section 2.2, and is further supported by the Emergency Management Assistance Program (EMAP), which provides funding for First Nations communities to prepare for and respond to natural hazards. Disaster recovery is closely tied to mental and social well-being, especially for Indigenous communities, and this connection must be recognized in recovery planning. The First Nations Health Authority (FHNA) also provides health related emergency support to communities affected by disasters (p. 12).

Planning tools such as Official Community Plans and zoning bylaws can enhance community resilience and reduce risk when they are informed by up-to-date climate and hazard assessments (p. 54). When removing flood protection assets, several considerations are important: whether materials such as sandbags are contaminated, who is responsible for managing these assets, and whether they have been buried by debris or displaced into waterways (p. 61). Together, these considerations help ensure that flood recovery actions are carried out safely and effectively.

BC Disaster and Climate Risks and Resilience Assessment (DCRRA) (2025)

This assessment provides a comprehensive evaluation of BC's exposure to major natural and climate related hazards and the resilience of communities by drawing on climate projection datasets (pp. 11-32). The document collaborated with an Indigenous owned planning company (Sanala Planning) and was developed by a large multidisciplinary team of consultants and experts. It was primarily led by the Ministry of Emergency Management and Climate Readiness. This assessment aligns with the Sendai Framework for Disaster Risk Reduction and reflects the legislative requirements of the EDMA.

It notes that historically, most flooding in BC has been driven by spring snowmelt, while in the southwest of the province, intense rainfall from atmospheric rivers is a primary contributor. First Nations are among the most affected populations, largely due to colonial land policies that confined many communities to high-risk areas such as floodplains. Drawing on their traditional knowledge of these landscapes, the assessment emphasizes the importance of greater awareness and respect for natural flood cycles. In addition to direct impacts, riverine flooding can also trigger secondary hazards, including debris flows, bank erosion, and sediment deposition (pp. 32-54).

The geospatial analysis conducted identifies Indigenous people as a population at high risk of impacts from coastal flooding, which will be further exacerbated by climate change. Rising sea levels, storm surges, and increased frequency of extreme weather events are expected to intensify these risks, threatening housing, infrastructure, and culturally important sites in coastal communities. In both the cases of coastal and riverine flooding, incomplete and insufficiently detailed flood hazard mapping for many First Nations communities is identified as a key limitation, reducing the accuracy of flood risk assessments in these regions (pp. 54-65).

The Fraser River flood case study describes a large-scale riverine flood scenario that would impact many First Nations communities. A combination of rapid snowmelt and heavy rainfall was shown to overwhelm rivers and dike systems leading to flooding. First Nations are highlighted as particularly vulnerable due to their location along the river, including communities that rely on fishing and river access. The case study also highlights impacts beyond physical damage such as disruption of housing and access to culturally significant lands. It further notes that early decision making may lack adequate consultation with First Nations causing mistrust between communities, the province and local authorities (pp. 8-20).

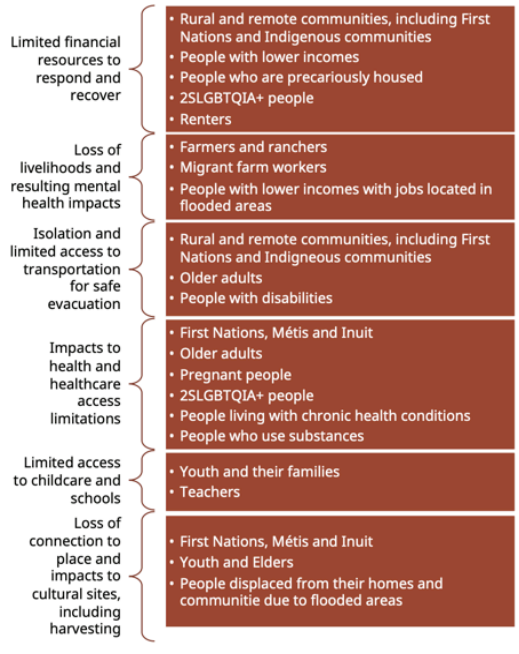


Figure 4: Groups that are disproportionately impacted by riverine and coastal flood events.

