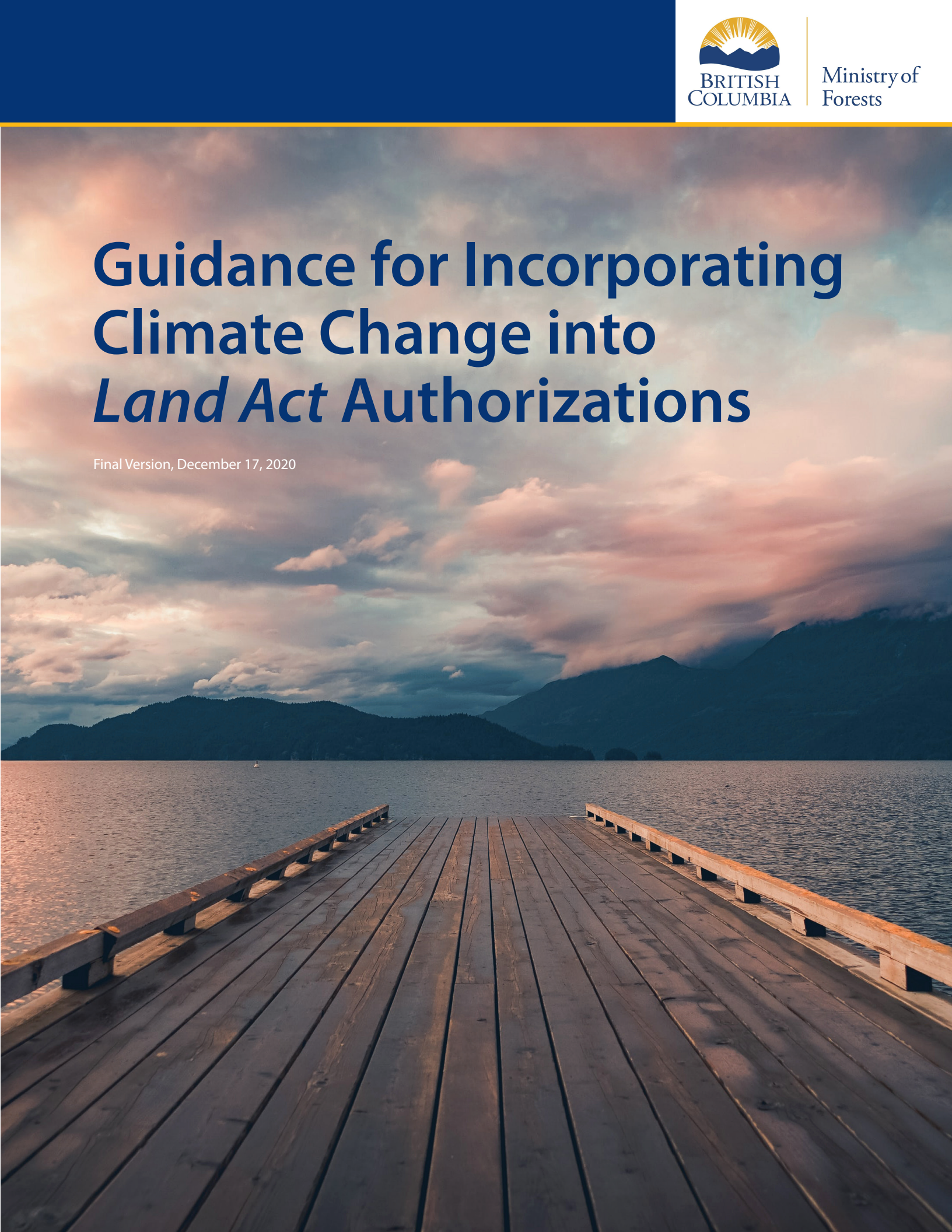


# Guidance for Incorporating Climate Change into *Land Act* Authorizations

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This document outlines the impacts of major climate change hazards/risks identified in the **Preliminary Strategic Climate Risk Assessment**<sup>1</sup> and potential adaptation measures for **Land Act** clients to consider incorporating into their projects. It is a living document and shall be updated periodically as new information and best adaptation practices come to light.

A wide range of activities are authorized under the *Land Act*. Consequently, the risks posed by climate change and appropriate mitigation measures will vary significantly from project to project.

Climate change will potentially increase cumulative impacts of land use on a variety of values including wildlife, aquatic ecosystems, water availability and biodiversity. For example, agriculture will be most affected by increased drought severity and frequency, spread of invasive species and regime shifts in ecosystems; alpine resorts and winter recreational activities may see higher altitude snow lines, decreased snow depth and a shorter winter season; while changed windstorm patterns and hydrological regimes could greatly impact clean energy. Additionally, climate change could intensify the severity of drought and flooding endangering public safety and infrastructure such as bridges, dikes, and dams.

The following table describes the trends and impacts of major natural hazards as well as possible adaptation measures. Applicants can use this information to develop project designs that mitigate the growing risks posed by these hazards. Lands staff and decision makers can use this guidance to inform their decisions and promote designs and uses that are resilient to climate change. Potential adaptation measures described here are provided as a general resource and do not override relevant provincial, local, or federal requirements or bind *Land Act* decision makers.

