# Building Climate-Informed Land Use Policy in British Columbia: A jurisdictional analysis

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# 1. Introduction

Land use policy in British Columbia is an essential facet of provincial climate action and emergency management. The ways in which municipalities and the province regulate land development, standards for new housing construction, and the long-term management of their relationship with Indigenous territories is intrinsically linked with the ways in which they manage, and potentially avoid, climate disaster[1].

Yet in British Columbia, land use policy governance is fragmented and confusing, and remains largely absent from the climate adaptation and disaster risk reduction conversations. Aspects of land management are alternately the responsibility of the province or of regional districts and municipalities[2], leading to inefficiencies and lost opportunities. Data on climate risks and their effects on development can be difficult to obtain, preventing legislators and managers from making informed decisions about land use policy[1]. And any decision on land use policy requires juggling the priorities of multiple constituencies and rightsholders—governments, developers, Indigenous nations, and the general population, increasing decision-making complexity tenfold.

How can land use policy in British Columbia surmount these challenges to face incoming climate impacts? How can governance be structurally clear, data-informed, and enabling for municipalities and communities who need to move quickly under adverse conditions? And how can Indigenous partners remain at the core of decision-making and discussions? To inform provincial policy according to global best practices, we suggest looking outward.

This paper presents a jurisdictional analysis of climate risk-informed land use policy frameworks both in Canada and internationally, focusing on constituencies that bear resemblances to British Columbia, to understand best practices in building and implementing such policy. By presenting case studies of successful policy structures, it examines how each government uses their authority to direct risk-informed land use policy and identifies best practices applicable to British Columbia's governance model. Finally, it presents core principles and concrete recommendations that the government of British Columbia can adopt to overcome some current challenges and build effective climate-informed land use policy.

We consider international frameworks for best practices in climate-informed land use policy, both in terms of multilateral agreements and land use management practitioners. Then, we examine the current state of British Columbia land use policy, including its current challenges in implementing climate- and risk-informed land use policy. We

present case studies from Quebec; Ontario; New Zealand; and Oregon and California in the United States, all of which are national or subnational governments of a similar size to British Columbia. Based on a scan of these jurisdictions and policy analysis, we present key recommendations for British Columbia's government to implement principles and policy tools into its land use planning.

British Columbia has an opportunity to lead in climate-informed land use policy, enabling its municipalities to make informed decisions and prevent potential disasters in a changing climate. To do so, it must learn from its peers and synthesise best practices into province-wide implementation.

# 2. Best practices in climate-informed land use policy

Though land use policy in British Columbia is fragmentary, international institutions—whether concerned in disaster risk reduction or in land use planning—have already produced guidance and principles that can be useful to understand how policy can be restructured to account for climate change. This section lays out a sample of best practices and principles from planning institutions, disaster risk reduction frameworks, and climate adaptation frameworks both internationally and within Canada which inform our recommendations.

## 2.1. International frameworks

### 2.1.1 Sendai Framework for Disaster Risk Reduction

Both Canada and British Columbia are signatories to the Sendai Framework, which outlines the responsibilities of governments in developing disaster risk reduction policies, of which land use policy is a key component.[3] It sets the tone for risk- and climate-informed policy that responds to the economic, environmental, and social pressures at play in any given time.

The Framework sets out principles by which governments can build capacity to avoid, manage, and recover from disasters, following four priorities: 1) understanding disaster risk; 2) strengthening disaster risk governance; 3) investing in disaster risk reduction for resilience; and 4) enhancing disaster preparedness for effective responses in recover, rehabilitation, and reconstruction.[3] . It also specifically discusses the need to integrate mechanisms within land use and urban planning to ensure an adequate focus on disaster risk management. Such mechanisms include the following principles relevant to

the British Columbian context:

- *Building a robust data framework:* Successful DRR policy frames propose the collection, analysis, management, and use of data to strengthen baseline capacity to address risk, vulnerability, and exposure across regions. The framework emphasises the need to develop location-based disaster risk information across multiple levels (decision-makers, local governments, and the public) to strengthen "all-of-society engagement and partnership"[3].
- *Building capacity across governance levels:* The framework urges the need to "build the knowledge of government officials at all levels, civil society, communities, and volunteers"[3] to share practices, training, and lessons learned. It also argues for the systematic evaluation and public accounting for disaster losses in order to understand the social, economic, environmental, and cultural repercussions of disaster risk[3].
- *Integrating Indigenous Knowledge:* Finally, the Sendai framework urges its signatories to "integrate traditional, Indigenous, and local knowledge and practices [...] to complement scientific knowledge in disaster risk assessment." [3] It recommends tailoring the implementation of policies and programmes to localities and specific contexts.

### 2.1.2. UN Habitat

UN Habitat's **New Urban Agenda,** which aims to increase the resilience of cities and human settlements, stresses that land use plans need to "[understand] disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment."[4] It advocates for five key aspects of disaster-informed land-use planning:

- practitioner and policymaker access to relevant land use planning data and information;
- disseminating location-based disaster risk information to policymakers, communities at risk, and the public;
- real-time access to land use information by using aerial and space-based information, and leveraging any relevant communications technology to enhance dissemination;
- building government officials, civil society, communities, and volunteers' knowledge and understanding of the importance of land use policy that supports disaster risk reduction; and
- strengthened technical and scientific capacity that consolidates existing knowledge to develop national and local land use plans.[4,5]

### 2.1.3. US Climate Alliance land use planning guide

The US Climate Alliance is a bipartisan coalition of state governors committed to advancing climate action, providing data-driven resources to its members to cover areas that may no longer be supported by the US federal government.[6] In its *Policy Guide for US States and Territories*, the Alliance lays out a number of climate-informed land use policy principles and strategies specifically targeted at subnational governments.[7] These are organised under three areas:

*Cross-Sectoral and intergovernmental planning**:*** strategies include:

- developing a climate and land use framework at the state level;
- supporting local and regional climate action;
- building in flexibilities and opportunities for customizable local and regional government programs and requirements;
- providing technical support to local and regional planning organizations; and
- integrating climate and land use with housing policies.

*Data-driven planning and decision-making**:*** strategies include:

- fostering data-driven policy development and decision-making;
- incentivizing or requiring data-drive land use decision-making at the local level;
- establishing centralized, public, open-source data platforms to inform transparent, accessible decision-making; and
- identifying metrics and performance targets around climate and land use.

*Stakeholder engagement and partnership**:*** strategies include:

- partnering with Indigenous people and their governments;
- empowering communities and building capacity;
- supporting models of equitable local engagement; and
- communicating the benefits of climate-informed land use planning to broad audiences.

## 2.2 Canadian frameworks

A scan of land use best practice literature reveals that provinces and planning associations do not have a unified set of best practices for climate-informed land use policy; rather, the guidance available is fragmented and largely related to emergency management rather than risk management. Nevertheless, we provide a high-level snapshot of guidance available in Canada, reserving provincial adaptations and cases for the following section:

### 2.2.1. National adaptation strategy

Canada's National Adaptation Strategy, released in 2023, considers disaster risk reduction and some of its interties with land use policy. It lays out the overall goal that "communities and all people living in Canada are better prepared to prevent, mitigate, respond to, and recover from the hazards, risks and consequences of disasters linked to the changing climate; the well-being and livelihoods of people living in Canada are better protected; and overall disaster risks have been reduced, particularly for vulnerable sectors, regions, and populations at greater risk."[8] One of its specific objectives is that "national, provincial, territorial, and regional readiness, mitigation, and recovery plans and policies integrate the latest evidence informed by risk and resilience assessments as well as local and Indigenous knowledge and are inclusive of the whole of society."[8] It also sets specific targets for high-risk communities to develop wildfire community prevention and mitigation plans, as well as for governments to work collaboratively to prioritise flood modelling for high-risk areas.

Though the strategy does not specifically consider land use policy, it notes several best practices and principles for increasing community resilience that are applicable to regional and municipal policy, notably:

- **Indigenous involvement in policy development:** the Strategy highlights the development of climate risk assessment and adaptation plans for and by Indigenous communities. It also notes that Indigenous knowledge and information about the environment and climate change can be applied to "environmental stewardship, disaster risk reduction, land use plans, resource management and emergency management."[8]
- **The need for proactive emergency management:** the Strategy recognizes Canada's fragmented approach to disaster management and highlights the need for "effective governance, whole-of-society collaboration and expertise, [and] strong communication on disaster risk." To build this, it advocates for "improved emergency preparedness, data generation and communication, as well as capabilities that are meant to support climate resilience and adaptation in the long term" through climate-informed emergency management mechanisms.[8]

### 2.2.2. Emergency risk management strategy

The 2019 *Emergency Management Strategy for Canada* lays out federal, provincial, and territorial priorities to shore up Canadian resilience.[9] Priorities germane to land use policy include, among others:

- **Enhancing whole-of-society collaboration:** the strategy encourages federal and provincial governments alike to empower community partners and governments to develop and promote disaster risk reduction approaches, including by integrating climate adaptation considerations in policy development.
- **Increasing whole-of-society disaster prevention:** the strategy underlines that the best emergency management is mitigation-based, and includes both structural (ie. infrastructure) and non-structural (ie. land use planning) mitigation measures.
- **Strengthening recovery by "building back better":** when disasters do occur, the strategy stresses that building back better can be integrated into policy and planning innovations regarding disaster risk reduction.

