

# Hazard Resilience Index (HRI)

## *Hydrological Hazards (related to water and snow)*

Avalanches - Natural and Human Caused  
Flash Floods  
Ice Jam Floods  
Local Floods  
Rain Storm Floods  
Snow Melt Floods  
Glaciers  
Ice Floes, Icebergs, Ice Islands and Sea Ice  
Lake Outbursts

### Hydrological Hazards

Please refer to the *Hazard Resilience Index Instructions (HRI)* document for more information on using this document.

***In order to avoid repetition, resiliency factors that only apply to human-caused hazards are in italics.***

#### Avalanche – Natural and Human Caused

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Areas are forested or reforestation is in place in order to retain snow.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based avalanche exercises have taken place in the community-at-large (e.g., table-top or full-scale functional exercises).	<input type="checkbox"/>

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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Most persons (residents and visitors) using mountains for snow-related activities, outside ski resorts and privately monitored areas, frequently check with avalanche forecasting agencies such as the Canadian Avalanche Centre or contact experts to get avalanche risk reports based on depth of snow, precipitation and temperature and also incorporate traditional knowledge and practices related to avalanches.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Persons moving through mountainous areas by snowmobile, dog sled (qamutiq) or other form of transportation are prepared for and know how to protect themselves if their activities trigger an avalanche (e.g., carry a rescue beacon, a small shovel, avoid fresh accumulation and windblown snow which is less secure).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plans and personnel are in place to implement appropriate strategies to reduce avalanche hazards by triggering snow avalanches in a controlled environment and/or testing and promoting slope stability or similar strategy.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Plans are in place to identify areas with a high risk of experiencing an avalanche as off-bound areas for snowmobilers, skiers, and dog sleds (qamutiq) and there are the required personnel to mark and monitor use of this area.</i>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Regulations prohibit development, limit land use, or require structural reinforcements for buildings that must remain in avalanche hazard areas, such as reinforced walls and roofs; a plan also exists for the equivalent update/upgrade of existing structures/developments.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Structures are in place in avalanche runout and catchment zones such as diverters, catching dams or basins, retarding mounds (structures to stop debris), snow fences, snow nets, snow sheds or tunnels which slow, divert or stop avalanche flows.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has mapped and posted avalanche evacuation routes in areas of high risk in multiple languages (English, French, regionally appropriate Indigenous language).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community and mountain resorts have posted visible signs in multiple languages warning residents and visitors of avalanche hazards; warning signs are updated daily and shared on social media.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents and visitors of a potential avalanche and how to evacuate the threatened area and test the system regularly.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Emergency Response Personnel of a potential avalanche.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community members and organizations within the community (or nearby) have participated in and maintain Search and Rescue (SAR) training and certification.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Search and Rescue (SAR) volunteers of a potential or actual avalanche.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wind baffles (deflectors) are in place to direct wind in order to erode snow cover.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a means for consultation with Traditional Knowledge holders, community members, and subject matter experts about historical avalanche protection measures and appropriate prevention/control and response.	<input type="checkbox"/>

Flash Floods – Natural

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community monitors check frequently with weather forecasting agencies such as Environment Canada and monitor conditions that may lead to flash flooding to inform the issuance of warnings and watches.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based flash flood exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system to notify community residents of flash flood risk and to evacuate areas prone to flash flooding (e.g., river beds).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has implemented structural measures to reduce the risk of flooding, such as building dams, dykes and floodwalls, creating reservoirs or making channel improvements and these are regularly maintained.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has mapped areas subject to flash flooding and maps are available to residents.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has posted signs warning of areas subject to flash flooding (e.g., roads near waterways).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has regulations that prohibit development, limit land use, or require specific building codes for developments within flood hazard areas, such as elevating structures above maximum flood levels, requiring waterproof materials and anchoring buildings to prevent floatation; a plan also exists for the equivalent update/upgrade of existing structures/developments.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has retained or re-established natural ecosystems in floodplains that provide flood control, such as vegetation cover which provides soil stability and absorption, wetlands and estuaries (a partly enclosed coastal body of water with one or more rivers or streams flowing into it and a free connection to the sea) which assist with water retention and absorption, and natural stream flows and riparian areas (areas situated on the bank of a river or other body of water) which slow water runoff velocity, reduce bank erosion and reduce the introduction of sediment and debris in watercourses – consultation with Traditional Knowledge holders and subject matter experts is encouraged in the planning of these actions .	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents of a potential flash flood.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of a potential flash flood and to prohibit entry into areas subject to flash flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community members and organizations within the community (or nearby) have participated in and maintain Search and Rescue (SAR) training and certification.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Search and Rescue (SAR) personnel of a potential flash flood.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a means for consultation with Traditional Knowledge holders and subject matter experts about historical flood protection measures and appropriate prevention/control and response.	<input type="checkbox"/>