Flood Preparedness Guide (2025)

This guide is found within PreparedBC and helps residents understand how to prepare for a flood and what to do if one occurs. It suggests that residents within the same household choose an emergency meeting spot and keep a list of contacts they can reach out to for help . Residents are also encouraged to know where to find reliable information, prepare grab-and-go bags with essential items, research insurance coverage, and protect their homes by taking steps such as clearing storm drains.

Flood advisories are issued by the River Forecast Centre and include three levels: High Streamflow Advisory, Flood Watch, and Flood Warning. There are also three stages of evacuation: Evacuation Alert, Evacuation Order, and Evacuation Rescinded. The guide additionally provides steps and tips for safely returning home following a flood (p. 19).

Provincial Flood Emergency Plan (2019)

This plan defines the roles and responsibilities of First Nations, provincial ministries and local authorities before, during, and after flood events. The four pillars are mitigation, preparedness, response and recovery. Key considerations in terms of equitable support for First Nations include:

- Indigenous Traditional Knowledge as a unique and essential component in flood management
- First Nations are disproportionately impacted by emergencies
- The history of colonialism and lived experiences may contribute to a lack of trust in current practices and institutions

A list of authorities and agreements are found in section 2 (pp. 8-10). Certain acts are covered in this provincial assessment (Emergency Program Management Regulation, Water Sustainability Act, Dike Maintenance Act, etc.). As defined by the plan, floods are considered hazardous when they have the potential to cause harm. The intensity and frequency of flood events are likely to increase due to climate change. Furthermore, there is pressure to develop which can result in more severe damages if on a flood plain. Below is a list of key flood risks and considerations as well as resource requirements for ministries to support planning (pp. 10-11).

Risk and Considerations	Resource Requirements
Climate change may increase events without notice	GIS staff, mapping tools
Compromised sewage systems can result in public health risk	Aviation resources to survey and plan
Dam owners/dike authorities are required to actively ensure that their infrastructure is are operational	Water barriers such as sandbags and temporary berms

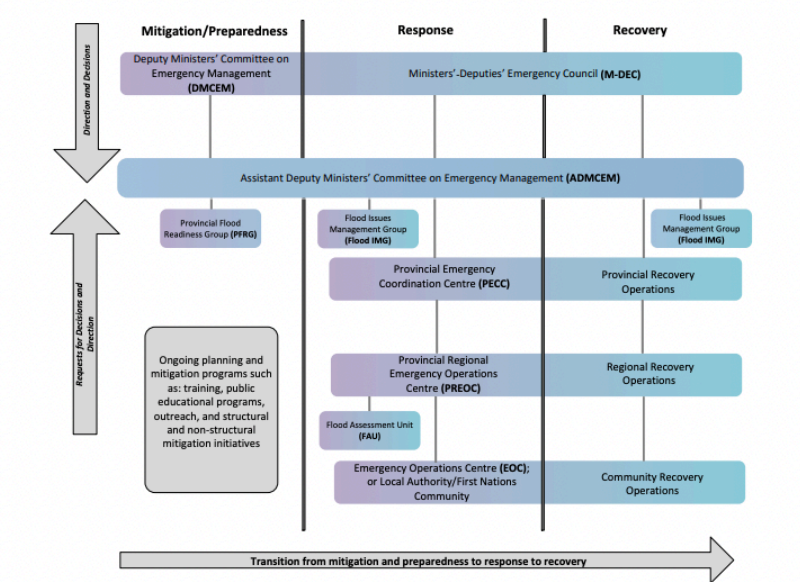


Figure 5: Actors and agencies involved across levels of emergency management

For a full list and detailed explanation of actors involved in the provincial coordination see section 5 (pp. 14-22). Refer to section 6 for a full description of roles and responsibilities of ministries and First Nations and section 7 for external agencies (pp. 22-31, pp. 31-34). The table below provides a summary of First Nations key roles and responsibilities within each of the pillars (Appendix A, p. 36).

Mitigation	Preparedness	Response	Recovery
Conduct a hazard, risk, vulnerability analysis	Create an emergency flood plan	Activate the EOC and local emergency plan	Remove sandbags and have a plan for debris removal
Assess impacts on infrastructure, services, vulnerable populations	Designate a spot to be an Emergency Operations Center (EOC)	Issue evacuation orders and coordinate if necessary	Make sure the community is safe for residents to return
Fix potential issues with dikes, dams	Communicate with appropriate actors to coordinate mitigation efforts	Prepare relevant reports (financial, situation etc.)I	Do a quick assessment of the damage
Apply for funding	If appropriate; livestock producers may need to prepare for animal care and emergency management (insurance)	Carry out flood protection measures	Set up a community resilience center

First Nations' Emergency Services Society of BC (FNESS)

This website empowers First Nations communities by providing training, mentorship and resources to help prepare for, response to and recover from disasters.