**Table 1. Examples impacts of major climate change hazards/risks and potential adaptation measures**

Climate change hazards/risks <sup>1</sup>	Provincial trend	Major impacts	Potential adaptation measures
Wildfire	annual area burned is projected to increase by up to 4% by 2050<?>	<ul style="list-style-type: none"><li>• damages forests and disrupts ecosystems</li><li>• displaces wildlife and transforms landscapes</li><li>• ash and debris may degrade water quality and cause damage to aquatic habitats<sup>1</sup></li><li>• produces carbon emissions</li><li>• destroys facilities including buildings and other infrastructures</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">FireSmart</a> buildings &amp; structures:<ul style="list-style-type: none"><li>» remove fuels</li><li>» renovate and build homes &amp; structures with fire-resistant materials and better access to roads, utilities and reliable water sources</li><li>» further details available at <a href="#">FireSmartBC</a></li></ul></li><li>• renovate, recycle and rebuild where possible rather than demolishing structures.</li><li>• construct fireguard or fuel break as applicable.</li></ul>

Climate change hazards/risks <sup>1</sup>	Provincial trend	Major impacts	Potential adaptation measures
<b>Severe Riverine Flooding</b>	<ul style="list-style-type: none"> <li>low likelihood but high-consequence event</li> <li>climate change could make 1 in 500 year Fraser River flood up to 5 times more likely (from 0.2% to 0.5–1% annual chance of occurrence) by 2050<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>natural resources could experience [severe] damage due to inundation, debris, and water and soil contamination</li> <li>recovery could take years<sup>1</sup></li> <li>the <a href="#">Fraser Basin Council</a> predicts that Fraser River flood would cost \$32.7 billion to the economy by 2100.</li> </ul>	<ul style="list-style-type: none"> <li>setback at least 30 metres from the natural boundary of watercourses</li> <li>Flood Construction Levels at an elevation greater than 3.0 vertical metres above the natural boundary of the watercourse</li> <li>reconsider locating in a low to moderate flooding location</li> <li>locate critical infrastructure upland or flood proof it</li> <li>more measures available at <a href="#">Flood Hazard Area Land Use Management Guidelines</a></li> </ul>
<b>Moderate Flooding (lower-level, more frequent than severe floods)</b>	climate change is expected to increase the frequency of lower-level floods <sup>1</sup>	<ul style="list-style-type: none"> <li>natural resources could experience damage due to inundation, debris, and water and soil contamination</li> <li>recovery could take weeks to months<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>setback at least 30 metres from the natural boundary of watercourses</li> <li>flood Construction Levels at an elevation above the natural boundary of the watercourse</li> <li>locate critical infrastructure upland or flood proof it</li> <li>more measures available at <a href="#">Flood Hazard Area Land Use Management Guidelines</a></li> </ul>
<b>Drought—seasonal water shortage</b>	projected to increase under climate change due to rising temperatures and changes in precipitation that could affect both rain and snowmelt dominated systems <sup>1</sup>	<ul style="list-style-type: none"> <li>degradation of wetland and forest habitats could affect many species.<sup>1</sup></li> <li>higher river temperatures could cause stress for temperature-sensitive species, especially salmon.</li> <li>recovery may take years &amp; millions of dollars<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>minimize water use</li> <li>increase water use efficiency</li> <li>develop water storage facilities</li> <li>more measures available at <a href="#">BC Drought Response Plan</a></li> </ul>



Climate change hazards/risks <sup>1</sup>	Provincial trend	Major impacts	Potential adaptation measures
<b>Drought—long-term water shortage</b>	higher temperatures are expected to increase evaporation and regional moisture deficit <sup>1</sup>	<ul style="list-style-type: none"> <li>• loss of natural Resources including agriculture, forestry, industry, recreation, human health, and ecosystems makes land and forests more susceptible to wildfires and insect outbreaks<sup>1</sup>.</li> <li>• recovery may take decades, and billions of dollars<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• reduce/restrict water use (<i>Water Sustainability Act</i>)</li> <li>• increase water use efficiency</li> <li>• develop permanent water reservoirs</li> <li>• divert water from annual crops to perennial and/or higher value crops</li> <li>• more measures available at <a href="#">BC Drought Response Plan</a></li> </ul>
<b>Severe Coastal Storm Surge</b>	<ul style="list-style-type: none"> <li>• moderate from 2010 to 2025</li> <li>• predicted to increase more quickly in the period leading up to 2100<sup>&lt;?&gt;</sup></li> </ul>	<ul style="list-style-type: none"> <li>• natural resources could experience erosion, temporary saltwater intrusion, or contamination due to flooding; recovery could take months.<sup>1</sup></li> <li>• 1m sea level rise (SLR) could displace &gt;1300 people &amp; affect &gt;450 businesses<sup>2</sup></li> <li>• 2m SLR could displace &gt;2700 people &amp; affect &gt;1900 businesses<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• setback at least 15 m from the future Estimated Natural Boundary</li> <li>• Flood Construction Levels above the future Estimated Natural Boundary</li> <li>• green wall (vegetation)</li> <li>• renovate, recycle and rebuild where possible rather than demolishing structures</li> <li>• further descriptions available at <a href="#">Guidelines for Management of Coastal Flood Hazard Land Use</a></li> </ul>

## Resources

Further information and resources are available at: <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resources-climate-change/natural-resources-climate-change-adaptation>. The [ClimateBC](#) web interface provides maps of historical and projected climates and allow users to obtain climate data for single locations in a more intuitive visual interface.

Similar guidance on GHG mitigation may be developed by the BC Ministry of Forests. Meanwhile, [A Guide to Green Choices](#) provides guidance for land use planning including reducing fossil fuel and concrete use, reduce deforestation and reduce amount of biomass burned during land clearing. Also, [BC's Energy Step Code](#) provides mitigation measures such as increasing building energy efficiency.

## Contacts

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