### 2.2.3. Planning associations and other guidance

The Canadian Institute of Planners' *Policy on Climate Change Planning* "envisions a future in which Canadian communities are planned, designed, developed, and managed to contribute to climate stability and to be more resilient in the face of unavoidable changes in the climate, and in the process, to become more liveable, prosperous, and equitable."[10] It recognizes planners' ethical obligation to consider climate risk in making planning decisions, and lays out a number of climate-informed planning strategies, including:

- Collaborating across sectors and jurisdictions to ensure an integrated, comprehensive approach to climate-informed planning;
- Incorporating risk-reduction methods into all plans, in line with the precautionary principle;
- Using established data collection methods to facilitate communicating between municipalities; and
- Inclusion and respect of Indigenous peoples in land use decisions.

Though not specifically concerned with provincial interventions, the Federation of Canadian Municipalities lays out 27 best practices for "sustainable land use" for municipalities alongside nine broad strategic directions, including enhancing green infrastructure, adapting communities to climate change, and leveraging data to improve land use decisions[11]. Their analysis shows that these practices 1) have significant triple bottom line benefits (social/economic/environmental); 2) have known impacts and have

been implemented in other municipalities; and 3) are easily replicated in other municipalities.

# 3. British Columbia and climate-informed land use policy: an overview

Land use policy in British Columbia, though perpetually evolving, is fragmented in its approach to an increasing level of climate risk. The province faces increased risk of extreme weather events such as floods and wildfires, all the while facing a housing crisis which has put significant economic pressure to develop in at-risk zones.[12] The Canadian Climate Institute has calculated that "the financial risk from new housing in flood and wildfire hazard zones could surpass $2 billion per year, with several municipalities facing losses in the hundreds of millions annually."[1] Developing and updating climate-informed land use policy is essential to avoiding catastrophic damage. This section provides a brief overview of how land use policy is managed in the province, how climate change informs such policy, and ongoing challenges and gaps in effective policy implementation.

## 3.1. Current state of land use policy governance

British Columbia comprises 161 local municipalities, 27 regional districts, and 9 watershed basins. Per the Canadian constitution, the provincial government is responsible for land use policy in British Columbia. However, though a series of laws, including the *Community Charter, Vancouver Charter, and Local Government Act*, the government has devolved legislative authority to municipalities and regional districts to govern land use planning.[13]

Municipalities are responsible for, *inter alia,* dividing and regulating land; creating zoning bylaws to designate floodplains; and develop official community plans with restrictions on the use of land.[13] This allows them to designate, regulate, and protect development from hazardous conditions, allowing them to potentially mitigate climate risk. Regional districts regulate land-use planning in electoral areas and can coordinate and support regional growth and development.

The specific roles of municipalities in risk management for events such as floods, wildfires, and extreme heat is set out in the *Emergency and Disaster Management Act and*

*Environmental Management Act,* but the legislative framework to enable municipalities to make effective decisions regarding climate risk remains fragmented.[14] Following the 2021 floods, the provincial government acknowledged its failure to protect communities from floods, and undertook a revision of the delegation of flood-risk management to municipalities, acknowledging municipalities' lack of capacity.[2]

Part of municipalities' lack of capacity to prevent or respond to extreme weather events is tied to the financial structure of disaster reduction and recovery in British Columbia. Municipalities have access to the province's Disaster Assistance Program, Community Emergency Preparedness Fund, and the Disaster Resilience and Innovation Funding Program as well as nationally available programmes like the Disaster Mitigation and Adaptation Fund, Green Municipal Fund, and the Canada Community-Building fund—yet municipal leaders have characterised the grant system as patchwork and unpredictable.[2]

## 3.2. Integrating climate risk into land use policy

The provincial government provides funding, planning guidance, and strategic plans to inform responses to climate change within land use policy. Though the province does not require or incentivize municipal hazard mitigation planning, it does shape planning through the *Local Government Act*, which suggests official community plans respect restrictions on the use of land subject in hazardous conditions.[13]

The province's planning principles outline that "consideration of the effects of climate change should be integrated into all planning processes to address and mitigate its impacts, reduce greenhouse gas emissions, and assist ecosystems and communities in adapting to future climate conditions."[15] Its *Socio-economic and Environmental Assessment Guidance for Modernized Land Use Plans* recommends that any environmental assessment include a future path that incorporates climate considerations in its best case scenarios, and recommends designing alternative planning scenarios that reduce exposure to climate risk and strengthen biophysical and human resilience. Such scenarios and analyses must be determined based on the available regional and provincial climate data. However, this guidance largely applies to Crown land and is less relevant to local government development contexts.

Guidance and guidelines for climate-informed land use planning by local governments are available through a mosaic of documents developed by both the province and

environmental NGOs, including:

- *Preparing for climate change: An implementation guide for local governments in British Columbia,* which identifies relevant tools for local governments to implement climate adaptation strategies and assess their benefits, allowing local governments to make an economic argument for climate adaptation in land use policy;[16]
- The *Risk-based land use guide* developed by the Geological Survey of Canada, which assists municipal staff in determining whether land use proposals are safe while taking into account the impacts of climate change on hazards;[17] and
- The province's *Development Permit Areas for Climate Action* guide, which is intended to assist local governments in determining how to use Development Permit Areas (DPAs) to conserve water and energy, reduce greenhouse gases, and consider climate adaptation lens in developing DPA guidelines.[18]

The provincial government is currently revising its land use planning model to become more centralized and streamlined, having admitted that it "can be confusing to understand, and difficult to identify which planning approach is needed for values of concern."[19]

## 3.3. Indigenous land management and governance

Much of British Columbia's land is unceded, and the over 200 First Nations have inherent and constitutionally affirmed rights and title. In 2019, the provincial government adopted the *Declaration on the Rights of Indigenous Peoples Act*, which aims to support the affirmation of and develop relationships with Indigenous governing bodies. Section 3 provides that all laws in British Columbia be consistent with the UN *Declaration on the Rights of Indigenous Peoples*, in consultation and cooperation with First Nations.[20]

In that spirit, British Columbia's *Preparedness and Adaptation Strategy* commits to integrating Indigenous knowledge and perspectives on climate change into its work, including land use planning. It also notes that "the approach taken in future assessments of climate risk will align with commitments made through the Declaration on the Rights of Indigenous Peoples Act, integrating Indigenous knowledge into the assessment process, and recognizing the unique impacts to Indigenous territories, values and ways of life."[21] The province also provides funding to First Nations for climate and emergency management work through, for example, the Disaster Resilience & Innovation Funding

Program.[22]

The Strategy commits to partnering with Indigenous nations to create a guide on integrating climate considerations into land use processes, in order to "provide recommended approaches for developing, implementing and monitoring adaptation and greenhouse gas mitigation actions for modernized land use planning projects [...] [for] provincial and Indigenous planners undertaking land use planning in a partnership-based approach."[21]

British Columbia's updated *Flood Strategy* (2024) emphasises the need for Free, Prior, and Informed Consent; fair and transparent process; and reconciliation as a way of addressing the needs and worldviews of Indigenous communities.[23]

Though British Columbia lacks a provincial wildfire strategy, First Nations have led risk reduction efforts by reviving cultural burning to achieve both risk reduction and cultural burning, though several barriers and misunderstandings exist at the national and provincial governance levels on the topic.[24]

## 3.4. Limits and challenges

While instruments such as land use planning policy, flood-risk mapping, and wildfire prevention exist and are available to municipalities, the choice and implementation of these tools remains a challenge to this day. Consequently, risk scholars have noted that there has been little material improvement in risk management, for example, flood preparedness, in British Columbia.[2] The literature highlights several ongoing challenges:

*Unclear jurisdictions and fragmented governance*. A lack of centralized authority to manage and prevent climate-related impacts in British Columbia around flooding, wildfire, or heat is hampering an optimal response.[1,2] For example, flood risk management is the responsibility of local governments, but disaster mitigation—which partly concerns flooding—is the responsibility of the Ministry of Emergency Management and Climate Resilience.[25] Climate change generally is a "shared responsibility" across levels of government, which creates the risk of both potential duplication of work and potential blind spots.[2,18] Moreover, from a funding standpoint, the fact that federal and provincial governments can provide payments for uninsured damages creates a "false sense of security"[2] that hampers municipalities' motivation to prioritize land use policies that

reduce risk.