FNESS is based on the four pillars of emergency management: mitigation, preparation, response, recovery. The team encourages communities to reach out proactively for support and inquiries.

- Mitigation: This team appears to be primarily focused on reducing wildfire risks at this stage, with only a single mention of flooding as a potential increased risk due to secondary impacts on land stability following fires.
- Preparedness & Recovery: The program provides training, planning tools, and mentorship to support the development of emergency and recovery plans, helping leaders respond more effectively during disasters. It also assists communities in navigating funding and recovery programs following a crisis.

- Response: The FNESS All Hazard Response program helps First Nations response to emergencies such as floods and build capacity to manage these events independently. The 2021 flood response video on the page shares lessons and experiences to help communities improve preparedness and strengthen response strategies.

Ministry of Emergency Management and Climate Readiness

This website provides information about the Ministry of Emergency Management and Climate Readiness which coordinates BC's efforts to prepare for, respond to, and recover from emergency disasters with a goal of reducing climate related risks in the province. Below is a summary list of resources and hyperlinks which are accessible from the website:

- EmergencyInfoBC: Provides 24 hour updated and verified information regarding current emergencies in BC. The River Forecast Centre serves as the primary source for provincial flood advisories and warnings.
- Emergency Alerts: Explains BC's emergency alert system and provides information on how alerts are issued to the public. EmergencyInfoBC should still be referred to for up to date information.
- PreparedBC: Includes resources and guides to help individuals and communities prepare for emergencies, and respond to and recover from disasters. Examples include a checklist for a "grab and go bag".
- Emergency Management: Provides information on BC's emergency management system such as policies, programs and resources for preparedness, response, recovery, and disaster risk reduction.
- Disaster Mitigation Programs: Provides a list of resources related to flooding mitigation within the "Professional Practice Guidelines" section.
- Financial Assistance: Includes application process, eligibility criteria, determination process and contact information for the Disaster Financial Assistance program.
- Emergency Response Volunteers: Explains role of volunteers in BC's emergency management system and provides information on opportunities for people to support local emergency response efforts.

The All-Hazard Plan (2012)

This plan was developed by Emergency Management BC and provides a framework that guides emergency and disaster response in the province. It identifies two main flood seasons: fall and spring, caused by heavy rainfall and snowmelt. The Ministry of Transportation and Infrastructure and the Ministry of Forests, Lands and Natural Resource Operations are identified as technical leads for flooding (pp. 18-20). Flood Safety is a key agency within the latter ministry, along with the River Forecast Centre, which provides flood forecasts.

First Nations with treaty agreements are treated similarly to local authorities in that they hold the main responsibility for emergency planning, response, and recovery within their jurisdiction. The document states that the primary federal link is Indigenous and Northern Affairs Canada who holds legislated responsibility for emergency management on First Nations reserves. However, the plan does not specifically mention impacts on Squamish Nation, nor does it provide specific directives for measures to mitigate, prepare for, respond to, or recover from floods. Instead, it serves as a general framework outlining hazards and the responsibilities of different agencies and jurisdictions.

Emergency Operations Centre (EOC): Operational Guidelines (2008, modified 2023)

This document provides a structured and standardized guideline for local governments in BC on how to establish, organize and operate an EOC to coordinate response and recovery. EOCs act as a central communication and coordination hub during emergencies, ensuring that multiple agencies and departments can work together effectively. The guidelines describe three potential levels of EOC activation depending on the scale and complexity of the emergency. Within this framework, a flood is considered an event, while related consequences, such as water contamination, infrastructure damage, or evacuations are treated as incidents occurring within the broader flood event.

The document makes limited direct reference to First Nations communities. First Nations are mentioned once within the Information Officer position checklist, which notes that the officer should establish and maintain a list of First Nations groups during the operational phase to ensure that public information and updates are distributed appropriately. Despite this limited mention, the document provides clear and detailed direction of how to operate an EOC during emergency events.