Ice Jam Floods – Natural

Hazard Resilience Rating      High Resilience       Low Resilience       Need More Info       Not Applicable

Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community monitors check frequently with weather forecasting agencies such as Environment Canada and monitor conditions that may lead to ice-jam flooding and share warnings.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based ice-jam flood training and exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community volunteers and personnel have received training regarding sand-bagging.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dredging has taken place to avert potential ice jam floods and/or dredging activities are monitored and assessed for their potential to cause submarine slides.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has implemented structural measures to reduce the risk of ice-jam flooding, such as building dams, dykes and floodwalls, creating reservoirs or making channel improvements.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a means for consulting Traditional Knowledge holders and subject matter experts about: appropriate prevention and responses to ice jams and also regarding possible impacts of structural response measures on wildlife and ecosystems.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has mapped areas subject to ice-jam flooding and shared maps with residents in multiple languages.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has posted signs warning of areas subject to ice jam flooding (e.g., roads, railroad lines near waterways).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has ready access to stockpiles of sandbags.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has regulations that prohibit development, limit land use, or require specific building codes for developments within ice-jam flood hazard areas, such as elevating structures above maximum flood levels, requiring waterproof materials and anchoring buildings to prevent floatation; a plan also exists for the equivalent update/upgrade of existing structures/developments.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has retained or re-established natural ecosystems in floodplains that provide flood control, such as vegetation cover which provides soil stability and absorption, wetlands and estuaries (a partly enclosed coastal body of water with one or more rivers or streams flowing into it and a free connection to the sea) which assist with water retention and absorption of spring rainwater and meltwaters.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Consult with traditional knowledge holders and subject matter experts to find out locations prone to ice jams in order to inform land use and development planning and reduce risk of flooding to property.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents of a potential ice jam flood and to evacuate areas prone to ice-jam flooding (e.g., areas near bridges, below steep rapids or in river bends).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of a potential ice jam flood and to prohibit entry into areas subject to ice jam flooding.	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community members and organizations within the community (or nearby) have participated in and maintain Search and Rescue (SAR) training and certification.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Search and Rescue (SAR) personnel of a potential ice jam flood.	<input type="checkbox"/>

Local Floods – Human-Caused

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community public works department has developed and implemented measures to reduce the risk of local flooding, such as ensuring that storm sewage drains and systems are well maintained and free from blockages caused by ice, mud or other debris/garbage.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community monitors and maintains pumps and pump stations.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has ready access to stockpiles of sandbags.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community monitors check frequently with weather forecasting agencies such as Environment Canada and monitor conditions that may lead to local flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community volunteers and personnel have received training regarding sand-bagging.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based local flood exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a warning system, using various means of communication including social media, to notify community residents and businesses of potential local flooding risk and to evacuate areas prone to local flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has retained or re-established natural ecosystems in floodplains that provide flood control, such as vegetation cover which provides soil stability and absorption, wetlands and estuaries (a partly enclosed coastal body of water with one or more rivers or streams flowing into it and a free connection to the sea) which assist with water retention and absorption, and natural stream flows and riparian areas (areas situated on the bank of a river or other body of water) which slow water runoff velocity, reduce bank erosion and reduce the introduction of sediment and debris in watercourses.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of potential local flooding and to prohibit entry into areas subject to ice jam flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a means to consult with Traditional Knowledge holders, community members and subject matter experts regarding local flooding and history of development as it relates to flooding occurrence.	<input type="checkbox"/>