*Lack of adequate data to inform local policies.* Where municipalities in the province have a responsibility to plan, they often lack the necessary data to make informed decisions. For example: British Columbia provided flood mapping from 1974, but passed the responsibility to municipalities in 2004.[2] Due to a lack of funding and centralized direction, local efforts to map flood risk have dampened throughout the province, and most communities have not completed, updated flood maps; many of those used today date back to the 1990s, and were not developed with up-to-date climate modelling.[26]

Where funding does exist to generate datasets for climate risk prevention, there are rarely standardized processes, which creates a patchwork approach to environmental risk data. Some municipalities in British Columbia, like the District of North Vancouver, have developed their own wildfire hazard maps to guide land use planning, but the creation of such maps is subject to resources that not all municipalities have.[1]

*Risk of conflicting priorities.* Municipalities in British Columbia are faced with divergent and competing priorities in terms of land-use planning. Analysis estimates that flood protection infrastructure currently shields British Columbia homes from $2 billion in annual flood losses, with an additional $960 million soon to be added due to new housing developments[1]. Yet as the intense need for housing leads to pressure from developers, short-term budgetary constraints and ideological imperatives can take precedence over complex, long-lasting, and seemingly unnecessary investments and policy frameworks.[2,27] Combined with existing post-disaster assistance, which discourages municipalities from investing in flood-risk management, municipal and regional governments can be faced with moral hazard, and may not move swiftly enough to prevent climate-related damages.

# 4. Case studies: climate-informed land use policy in British Columbia-adjacent jurisdictions

To understand how land use policy integrates climate risk in other jurisdictions, and how best practices are implemented on the ground, we performed a jurisdictional scan of five regional or national governments: Quebec and Ontario (in Canada); Oregon and

California (in the United States); and New Zealand.

Each of these jurisdictions was chosen due to its relatively similar geographical scope, governance structures, and potential climate risks, which make them comparable enough to British Columbia to draw lessons from their land use policy. Our analysis considers:

- The roles and responsibilities of regional and local and government planning in land use planning;
- How climate risks are integrated into land use policy, if applicable;
- Specific examples of land use policy tools that can be used to address climate risk;
- How Indigenous peoples and governance systems interface with regional government and land use policy; and
- Overall differences and similarities to British Columbia that can inform analysis.

The case studies we present are not exhaustive, nor do they consider every potential aspect of climate-informed land use policy. Our goal was to identify high-level policies and practices that could be applied to a British Columbian context to address the gaps we identified previously.

## 4.1. Case study: Quebec

Overall, Quebec has strict oversight and regulations related to climate-informed land use policy. It balances a provincial adaptation plan with guiding frameworks that include hazard maps and specific requirements for regional and municipal governments on land development.

**Climate risks of concern:**

Extreme precipitations, flooding, landslides, wildfires, extreme heat, and extreme wind events.[12]

**Roles and responsibilities for land use planning:**

Through the *Municipal Powers Act,* the province delegates land use planning implementation to regional county municipalities (RCMs) and municipalities but maintains strict oversight and regulations through legal means (e.g. the *Environment*

*Quality Act*) and regulations (e.g. landslide and coastal erosion regulations). The Province is not legally required to consult with municipalities before enacting changes to land use legislation or policy.[2]

RCMs have a planning and supervisory role in land-use planning by their local municipalities, and are responsible for identifying areas of potential natural hazards that municipalities must integrate into land use planning.[2] They also play an advisory and supervisory role for municipalities in relation to land use policy.

**Integration of climate risk in land use policy:**

Quebec's climate plan, the *Plan pour une économie verte*, highlights land use policy as a key tool in climate adaptation and commits to reviewing laws, regulations, and guidelines to synchronise climate adaptation and land use in the region.[28] The Province has also elaborated a *Plan de mise en oeuvre 2023-27 de la politique nationale de l'architecture et de l'aménagement du territoire* which includes in its objectives "enhancing the adaptive capacity of communities to climate change and the conservation of natural areas and biodiversity", and lays out actions that include supporting local municipalities through capacity-building and additional funds to create and implement climate adaptation plans.[29]

Municipalities have access to a variety of funding sources for both adaptation and recovery. In the event of a disaster, municipalities can apply for financial assistance through the *General Indemnity and Financial Assistance Program Regarding Actual or Imminent Disasters*, but eligibility is contingent on having adopted a civil disaster protection plan as laid out under the *Civil Protection Act.*[2] However, residents are not disqualified regardless of whether municipalities have a plan, which critics have qualified a lack of incentive to reduce flood risk.[2,27] Quebec does limit financial assistance for homes built in floodplains after regulations are enacted, including by excluding homes built in 1:20 flood zones and capping total assistance[30].

Quebec's flood risk regulation infrastructure is detailed and multi-layered. The province has flood regulations that limit development in riverine and coastal flood areas. Historically, restrictions were limited to 1-in-20yr and allowed 1-in-100yr with floodproofing, but are modernizing a new generation of flood zones and regulations to be risk-based.[31]

**Examples of land use policy tools for climate risk:**

- *Regional land use plans:* RCMs use land use and development plans (SADs) and can develop flood risk management plans. Municipalities then adopt urban plans aligned with SADs, issue permits, and use by-laws including zoning.[32]
- *Access to climate information and best practices:* Municipalities have access to several climate-informed tools for planning, including but not limited to summaries of climate risks per region[33] and best practices in climate-informed land use policy.[34] Quebec publishes landslide and coastal erosion maps, and is updating its flood mapping programme beginning in spring 2026.[35]
- *Disclosure requirements:* Although most Canadian provinces do not require developers or sellers to disclose flood or wildfire risk, Quebec is a notable exception, legally mandating sellers to disclose flood risk by indicating whether a property is in a flood zone and if it has previously sustained water damage.[36] The province also requires a location certificate provided by a surveyor indicating whether a property is in a flood zone, and details of any applicable municipal restrictions.[37]

**Indigenous land management/governance:**

The Government of Quebec's *Plan d'action d'aménagement du territoire* has as a specific objective to "develop a sustainable and integrated approach in land use policy while taking into account Indigenous nations."[29] Within this objective, it aims to consult with First Nations and Inuit by creating working groups on land use policy.

The OASIS programme on preventing and reducing climate risk provides financial support for Indigenous communities in planning, establishing, and sustaining greening projects.[38]

The Quebec Order of Urbanists has established a policy document on its relationship with Indigenous nations, noting the need to, *inter alia*, work to integrate Indigenous perspectives in Quebec's land use policy framework; consider Indigenous peoples under the concept of protection of the public; and explicitly valorize and put forward Indigenous knowledge and expertise.[39]

**Comparison to British Columbia:**

Similar to British Columbia, land use in Quebec is primarily governed through local government land use plans and applicable bylaws. Local governments are responsible for identifying local hazards, though formal climate adaptation plans are not required by municipalities.

However, Quebec has stricter oversight, regulations, and guiding frameworks for climate-informed land-use policy. This includes hazard maps and specific development regulations for RCMs and municipalities. The province lays out a provincial climate adaptation strategy and climate-specific funds that relate directly to land use policy, allowing for some cross-departmental oversight of climate-informed land use policy. Moreover, land use decisions directly impact access to funding for disaster recovery, which incentivizes climate-aware land use planning decisions.

## 4.2. Case study: Ontario

While in theory, Ontario has stricter oversight, guidance, and legislation than British Columbia to help local governments restrict development in hazardous areas, recent deregulation efforts may put some of this advantage into question. From a strategic climate adaptation standpoint, Ontario is likely behind British Columbia in terms of its provincial adaptation plan and provincial fund for adaptation work.