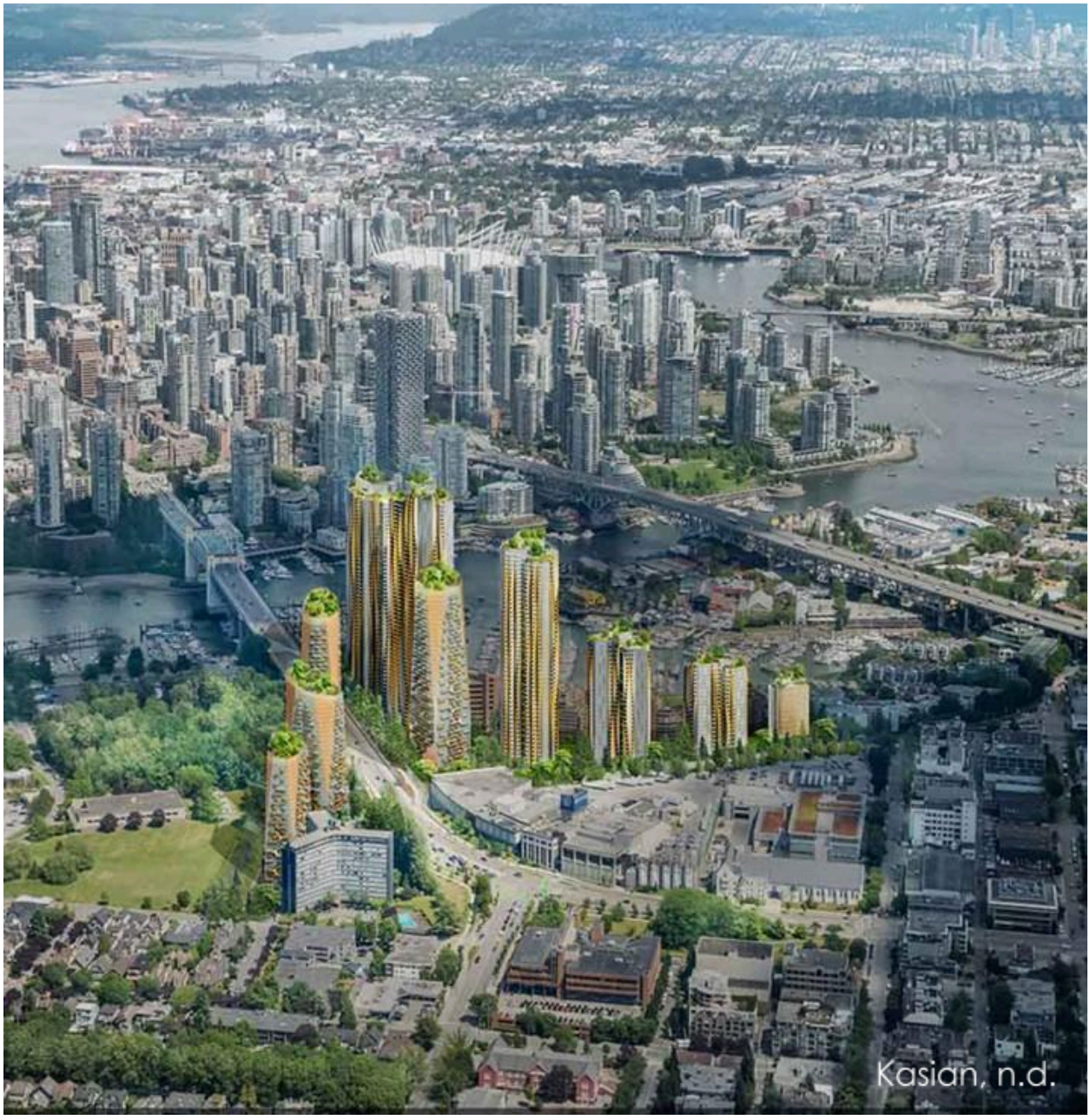
BC Emergency Management System (BCEMS) (2016)

The BCEMS provides a framework for coordinating emergency management across the province, outlining principles and processes used in mitigation, preparedness, response and recovery phases of emergencies and disasters. It was developed by Emergency Management BC under the authority of the Emergency Program Act and Regulation.