## Rain Storm Floods – Natural

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community officials check frequently with weather forecasting agencies such as Environment Canada and monitor conditions that may lead to rain storm flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community volunteers and personnel have received training regarding sand-bagging.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based rain storm flood exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dredging has taken place to avert potential ice jam floods and/or dredging activities are monitored and assessed for their potential to cause submarine slides.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has implemented structural measures to reduce the risk of rain storm flooding, such as building dams, dykes and floodwalls, creating reservoirs or making channel improvements.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a means for consulting Traditional Knowledge holders and subject matter experts about: appropriate prevention and responses to rainstorm floods and also regarding possible impacts of structural response measures on wildlife and ecosystems.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has mapped areas subject to rain storm flooding (e.g., established flood plain areas at the 100 and 200 year level) and shared it with residents.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has posted signs in multiple languages warning of areas subject to rain storm flooding (e.g., roads, railroad lines near waterways).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has ready access to stockpiles of sandbags.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has regulations that prohibit development, limit land use, or require specific building codes for developments within flood plains, such as elevating structures above maximum flood levels (e.g., 100 or 200 year levels), requiring waterproof materials and anchoring buildings to prevent floatation; a plan also exists for the equivalent update/upgrade of existing structures/developments.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has retained or re-established natural ecosystems in floodplains that provide flood control, such as vegetation cover which provides soil stability and absorption, wetlands and estuaries (a partly enclosed coastal body of water with one or more rivers or streams flowing into it and a free connection to the sea) which assist with water retention and absorption, and natural stream flows and riparian areas (areas situated on the bank of a river or other body of water) which slow water runoff velocity, reduce bank erosion and reduce the introduction of sediment and debris in watercourses.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents of a potential rain storm floods and to evacuate areas prone to rain storm flooding (e.g., flood plains) or other appropriate responses when evacuation is high risk, such as moving to safe space in home where flood waters will not affect you.	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of a potential rain storm flood and to prohibit entry into areas subject to flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community members and organizations within the community (or nearby) have participated in and maintain Search and Rescue (SAR) training and certification.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Search and Rescue (SAR) personnel of a potential rain storm flood.	<input type="checkbox"/>

### Snow Melt Floods

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community officials check frequently with weather forecasting agencies such as Environment Canada and monitor snow pack conditions that may lead to snow melt flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community volunteers and personnel have received training regarding sand-bagging.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based snow melt flood exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dredging has taken place to avert potential ice jam floods and/or dredging activities are monitored and assessed for their potential to cause submarine slides (to be done in ice-free times).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has implemented structural measures to reduce the risk of snow melt flooding, such as building dams, dykes and floodwalls, creating reservoirs or making channel improvements.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has a means for consulting Traditional Knowledge holders and subject matter experts about: appropriate prevention and responses to snow melt floods and also regarding possible impacts of structural response measures on wildlife and ecosystems.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has mapped areas subject to snow melt flooding (e.g., established flood plain areas at the 100 and 200 year level and marked low-lying areas) and shared maps with the community.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has ready access to stockpiles of sandbags.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has regulations that prohibit development, limit land use, or require specific building codes for developments within flood plains, such as elevating structures above maximum flood levels (e.g., 100 or 200 year levels), requiring waterproof materials and anchoring buildings to prevent floatation; a plan also exists for the equivalent update/upgrade of existing structures/developments.	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has retained or re-established natural ecosystems in floodplains that provide flood control, such as vegetation cover which provides soil stability and absorption, wetlands and estuaries (a partly enclosed coastal body of water with one or more rivers or streams flowing into it and a free connection to the sea) which assist with water retention and absorption, and natural stream flows and riparian areas (areas situated on the bank of a river or other body of water) which slow water runoff velocity, reduce bank erosion and reduce the introduction of sediment and debris in watercourses.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community monitor consults with Elders and Traditional Knowledge holders regarding the ways Indigenous peoples have controlled or prevented floods in the past.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is an early warning system in place to notify farmers of potential snow melt floods and to evacuate livestock from areas prone to snow melt flooding (e.g., flood plains).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents of a potential snow melt floods and to evacuate areas prone to snow melt flooding (e.g., flood plains).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of a potential snow melt flood and to prohibit entry into areas subject to flooding.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community members and organizations within the community (or nearby) have participated in and maintain Search and Rescue (SAR) training and certification.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Search and Rescue (SAR) personnel of a potential snow melt flood.	<input type="checkbox"/>