**Climate risks of concern:**

Extreme precipitation, flood, extreme heat, wildfire and wildfire smoke, ice and windstorms, drought.[12]

**Roles and responsibilities for land use planning:**

In Ontario, land use planning responsibilities are led by the province but implemented by municipalities.[40] Through a series of acts, including but not limited to the *Municipal Act, 2001; City of Toronto Act, 2006;* and *Environmental Protection Act,* municipalities have the authority to control land use through official planning documents and zoning bylaws. Under the *Planning Act,* the province provides a *Provincial planning statement* that outlines province-wide policy directions on land use for municipalities to consider and comply with.[40]

Ontario's 36 Conservation Authorities have a specific authority to understand and manage natural hazards and support municipalities as technical advisors. They can become involved in the planning and development processes as adjacent landowners or proponents, and can represent provincial interests regarding natural hazards. They also act as watershed-based resource management agencies.[41]

In the 2024 revision of the *Conservation Act*, municipalities inherited several responsibilities previously held by Conservation Authorities, notably commenting on development applications for compliance with natural heritage, or ensuring appropriate erosion controls for new developments.[42]

**Integration of climate risk in land use policy:**

The 2024 *Provincial Planning Statement* specifically directs planning authorities to incorporate climate change considerations in planning infrastructure development, low-impact development, and additional risk mitigation for hazardous areas.[43]

Ontario's current integration of climate risk in land use policy is shifting rapidly. Though municipalities regulate development, provincial cabinet ministers can override regulations for development in hazard zones if the intervention is deemed provincially relevant.[43] Per new 2025 legislation, ministers can also create Special Economic Zones in which regulations may be ignored if considered in the economic interest.[44]

Under Ontario's Flood Strategy, the province commits to identifying potential climate impacts on infrastructure assets and development zones, including considering altering building zones.[45] Ontario maintains binding regulations that limit development in high-risk areas, enabled by conservation authorities' flood plain mapping.[46] Beyond flooding prevention, the province also provides technical guidance for wildfire risk assessment for municipalities.[47]

**Examples of land use policy tools for climate risk:**

- Local governments have access to **restrictive covenants**, a type of property control that operate independently of zoning bylaws and can prevent land banking or inappropriate development. For example, in 2019, Prince Edward County used a

restrictive covenant when selling industrial land to ensure that development would be completed in alignment with the County's planning principles.[48]

- **Green development standards** can be developed by municipalities to specify certain climate resilience requirements for development. Several Ontario municipalities, in collaboration with the Clean Air Partnership, created a toolkit to help communities develop and implement such standards, which can be integrated into Official Plans, performance checklists, and urban design guidelines.[49]

**Indigenous land management/governance:**

Per the *Provincial Planning Statement*, planning authorities are required to engage with Indigenous communities "and coordinate on land use planning matters to facilitate knowledge-sharing", as well as support consideration of Indigenous interests in land-use decision-making.[43] Under the Community Environment Fund, Indigenous communities can request funding for environmental restoration projects.[50]

**Comparison to British Columbia:**

Similarly to British Columbia, local governments in Ontario are responsible for implementing land use policy through official plans and zoning. Though local governments are not required to create climate adaptation plans that address land use, many have them.[51]

Ontario's Conservation Authorities have specific objectives for conservation that are based on watersheds rather than economic or demographic zones, marking a stark difference with British Columbia. Their oversight in flood and hazard management and development, as well as technical advisory to municipalities, allows them a more integrated insight into adaptation.[46]

While Ontario ostensibly has stronger provincial oversight than British Columbia through specific guidelines outlined in the *Provincial Planning Statement,* recent legislative changes suggest that the province is de-prioritizing climate-informed land use in favour of rapid economic development, which may affect the integrity of its land conservation legal framework.[44] Furthermore, Ontario does not have a provincial adaptation plan, though a bill has been tabled to create one.[52] Finally, Ontario's work on Indigenous land use

partnerships, as well as incorporation of Indigenous knowledge in land use policy, are less developed than British Columbia or several other jurisdictions.

## 4.3. Case Study: Oregon

Oregon's land use policy is tightly integrated, with the state providing an overarching climate-informed land use framework and local governments preserving discretion in the framework's implementation. The state has also significantly invested in capacity-building for planners and municipal officials, allowing for highly informed decision-making.

**Climate risks of concern:**

Floods, wildfires, extreme heat, drought and water scarcity, sea level rise, earthquakes.[53]

**Roles and responsibilities for land use planning:**

Land use planning in Oregon is a state responsibility, the particularities of which are delegated to local governments.[54] The state has a Statewide Land Use Planning Program that local authorities must conform to, while the Department of Land Conservation and Development (DLCD) oversees a coordinated land use program and a mandate of supporting comprehensive planning in partnership with cities, counties, and regional entities in the state. Both mechanisms are meant to ensure local governments are executing the overall vision from the DLCD.[55]

Despite state oversight of guidelines, land use in Oregon preserves the principle of local responsibility and control of land-use decisions, and local governments "retain significant discretion as to how they implement the program through local comprehensive plans and implementation of land use ordinances."[56]

**Integration of climate risk in land use policy:**

Climate risk is integrated into land use planning at multiple levels across the state. Oregon's 2023-2031 DLCD Strategic Plan includes a focus on improving natural resource protection and climate resilience[57]. The Oregon Climate Adaptation Framework identifies the need to encourage land use planners to integrate opportunities to address climate change.[58]

Oregon's State Agency Climate Adaptation Framework includes sponsoring conferences aimed at state employees, land use planners, NGOs, and others to provide information on the state of the climate, resources for mitigation and adaptation, land use planning tools, and technology transfer. It also stresses the need to standardise, integrate, and share data transparently, and train staff on how to use and integrate climate and equity data into community planning.[57–59]

**Examples of land use policy tools for climate risk:**

*Natural hazard mitigation plans:* These tools use data gathered by the municipal government as well as state data, expertise from a local NHMP steering committee, and input from subject matter experts to identify and prioritize hazards and vulnerabilities facing a local, state, or tribal government.[60] DLCD works with local planners to identify potential hazards, vulnerabilities, and risks that should be described in a local NHMP. Local NHMPs are reviewed and approved by the Oregon Office of Emergency Management (OEM) and then by the Federal Emergency Management Agency (FEMA).[61] Once approved, the municipality may receive federal funding for natural hazard mitigation planning and projects.

*The National Flood Insurance Program****:*** Local governments participate in this federal program in collaboration with DLCD, which coordinates its implementation. DLCD provides training for local floodplain managers, property owners, and others to ensure good standing. In exchange for participation, FEMA provides flood insurance to property owners and renters.[62]

**Indigenous land management/governance:**

Each of Oregon's nine Indigenous tribes has authority over planning on its own reservation lands, which includes similar climate goals to state-mandated goals, as well as unique and respective targets.[63] Climate risk is integrated into planning, and land use regulations aim to be risk-informed. For example, the Confederated Tribes of the Umatilla's 2015 *Climate Change Vulnerability Assessment* recommends land use regulations for flood-prone areas, as well as in agricultural lands.[64]

Oregon's state government recognises the state's tribes as sovereign nations in their own right, and is required to consult on any initiatives that would impact tribal rights and territories—such as natural resource management, land use planning, and historic

preservation.[63] The State Agency Climate Adaptation Framework contains a mandate to apply an equity lens to any climate-related initiatives, including impact on tribes.[58]

**Comparison to British Columbia:**

Compared to British Columbia's patchwork approach to governance, Oregon's climate-informed land use policy is clearly integrated between local, state, and federal governments. Local responsibilities are clear, and the provision of insurance is dependent on local development and enforcement of climate adaptation plan. The state sets targets and standards, but municipalities and local governments are given discretion in how they achieve those goals.

Oregon also sets requirements for climate-aware land use planning by making its disaster relief funding conditional on meeting state and federal standards for planning. This ensures compliance while providing individual communities the autonomy to implement standards in a locally relevant manner.

Compared to British Columbia's ongoing consultations with First Nations, Oregon's Indigenous tribes have full planning authority over their lands, and conduct their own vulnerability assessments to inform policy. Combined with the state's duty to consult and its equity mandate in climate adaptation planning, this enhanced independence provides for more of a nation-to-nation framework in negotiating climate-aware planning and policy.

## 4.4. Case Study: California

California stands out in climate-informed land use planning for its highly centralised approach to climate strategy, allowing local governments to interpret central guidelines in their local planning. The state is also one of the strongest providers of climate-related technical information, allowing municipalities to make informed planning decisions.

**Climate risks of concern:**

Floods, wildfires, extreme heat, drought and water scarcity, sea level rise, earthquakes.[65]

**Roles and responsibilities for land use planning:**

Land use planning in California is primarily a state responsibility, though the Governor's

Office of Land Use and Climate Innovation, but is largely implemented by local governments. The LCI works with relevant state agencies and departments, regional planning organisations, and local jurisdictions to, among others, formulate long-term land use policies and goals; assist in plan preparation and funding; and provide general planning assistance to municipal governments.[66]

The state delegates most local land use and development decisions to cities and counties, and planning decisions require municipal approval.[66] However, the state can set guidelines and larger policy targets to which local governments must conform; as a result, the LCI generally acts as a clearinghouse or liaison between state and local governments as well as state agencies, providing policy and technical assistance and ensuring cohesion between different programmes and directives.[67]

**Integration of climate risk in land use policy:**

California's State Adaptation Strategy integrates and connects sector-specific plans (extreme heat, water supply, climate-smart lands, wildfire and forest resilience and transportation, *inter alia*) and integrates the land use aspects of each of these plans.[68]

California's Office of Planning and Research hosts the Integrated Climate Adaptation and Resilience programme (ICARP), which aligns and coordinates adaptation at all levels of government. ICARP provides direct technical assistance for local and regional governance, coordinates state-funded climate science research, and manages and supports climate resilience grant programs as well as recovery funding in disasters.[67]

State law (SB 1035) requires local governments to incorporate climate adaptation into current planning processes. While municipalities have flexibility of which processes they use to meet these requirements, they must, at baselines, conduct a climate vulnerability assessment; develop adaptation goals, policy, and objectives; and institute reasonable implementation measures.[7] They are also required to maintain a Local Hazard Mitigation Plan which is aligned with minimum FEMA standards in order to be eligible for federal funding pre- and post-disasters.