It provides a broad overview of the four-phase approach to emergency management: mitigation, preparedness, response, and recovery. It uses flood risk as an example of a hazard that can be mitigated through projects such as the construction of dikes. The guide emphasizes the importance of conducting a hazard, risk, and vulnerability analysis (HRVA) to identify hazards that may impact a community. It also highlights that mitigation measures can have unintended consequences.For example, a dike may reduce flood risk in one area while increasing it elsewhere, therefore such structural mitigation options should be carefully considered and often used as a last resort. The document also identifies tools such as hazard mapping for floodplains and directs readers to additional resources that provide more flood-specific guidance.

The document notes that the Provincial Regional Emergency Operations Centre (PREOC) is responsible for providing support to First Nations communities and recognizes First Nations as important stakeholders in emergency management. However, it provides limited detail on the specific roles, responsibilities, or coordination mechanisms involving First Nations. Overall, the document offers detailed guidance for each of the four phases, including goals, recommended activities, and resources but provides minimal discussion of Indigenous coordination or governance in emergency management.

Overall, provincial emergency response documents operate based on these four pillars: mitigation, preparedness, response and recovery and are supported by legal frameworks such as the EDMA. There is increasing acknowledgement of the need of Indigenous collaboration in flood risk management, although implementation remains fragmented across policies and documents.



Key Takeaways

BC's provincial adaptation policies are primarily contained within ClimateReadyBC and the BC Climate Preparedness and Resilience Strategy, which each contain a multitude of reports, strategies, programs, data, resources, funding opportunities, etc., that support local flood risk management. There is high-level support for NbS to mitigate climate risks (although no direct link between NbS and flood risk management is made), and there is emphasis on collaboration and support with First Nations. The BC First Nations Climate Strategy and Plan highlights collaboration with the provincial and federal governments for flood preparedness (emergency management). By identifying off-reserve upstream and downstream hazards that are beyond Squamish Nation's direct jurisdiction, it can press municipalities, the province, or industries to act.

To address general flood strategies, the B.C. Flood Strategy to 2035 was designed to work parallel to other flood-related strategies to comprehensively address mitigation, adaptation, and preparedness. Despite recommendations from First Nations and local governments, the plan does not include risk transfer. The Strategy identifies updating provincial regulations and policies, presumably including outdated policies that are unapt for dealing with long-term climate hazards, such as flood risk and drought. This includes: the Water Sustainability Act, Flood Relief Act, and Dike Maintenance Act. Climate Resources for Indigenous Communities is a database for mitigation and adaptation learning tools, funding opportunities, and general climate action funding.

Coastal and riparian flooding in BC are primarily addressed through long-term planning and mitigation. Policies focus on land-use planning, technical tools, and regulatory controls to reduce exposure. Coastal flooding is managed through sea level rise planning and shoreline strategies, while riparian flooding is addressed through watershed management and stream protection. Tools such as floodplain mapping, setbacks, and SPEAs are used to limit risk and guide development. There is also growing emphasis on NbS, including riparian restoration and shoreline enhancement.

Flood management in regional areas plans in the Sea to Sky and surrounding regions operates through land-use directions that restrict industrial activities, primarily forestry, in floodplain areas, rather than direct flood mitigation strategies. They interact with Squamish Nation by prohibiting or restricting extraction in Cultural and other areas through government to government agreements. Certain Squamish Nation interests from the 2007 agreement remained unresolved after its establishment, including Cultural Training Areas, Wild Spirit Places, and Wildlife Focus Areas, but these do seem to be addressed in phase 2 of the agreement. Landscape Unit Plans in the Chilliwack, Sea to Sky, and Sunshine Coast regions also do not directly address flood mitigation. Instead, they interact with flooding and slide risk by limiting forestry and other industrial activities, and aligning conservation efforts in floodplains and steep slopes.

The EDMA provides a central framework from which many other regulations, plans and guidance documents flow. It represents an important shift by recognizing Indigenous governing bodies as legitimate decision makers in emergency management, an area that has been historically managed federally. Alignment with DRIPA and requirements for consultation and inclusion of Indigenous knowledge are positive steps towards culturally informed planning. However, several provincial documents contain limited explicit direction on how Indigenous jurisdiction is operationalized in practice. While there is increasing recognition that First Nations communities are disproportionately affected by flooding, gaps remain in areas such as flood hazard mapping, consistent engagement and translation of legislative commitments into concrete planning and response.

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