### Glaciers and Glacier Avalanches

**Hazard Resilience Rating**      High Resilience       Low Resilience       Need More Info       Not Applicable

Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community officials check frequently with weather forecasting agencies such as Environment Canada and monitor glacier conditions that may lead to avalanches associated with glaciers.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based discussions, including Traditional Knowledge holders, have taken place in the community-at-large regarding glaciers of concern and safety around glaciers.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community and mountain resorts have posted visible signs in multiple languages warning residents and visitors of avalanches associated with glaciers and marking areas of the glacier safe for visitors (if any).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has plans in place or has reduced the risk of glacial lakes flooding by constructing a draining tunnel to remove water from the lake and away from any settlements or development (e.g., roads).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has plans in place to reduce the risk of a glacier avalanche by controlled ice blasting or having snow sheds in place to protect roads and other areas.	<input type="checkbox"/>



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has plans in place to reduce the risk of portions of glaciers breaking off such as controlled ice blasting.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community monitors glaciers with annual aerial photos and/or surveillance cameras to see changes and potential risks and shares information with residents to keep them informed.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents and visitors of a potential avalanche associated with glaciers and to evacuate the threatened area.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of avalanche risks associated with glaciers.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based glacier avalanche evacuation exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>

Icebergs, Ice Islands and Sea Ice

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based marine accidents involving icebergs, ice islands or sea ice exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community officials check frequently with weather forecasting agencies such as Environment Canada and monitor icebergs, ice islands or sea ice conditions that may lead to marine accidents.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based discussions, including Traditional Knowledge holders, have taken place in the community-at-large regarding ice bergs, ice islands and sea ice.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Most community members who hunt and fish at the floe edge or operate boats around sea ice have been given safety training (related to polar bears, ice conditions and safe boating in ice infested waters) and carry appropriate safety gear (survival suits, rescue equipment for pulling people from the water etc.) and communication mechanisms (radio or other); hunting and fishing is always done in teams of two or more and trip plans are left with a family member in case rescue is needed.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community members and organizations within the community (or nearby) have participated in and maintain Search and Rescue (SAR) training and certification; access to some appropriate rescue vehicles is also available.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify Search and Rescue vessels (marine or helicopter) in case a community member is caught on an ice floe.	<input type="checkbox"/>

Lake Outburst

<b>Hazard Resilience Rating</b>	High Resilience <input type="checkbox"/>	Low Resilience <input type="checkbox"/>	Need More Info <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Yes	No	Need More Info	Not Applicable	FACTORS	This factor is important to my community
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community officials check frequently with geological agencies such as Natural Resources Canada and monitor landslide conditions that may lead to lake outbursts.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community officials check frequently with weather forecasting agencies such as Environment Canada and monitor glacier dam conditions and slope stability around glacier lakes to identify places where lake outbursts could occur.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Community-based lake outburst exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises)	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community and mountain resorts have posted visible signs in multiple languages warning residents and visitors of the potential for lake outbursts associated with glaciers.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has plans in place or has reduced the risk of lake outbursts by removing water from glacial lakes or implementing controlled breaches, overflows, engineered outlet channels, siphoning or other approaches gathered from Traditional Knowledge holders and subject matter experts.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community has plans in place to reduce the risk of a glacier avalanche by controlled ice blasting or having snow sheds in place to protect roads and other areas.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The community monitors glaciers and glacial lakes with annual aerial photos and/or surveillance cameras to see changes and potential risks and to create hazard maps to inform land use planning and development.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify community residents and visitors of a potential lake outburst associated with glaciers and to evacuate the threatened area.	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is a warning system in place to notify emergency response personnel of potential lake outbursts associated with glaciers.	<input type="checkbox"/>

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