General plans are required to consider known climate risks, such as flooding and wildfires. Plans must include flood hazard areas, and wildfire areas. Development in flood hazard zones is restricted unless appropriately mitigated to state or FEMA standards.[69]

California's Vulnerable Communities Platform provides information for planners in climate-vulnerable communities about potential hazards, projected impacts, and opportunities for climate-resilient planning.[70]

**Examples of land use policy tools for climate risk:**

*Centralised information and funding clearinghouse systems:* The Department of Water Resources hosts the Flood Emergency Response and Information Exchange, which allows local governments to access real-time data collection and exchange, decision support systems, and other flood-related documents.[71] California's Wildfire Mitigation Program provides financial assistance and information for homeowners for home hardening and mitigation strategies by rating applicants' present and likely future wildfire risk.[7,72] California also requires sellers to disclose whether properties are exposed to key climate hazards.[73]

*Land-efficient development approvals:* Whereas most development of housing projects requires discretionary review by municipalities, California's *Affordable Housing and High Road Jobs Act of 2022* allows a simplified ministerial review process if projects meet specific standards for climate-informed, land-efficient development.[7] This lowers development costs by streamlining permitting, which increases the pace of implementation for climate-informed housing developments.

**Indigenous land management/governance:**

The Californian government has a duty consult California's 126 Native American Tribes on projects that could affect cultural resources, ensuring their early involvement in the planning process; however, consultations have shown that meaningful discussions are limited by lack of staff resources, cultural differences, and time constraints.[74] The consultation guidelines are currently being revised, and are projected to be completed in 2027.[75]

In recent years, the state and its agencies have acknowledged tribes' key role in environmental shaping and management, with new policies allowing agencies to enter into memoranda of understanding to allow access or co-management of lands, as well as stewardship that integrates traditional ecological knowledge.[76] For example, the state

has begun working with tribes to implement wildfire management based on Indigenous knowledge and practices, approving the use of prescribed cultural burns.[77] California has also created the Tribal Capacity Building Pilot Program, which "provide[s] funding and technical assistance to California Native American Tribes, enhancing their staff capacity to advance Tribes' climate-related work."[78]

**Comparison to British Columbia:**

Compared to British Columbia, California provides strong hazard data and mapping to inform general planning and land use planning at the municipal level. High-level guidance is integrated and flows from a centralised adaptation strategy, which allows for consistent application of risk reduction principles. Moreover, its centralised clearinghouse mechanism for climate information allows both practitioners and policymakers to rapidly access data that can inform planning considerations. California also offers stronger incentives than British Columbia for climate-aware planning, given that its disaster relief funding is tied to FEMA- or state-set requirements.

California's integration of Indigenous knowledge and governance in its disaster risk planning and land use policy is less developed than British Columbia's, but shows signs of rapid development. Specifically, the potential for tribes to co-manage land which would allow an enhanced level of agency beyond consultation.

## 4.5. Case Study: New Zealand

New Zealand's climate-informed land use policy is characterized by high-level guidance that is independent of specific government ministry, as well as thoroughly supported by publicly available hazard data, making the country an example in setting up policy infrastructure that avoids siloing.

**Climate risks of concern:**

Floods, wildfires, extreme heat, drought and water scarcity, sea level rise, landslides, earthquakes, tsunamis.[79]

**Roles and responsibilities for land use planning:**

New Zealand is currently reforming its *Resource Management Act* to create planning

legislation more aligned with risk reduction. As it stands under the *Act*, local governments are tasked with land use planning; regional councils (the equivalent of regional districts) are responsible for natural hazard management. Territorial authorities are responsible for land use planning through District Plans, and share responsibilities for natural hazard management. [80]

The Ministry for the Environment provides mandatory guidance on sustainable land use planning, risk tolerance, and land use planning for natural hazards through National Policy Statements (NPS).[81] The Natural Hazards Commission, a Crown entity, is responsible for natural hazards insurance management, as well as providing publicly available data, facilitating research, and knowledge-sharing on natural hazards nationally.[82]

Regional councils and territorial authorities can control land use and development to avoid or mitigate natural hazards. They prepare regional policy statements and plans to assist councils in carrying out the *Resource Management Act*.[83] Territorial authorities can fall within more than one region.

Local governments enforce land use policy through bylaws, permitted activities, and by setting standards for development.

**Integration of climate risk in land use policy:**

New Zealand's national adaptation plan commits to accounting for flood, wildfire, and other climate risks in infrastructure planning and investment decisions. The NPS on Urban Development requires that planning decisions contribute to urban environments that are "resilient to the likely current and future effects of climate change"[84], while the NPS on Coastal Development requires hazard assessments, as well as avoiding development and increasing protections in coastal risk areas.[85] The new NPS for Natural Hazards provides specific guidance to manage risk to people and property during subdivision use and development. The National Adaptation Plan directs city councils to "stress test plans, policies and strategies using a range of scenarios as recommended in the interim guidance and the National Climate Change Risk Assessment Framework."[86]

The Urban Development Act 2020 sets up a framework for delivering comprehensive large-scale urban development. Under the Act, the government can collaborate with city

and regional councils to determine opportunities for climate-resilient development.[87] The government also publishes guidance and data on climate hazards and development, including the Coastal hazards and climate change guidance for practitioners in land-use planning.[88]

**Examples of land use policy tools for climate risk:**

*National policy statements* are topic-based and allow for national directives that span multiple ministries, coordinating action across government agencies. Particularly relevant to climate-informed land use policy are the NPS on Natural Hazards and on Urban Development.

*Centralised climate risk information:* The Natural Hazards Portal provides hazard maps for regional councils, as well as histories of past natural hazard events and information for citizens on natural hazard insurance.[89]

**Indigenous land management/governance:**

The governance of Māori land in New Zealand is extremely complex, informed by the country's colonial history and historical dispossession of land from its Indigenous peoples. At present, the Ministry of Māori Development works closely with the Māori Land Court to general policy on Māori land use and development.[90]

New Zealand's National Climate Change Risk Assessment incorporates risks and interdependencies that are particular to Māori perspectives, including the potential need for parallel risk assessments for Māori, by Māori.[79] It considers risks from climate change that affect Māori interests, protocols, and power; as well as disproportionate climate impacts due to socioeconomic inequalities.

The National Adaptation Plan commits to supporting Māori climate adaptation by establishing a platform for Māori climate action; recognising that Māori work through worldviews outside western interpretations; and adopting a climate change framework that guides future consultations with and adaptation plans coming from Māori communities.[91]

Environmental impact assessments in New Zealand must consider Māori perspectives, including cultural history and spiritual significance, as well as environmental issues of

concern to Māori, and requires direct consultation with *tangata whenua* (people of the land in the area).[92]

**Comparison to British Columbia:**

High-level structures of land use governance in New Zealand are similar to British Columbia, with top-down national guidance being implemented by local governments. Major differences do exist: the technical guidance that the government of New Zealand makes available to regions and practitioners of land use policy is significantly more detailed and comprehensive. Moreover, national policy statements on land use allow for guidance that transcends any one ministry, allowing for consistent application of guidelines regardless of legislative area. Finally, Māori-focused climate adaptation and land use policies emerge from a nation-to-nation relationship, which requires direct consultation. The government actively collaborates with Māori to ensure that developers follow through with the consultation process.

# 5. Analysis and recommendations: What practices can British Columbia adopt from its peers?

British Columbia's land use policy, while still evolving, remains hampered by multiple challenges. Climate-informed land use policy is governed by multiple departments and programmes, each with their own policy instruments, leading to a lack of unified guidance for developers or municipal planners. Hazard data and climate information are not consistently available, leading to a lack of informed decision-making for landowners, developers, and policymakers. And the intense pressure to develop further housing stock without climate risk guardrails leads to the potential for competing priorities and development in climate-vulnerable areas.

Revising British Columbia's land use policy to ensure it is climate informed requires looking outwards. The lessons provided by Quebec, Ontario, California, Oregon, and New Zealand, as well as the best practices discussed by international planning and disaster risk reduction institutions, provide a wide palette of possible policy tools that may be adaptable to British Columbia's context.

Based on the jurisdictional scan above, we first present three high-level principles for ensuring climate-informed land use policy in British Columbia. Then, in Table 1, we

present an overview of policy tools that can help put these principles into action. While this analysis is a relatively high-level scan, and cannot purport to provide a comprehensive overview of the policy tools at the government's disposal or the feasibility of their integration, it does provide a starting point for thinking outside the current model of land governance in British Columbia.

## 5.1 Principles for climate-informed land-use policy:

1. *Embed rigorous climate data into land-use policy.* Resolving contradictory priorities from land use policy means that decision-making needs to be based on accurate hazard data rather than exclusively on political or market considerations. To ensure this, governments need to 1) ensure that datasets are accurate, up-to-date, and provide adequate coverage and granularity for development decisions; 2) ensure that the data is accessible to land use policy practitioners, developers, and local governments; and 3) leverage the presence of accurate datasets to require high disclosure standards for developers and municipalities.

Examples from the above jurisdictional scan show the importance not only of having access to data, but of communicating it well across government. For example, Oregon's climate adaptation framework embeds a need to standardize, integrate, and share data transparently across departments. Quebec's modernized flood mapping has been twinned with a legal requirement for sellers to disclose potential flood risk on their land. Several jurisdictions have created a "climate data clearinghouse" of sorts that allows the public and land use policy practitioners to access up-to-data climate projections and data for their region, allowing for better-informed long-term land use policy.

2. *Build guidance and capacity across sectors and levels of government.* Those jurisdictions that have developed land use policy closest to best practice have done so by productively linking federal, regional/provincial, and municipal government institutions. Overall, best practice indicates that climate-informed land use governance needs a clear, high-level framework that provides overall guidance and support, while allowing local governments to customize local implementation of guidelines or legal requirements. High-level frameworks can stretch across government departments, ensuring a cohesive governance framework no matter the specific area of policy.

For example, New Zealand's National Policy Statements or Oregon's coordinated land use programme create mandates that span across government departments and set high-level policy goals but allow regional districts to interpret the best application of guidelines. Regional governments or federal agencies can set conditions on financial

assistance to ensure that local governments comply with guidelines, making disaster relief funding conditional on regionally supported climate hazard assessments.

3. *Build Indigenous engagement through every step of climate-informed land use planning.* Most of the jurisdictions we surveyed, including British Columbia, have made consultation with Indigenous peoples mandatory throughout planning and climate framework. Given the extreme relevance of Indigenous knowledges in preserving and protecting both natural environments and human livelihoods, some have even gone further, and integrated Indigenous sovereignty and independence in developing their own land management and climate adaptation frameworks. To meet best practice, land use planners and practitioners should consider both Indigenous and scientific knowledges in disaster risk assessments and adaptation planning, through collaborative and shared decision-making. Climate-informed land use policy should also support the material conditions required for Indigenous communities' own land use planning—such as, for example, Quebec's OASIS fund for greening projects in Indigenous communities.

**Policy tools for climate-informed land use policy**

Any policy tool will need to fit its context; it would be presumptuous to assume that any of those deployed in the case studies considered above would fit perfectly into British Columbia's policy infrastructure. Despite this, the jurisdictional analysis reveals five categories of policy tools that have shown to be effective in integrating a climate lens into land use and development, and which policymakers may wish to consider to either bolster land use policy or build new capacities.

*Legal standards for climate-resilient development* refers to tools that require developers to exert caution when it comes to potential climate risks, either by requiring climate vulnerability assessments; requiring disclosure of potential hazards prior to sales; or restricting development on land deemed too hazardous. Conversely, they can also include development standards which, if met, can expedite approvals for climate-resilient construction.

*Climate-informed planning tools* encompass summaries of climate hazards, best practice guidelines, knowledge transfer opportunities, and clearinghouse mechanisms for practitioners—all essential sources of knowledge that can help local governments meet regional standards for development. These tools have multiple benefits, allowing not only practitioners but also the general public to be better informed about potential hazards and opportunities for funding in the event of a disaster.

*Centralized or cross-departmental management structures* are coordinated land use policies or programmes that are applied across ministries, departments, or regions, and which help break through bureaucratic silos. Often emanating from a national or regional climate adaptation plan, they allow each department to take guidance from a central set of targets and principles and communicate with each other. These structures help avoid unnecessary overlap or contradictory policies.

*Conditional funding requirements for disaster relief* are dynamic instruments that allow local governments and landowners to be independent in their application of land use policy guidelines, but which eliminate the risk of moral hazard by ensuring that at least a minimum standard is met before insurance or relief funding can be provided in the event of a disaster. This ensures that public funds are not distributed to projects that may have been built in the knowledge that they would be vulnerable to climate risk.

*Enhanced cooperation with Indigenous peoples* encompasses policies and mandates that recognize and center the sovereignty and knowledge of Indigenous nations in land use planning and climate adaptation. These begin with, but often go beyond, a duty to consult relevant nations before making any policy or planning decision affecting Indigenous land. It can also include understanding that Western scientific data can be complemented with traditional ecological knowledge to create more robust, culturally appropriate, and acceptable land use plans.

Each of these policy tool categories can be implemented into current policy frameworks to ensure that land use planning recognizes the vulnerabilities and opportunities available within each region, and the capacity of a regional or provincial government to make significant change without impeding local governments' legislative authority. Table 1, below, summarizes the above analysis with case study examples.

**Table 1. Policy tools for climate-informed land use policy**

| Policy tool category | Policy tool example | Relevant jurisdiction |
|---|---|---|
| Legal standards for climate-resilient development | Legal requirement for climate vulnerability assessments in planning | California |
| | Green development standards | Ontario |
| | Expedited approvals for land-efficient development | California |
| | Restrictive covenants for at-risk land | Ontario |
| | Disclosure requirements for flooding risk | Quebec |
| Climate-informed planning tools / hazard resources | Summaries of climate hazards by region for public/practitioners | Quebec, New Zealand, Oregon, California |
| | Best practices guidelines for climate-informed planning | Quebec, Ontario |
| | Government-sponsored knowledge transfer and capacity-building opportunities for local governments and practitioners | Oregon |
| | Clearinghouse for specific hazard information and resources (e.g. flooding) | California |
| Centralized/cross-departmental management tools for land use policy | National policy statements on development and/or hazards | New Zealand |
| | Integrated adaptation and resilience programme (cross-departmental) | California |
| | Coordinated land use programme | Oregon |
| "Climate strings" for disaster relief/insurance | Civil disaster protection plan for flooding | Quebec |
| | Natural hazard mitigation plan requirement | Oregon |
| | National flood insurance program requirements | Oregon |
| Enhanced cooperation with Indigenous peoples | Funding for Indigenous climate resilience and risk reduction in land development | Quebec, Ontario |
| | Recognition of independent Indigenous climate and land use plans | Oregon, New Zealand |
| | Consultation mandate within planning and climate frameworks | Quebec, Oregon, New Zealand, California |
| | Integrating Indigenous worldviews and stewardship in planning | New Zealand, Oregon, California |

# References


1. Canadian Climate Institute. *Close To Home: How to Build More Housing in a Changing Climate.* https://climateinstitute.ca/wp-content/uploads/2025/02/Close-to-Home-Report-Canadian-Climate-Institute.pdf (2025).
2. Deschamps, B. & Boudreault, M. *How Can Municipalities in British Columbia and Quebec Contribute to Flood Risk Reduction?* 42 (2023).
3. UNDRR. *Sendai Framework for Disaster Risk Reduction 2015 - 2030.* https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030 (2015).
4. UN Habitat. *New Urban Agenda*. https://unhabitat.org/sites/default/files/2019/05/nua-english.pdf (2017).
5. UNDRR. *Promoting Land Use and Spatial Planning for Disaster Risk Reduction*. https://www.unisdr.org/files/globalplatform/5921ce80f200aBackground_Document_GP17_Session_-_Land-use_and_Spatial_Planning.pdf (2017).
6. US Climate Alliance. US Climate Alliance: About. *U.S. Climate Alliance* https://usclimatealliance.org/about/ (2026).
7. US Climate Alliance. *Climate and Land Use Planning: A Policy Guide for U.S. States and Territories.* https://usclimatealliance.org/wp-content/uploads/2025/02/USCA_ClimateandLandUsePlanningPolicyGuide_20250211-LowRes.pdf (2025).
8. Government of Canada. *Canada's National Adaptation Strategy: Building Resilient Communities and*

*a Strong Economy.* https://publications.gc.ca/collections/collection_2023/eccc/en4/En4-544-2023-eng.pdf (2023).

9. *Emergency Management Strategy for Canada: Toward a Resilient 2030*. (Public Safety Canada, Ottawa, ON, 2019).

10. Canadian Institute of Planners. *Policy on Climate Change Planning.* https://www.cip-icu.ca/national-policy-on-climate-change-planning/ (2025).

11. Federation of Canadian Municipalities. *Sustainable Land Use Practices in Canadian Municipalities: A Snapshot.* https://data.fcm.ca/documents/reports/GMF/2020/sustainable-land-use-practices-in-canadian-municipalities.pdf (2019).

12. Government of Canada. Canada in a Changing Climate: Regional Perspectives Report. https://changingclimate.ca/site/assets/uploads/2025/06/Regional-Perspectives-Report_EN.pdf (2022).

13. Government of British Columbia. *Local Government Act.* (2015).

14. Government of British Columbia. *Environmental Management Act.* (2003).

15. Government of British Columbia. *Land Use Planning in British Columbia: Planning Principes.* https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/policies-guides/mlup_planning_principles_may2024.pdf (2024).

16. West Coast Environmental Law. *Preparing for climate change : an implementation guide for local governments in British Columbia.* https://publications.gc.ca/site/eng/9.952192/publication.html (2012).

17. Struik, L. C. *et al. Risk-Based Land-Use Guide: Safe Use of Land Based on Hazard Risk*

*Assessment.* 7772 https://ostrnrcan-dostrncan.canada.ca/handle/1845/157178 (2015) doi:10.4095/295981.

18. Government of British Columbia. *Development Permit Areas for Climate Action: A Guide for Energy Conservation, Water Conservation and GHG Emissions Reduction.* https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/local-governments/planning-land-use/development_permit_areas_climate_action_guide.pdf (2011).

19. Government of British Columbia. *Modernizing Land Use Planning in British Columbia - Province of British Columbia.* https://www2.gov.bc.ca/gov/content/industry/crown-land-water/land-use-planning/modernizing-land-use-planning (2025).

20. Government of British Columbia. *Declaration on the Rights of Indigenous Peoples Act - Province of British Columbia.* https://www2.gov.bc.ca/gov/content/governments/indigenous-people/new-relationship/united-nations-declaration-on-the-rights-of-indigenous-peoples (2025).

21. Government of British Columbia. *Climate Preparedness and Adaptation Strategy: Actions for 2022-2025*. https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/cpas.pdf (2022).

22. Government of British Columbia. *Disaster Resilience and Innovation Funding program - Province of British Columbia.* https://www2.gov.bc.ca/gov/content/safety/emergency-management/local-emergency-programs/financial/drif.

23. Government of British Columbia. *From Flood Risk to Resilience: A B.C. Flood Strategy to 2035.* https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/integrated-flood-hazard-mgmt/bc_flood_strategy.pdf (2024).

24. Hoffman, K. M. *et al.* The right to burn: barriers and opportunities for Indigenous-led fire stewardship in Canada. *FACETS 7*, 464–481 (2022).

25. Government of British Columbia. Ministry of Emergency Management and Climate Readiness - Province of British Columbia. https://www2.gov.bc.ca/gov/content/governments/organizational-structure/ministries-organizations/ministries/emergency-management-and-climate-readiness (2026).

26. Government of British Columbia. Floodplain maps by region - Province of British Columbia. https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/integrated-flood-hazard-management/governance/flood-hazard-land-use-management/floodplain-mapping/floodplain-maps-by-region (2023).

27. Henstra, D. & Thistlethwaite, J. Overcoming Barriers to Meeting the Sendai Framework for Disaster Risk Reduction. *Cent. Int. Gov. Innov.* (2017).

28. Gouvernement du Québec. *Gagnant pour le Québec, gagnant pour la planète: plan pour une économie verte 2030. Politique-cadre d'électrification et de lutte contre les changements climatiques.* https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/environnement/publications-adm/plan-economie-verte/plan-economie-verte-2030.pdf (2020).

29. Gouvernement du Québec. *Politique nationale de l'architecture et de l'aménagement du territoire: plan de mise en œuvre 2023-2027.* https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/affaires-municipales/publications/amenagement_territoire/PNAAT/BRO_pmo_pnaat.pdf (2023).

30. Gouvernement du Québec. *Interpretation Guide - General Financial Assistance - Program Regarding Disasters.* https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/securite-

publique/publications-adm/publications-secteurs/securite-civile/aide-financiere/programme-2023/interpretation_guide_general_financial_assistance_2023.pdf (2023).

31. Vis, X. R. Are Canadians more afraid of floods — or flood maps? | The Narwhal. *The Narwhal* https://thenarwhal.ca/outdated-flood-maps-canada/ (2026).

32. Gouvernement du Québec. Schéma d'aménagement et de développement du Guide La prise de décision en urbanisme | Gouvernement du Québec. https://www.quebec.ca/habitation-territoire/amenagement-developpement-territoires/amenagement-territoire/guide-prise-decision-urbanisme/planification/schema-amenagement-developpement (2025).

33. Gouvernement du Québec. Fiches synthèses des défis et perspectives d'adaptation des régions aux changements climatiques | Gouvernement du Québec. https://www.quebec.ca/habitation-territoire/amenagement-developpement-territoires/amenagement-territoire/changements-climatiques-municipalites/fiches-defis-perspectives-regions (2025).

34. Gouvernement du Québec. Fiches de bonnes pratiques en aménagement du territoire dans un contexte de changements climatiques. *Gouvernement du Québec* https://www.quebec.ca/habitation-territoire/amenagement-developpement-territoires/amenagement-territoire/changements-climatiques-municipalites/fiches-pratiques (2025).

35. Gouvernement du Québec. Interprétation des cartographies de nouvelle génération des zones inondables et des zones de mobilité des cours d'eau. *Gouvernement du Québec* https://www.quebec.ca/agriculture-environnement-et-ressources-naturelles/eau/zones-

inondables-mobilite-rives-littoral/cartographies/en-vigueur/interpretation (2026).

36. OACIQ. Flood zones. *OACIQ* https://www.oaciq.com/en/broker/professional-practices-guides/environment/water-saturation-subsidence-and-flood-zones/flood-zones/ (2025).

37. Certificate of location | OACIQ. https://www.oaciq.com/en/broker/guidelines/guideline-verification-information-and-advice/1-duty-to-verify/information-on-the-immovable/certificate-of-location/ (2025).

38. Gouvernement du Québec. Programme OASIS. https://www.environnement.gouv.qc.ca/programmes/oasis/index.htm (2026).

39. Ordre des Urbanistes du Québec. *Déclaration Sur La Contribution de l'urbanisme à Une Nouvelle Relation Avec Les Peuples Autochtones.* https://ouq.qc.ca/wp-content/uploads/2023/11/ouq-declaration-reconciliation.pdf (2023).

40. Ontario Professional Planners Institute. *Practice Guide | Planning Legislative Framework in Ontario.* https://ontarioplanners.ca/inspiring-knowledge/planning-in-practice/planning-in-practice/practice-guide-planning-legislative-framework-in-ontario (2025).

41. Conservation Ontario. Land Use Planning // Conservation Ontario. https://conservationontario.ca/conservation-authorities/planning-and-regulations/land-use-planning (2026).

42. Gowling WLG. Reviewing the 2024 changes to Ontario's Conservation Authority Act | Gowling WLG. https://gowlingwlg.com/en-ca/insights-resources/articles/2025/reviewing-the-2024-conservation-authority-act (2025).

43. Government of Ontario. *Provincial Planning Statement, 2024.* https://www.ontario.ca/page/provincial-planning-statement-2024 (2024).

44. Ecojustice. Bill 5 puts profits before people, rights, and the environment. *Ecojustice* https://ecojustice.ca/news/ontarios-special-economic-zones-a-blank-cheque-for-environmental-harm/ (2025).

45. Government of Ontario. Flood hazard identification and mapping | ontario.ca. http://www.ontario.ca/page/flood-hazard-identification-and-mapping (2022).

46. Toronto and Region Conservation Authority (TRCA). Hurricane Hazel's Legacy. *Toronto and Region Conservation Authority (TRCA)* https://trca.ca/news/hurricane-hazel-70-years/ (2024).

47. Government of Ontario. Wildland Fire Risk Assessment and Mitigation Reference Manual | ontario.ca. http://www.ontario.ca/page/wildland-fire-risk-assessment-and-mitigation-reference-manual (2018).

48. Open Council. Restrictive covenants help municipalities prevent land banking - Open Council. https://opencouncil.ca/restrictive-covenants/ (2025).

49. Clean AIr Partnership. *Towards Low Carbon Communities: Creating Municipal Green Development Standards.* https://www.cleanairpartnership.org/wp-content/uploads/2020/10/GDS-toolkit.pdf (2020).

50. Government of Ontario. Ontario Community Environment Fund | ontario.ca. https://www.ontario.ca/page/ontario-community-environment-fund (2025).

51. Sustainability Solutions Group. *Toronto's Climate Risks: Understanding Vulnerability Today, Preparing for Tomorrow.* https://www.toronto.ca/wp-content/uploads/2025/11/97d0-Summary-ReportTorontos-Climate-Risks-Understanding-Vulnerability-Today-Preparing-for-Tomorrow-.pdf (2025).

52. Legislative Assembly of Ontario. Bill 198, Ontario Climate Change Adaptation and

Resilience Act, 2024 - Legislative Assembly of Ontario. https://www.ola.org/en/legislative-business/bills/parliament-43/session-1/bill-198 (2024).

53. Government of Oregon. Oregon Department of Emergency Management : Hazards in Oregon : Hazards and Preparedness : State of Oregon. https://www.oregon.gov/oem/hazardsprep/Pages/Hazards-in-Oregon.aspx (2025).

54. Government of Oregon. Department of Land Conservation and Development : Oregon's Statewide Land Use Planning Goals : Oregon Planning : State of Oregon. https://www.oregon.gov/lcd/op/pages/goals.aspx (2025).

55. Government of Oregon. Department of Land Conservation and Development : Land Use Planning and Climate Change : Climate Change : State of Oregon. https://www.oregon.gov/lcd/CL/pages/index.aspx (2026).

56. Oregon Department of Fish and Wildlife. *KCI Land Use Changes Review Draft.* https://dfw.state.or.us/SWAP-Revision/docs/KCI%20Land%20Use%20Changes%20Review%20Draft.pdf.

57. Government of Oregon. *Oregon Department of Land Conservation and Development Strategic Plan 2023-2031: 2025-2027 Update.* https://www.oregon.gov/lcd/Publications/2023-2031_Strategic_Plan_Signed.pdf (2025).

58. Government of Oregon. *Oregon Climate Change Adaptation Framework.* https://www.oregon.gov/lcd/CL/Documents/2021_CLIMATE_CHANGE_ADAPTATION_FRAMEWORKandBlueprint.pdf (2021).

59. Government of Oregon. Department of Land Conservation and Development : Land Use Planning and Climate Change : Climate Change : State of Oregon.

https://www.oregon.gov/lcd/CL/pages/index.aspx (2025).

60. Government of Oregon. Natural Hazards Mitigation Planning : Natural Hazards : State of Oregon. https://www.oregon.gov/lcd/nh/pages/mitigation-planning.aspx (2025).

61. Government of Oregon. Oregon Department of Emergency Management : Hazard Mitigation Planning : Plans and Assessments : State of Oregon. https://www.oregon.gov/oem/emresources/Plans_Assessments/Pages/hazard-mitigation-planning.aspx (2025).

62. Government of Oregon. Department of Land Conservation and Development : National Flood Insurance Program (NFIP) in Oregon : Natural Hazards : State of Oregon. https://www.oregon.gov/lcd/NH/Pages/NFIP.aspx (2025).

63. Megan Horst. *Oregon 2050: Land Use.* https://www.pdx.edu/urban-public-affairs/sites/urbanpublicaffairs.web.wdt.pdx.edu/files/2021-06/Land%20Use%2006_21.pdf.

64. Confederated Tribes of the Umatilla Indian Reservation. *Climate Change  Vulnerability Assessment.* https://static1.squarespace.com/static/50c23e29e4b0958e038d6bd6/t/57b4c5af6a496315610b2d86/1471464889144/CTUIR+Vulnerability+Assessment+Technical+Report+FINAL.pdf (2015).

65. California, S. of. Overview of the California Climate Adaptation Strategy - California Climate Adaptation Strategy. https://www.climateresilience.ca.gov/overview/index.html.

66. Government of California. General Plan Information - Office of Land Use and Climate Innovation. https://lci.ca.gov/planning/general-plan/ (2025).

67. Government of California. Integrated Climate Adaptation and Resiliency Program (ICARP) - Office of Land Use and Climate Innovation. https://lci.ca.gov/climate/icarp/#key-resources

(2026).

68. Government of California. Overview of the California Climate Adaptation Strategy - California Climate Adaptation Strategy. https://www.climateresilience.ca.gov/overview/index.html (2024).

69. California Department of Water Resources. Flood Management. *Government of California* https://water.ca.gov/Programs/Flood-Management (2025).

70. Government of California. Vulnerable Communities Platform. https://vcp.lci.ca.gov/ (2025).

71. California Department of Water Resources. FERIX Home. https://ferix.water.ca.gov/webapp/home.jsp (2026).

72. Government of California. California Wildfire Mitigation Program | California Governor's Office of Emergency Services. https://www.caloes.ca.gov/office-of-the-director/operations/recovery-directorate/hazard-mitigation/california-wildfire-mitigation-program/ (2025).

73. California Legislature. California Code, CIV 1103.2. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=CIV&sectionNum=1103.2.

74. Sorgen, J. *et al.* Tribal sovereignty in land use decision making: Evaluating cultural resource law in California. *Environ. Plan. E Nat. Space 8*, 861–886 (2025).

75. Government of California. Announcement: California Governor's Office of Land Use and Climate Innovation Announces Tribal Consultation Guidelines Update with Tribal Engagement at the Forefront - Office of Land Use of Climate Innovation. https://lci.ca.gov/news/2025/09-25.html (2025).

76. Government of California. *Executive Order N-82-20*. https://www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-.pdf (2020).

77. David Helvarg. Using Fire to Fight Fire: California Tribes' Cultural Burns Restore Land and Keep Flames at Bay. *NMAI Magazine* https://www.americanindianmagazine.org/story/using-fire-to-fight-fire (2021).

78. California Strategic Growth Council. *Tribal Capacity Building Pilot Program.* https://sgc.ca.gov/wp-content/uploads/20250514-TCBP_May_2025_Updated_Factsheet.pdf (2025).

79. Government of New Zealand. *National Climate Change Risk Assessment for New Zealand. Main Report = Arotakenga Tūraru Mō Te Huringa Āhuarangi o Āotearoa. Pūrongo Whakatōpū.* https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-main-report.pdf (2020).

80. Government of New Zealand. Resource Management Act 1991. *Ministry for the Environment* https://environment.govt.nz/acts-and-regulations/acts/resource-management-act-1991/ (2023).

81. Government of New Zealand. National policy statements. *Ministry for the Environment* https://environment.govt.nz/acts-and-regulations/national-policy-statements/ (2023).

82. New Zealand Natural Hazards Commission. About natural hazards cover » Natural Hazards Commission Toka Tū Ake. https://www.naturalhazards.govt.nz/insurance-and-claims/about-nhcover/ (2026).

83. Environment Foundation. Regional Councils • Environment Guide. https://www.environmentguide.org.nz/overview/statutory-bodies/regional-councils/ (2026).

84. Government of New Zealand. *National Policy Statement on Urban Development 2020.* https://environment.govt.nz/assets/publications/National-Policy-Statement-Urban-Development-2020-11May2022-v2.pdf (2022).

85. Government of New Zealand. New Zealand Coastal Policy Statement. *Ministry for the Environment* https://environment.govt.nz/acts-and-regulations/national-policy-statements/new-zealand-coastal-policy-statement/ (2025).

86. Government of New Zealand. *Urutau, Ka Taurikura: Kia Tū Pakari a Aotearoa i Ngā Huringa Āhurarangi = Adapt and Thrive : Building a Climate-Resilient New Zealand : Aotearoa New Zealand's First National Adaption Plan.* https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf (2022).

87. Environment Foundation. Urban Development Act 2020 • Environment Guide. https://www.environmentguide.org.nz/activities/land-use/urban-development-act-2020/ (2025).

88. Government of New Zealand. Coastal hazards and climate change guidance | Ministry for the Environment. https://environment.govt.nz/publications/coastal-hazards-and-climate-change-guidance/ (2026).

89. Government of New Zealand. Natural Hazards Portal: Home. https://www.naturalhazardsportal.govt.nz/s/ (2026).

90. Government of New Zealand. *Integrating Traditional Knowledge Systems and Cultural Values in Māori Land Use Planning.* https://www.mpi.govt.nz/dmsdocument/27025/direct (2014).

91. Government of New Zealand. Aotearoa New Zealand's first national adaptation plan. *Ministry for the Environment* https://environment.govt.nz/publications/aotearoa-new-zealands-

first-national-adaptation-plan/ (2022).

92. Government of New Zealand. *Integrating Te Ao Māori and Mātauranga Māori in Environmental Reporting.* https://environment.govt.nz/assets/publications/era-maori-engagement-infosheet.pdf (2022).