



Interior Health

Climate Change, Health and Well-being



Medical Health Officer Report 2023 | Interior Health Region

Acknowledgments



Land Acknowledgment

Interior Health provides health and wellness services across the ancestral, unceded and traditional territories of the Dākelh Dené, St'át'imc, Syilx, T̓silhqot'in, Ktunaxa, Secwépemc and Nlaka'pamux Nations. We honour the First Nations as the traditional stewards of these lands and waters.

Partnerships

Interior Health recognizes the Métis Nation British Columbia (MNBC), the 15 Métis Chartered Communities within the Interior, Métis and urban and 'away from home' Indigenous Peoples who contribute to the diverse landscape of Indigenous knowing and being in this region. Interior Health promotes and supports health equity for all First Nations, Métis and Inuit peoples.

Approximately 80 per cent of Indigenous Peoples seeking services from IH are Indigenous Peoples living in urban settings or away from their home communities.

Whenever possible, we distinguish between First Nations, Métis and Inuit, recognizing that they are distinct peoples with unique cultures, histories, rights, laws and governments, with specific rights, interests, priorities and concerns.

Our thanks and gratitude go to the many dedicated people who contributed to this report, including those who collected and analyzed the data, reviewed the draft, and provided input throughout the development of this report.



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Contents



Acknowledgments.....2	Reducing Climate Vulnerabilities through Action.....12	Extreme Heat.....16	Strengthening Community Resilience to Climate Change.....42	Recommendations.....45
Message from Dr. Sue Pollock, Medical Health Officer5	Community Resilience in Action.....13	Cold Weather.....23		Appendices.....47
Executive Summary.....6		Flooding.....28		References.....49
Reflections from the 2023 Wildfire Season.....7		Wildfires and Smoke.....35		
Climate Change and Health Overview.....8		Drought.....36		
Climate Change and Indigenous Peoples.....9				

Introduction

IN THIS SECTION:

Message from Dr. Sue Pollock	5
Executive Summary	6
Reflections from the 2023 Wildfire Season	7
Climate Change and Health Overview	8
Climate Change and Indigenous Peoples	9

Message from **Dr. Sue Pollock,** Medical Health Officer



As I write this message, fall has arrived, and the cooler temperatures and rainfall are a welcome relief to the Southern Interior communities that were impacted by wildfires just two months ago. Solastalgia is the homesickness you have when you are still at home.¹ I experienced solastalgia in the summer of 2023 as I witnessed the lands and infrastructure burning in my hometown. My family and I evacuated our home on August 18, 2023, exactly 20 years after my parents evacuated my childhood home during the 2003 Okanagan Mountain Park Fire. Twenty-twenty-three set records for the number and intensity of wildfires, and followed other record-setting years including 2021's heat dome and atmospheric river.

The 2023 Medical Health Officer Report was planned prior to the summer of 2023—and never has the imperative for action been greater.

This report presents data and information that illustrate climate change is a major threat to both the health of humans and the planet. The intent of this report, however, is not to cause fear, but to demonstrate that the climate crisis presents an opportunity—an opportunity to learn from Indigenous Knowledge Keepers, address health inequities, and collaborate across all sectors

through policy development and collective action to tackle the most significant global challenge of our times.

Climate change is strongly linked to health inequities. Communities and populations that are most vulnerable to the impacts of climate change are often those that contribute least to the problem. Indigenous Peoples are especially sensitive to the impacts of climate change given their connection to the natural world: lands, water, plants and animals. Upholding Indigenous rights and incorporating Indigenous knowledge and perspectives are critical to solving the climate crisis.

The report includes stories of innovation and resilience from across the region that Interior Health serves, a vast geographic area that includes 54 First Nations communities, 15 Chartered Métis Communities, 59 municipalities and 10 regional districts. These stories are intended to inspire action and present creative solutions at the community level. The audience for this report is broad, and includes various levels of government, the health sector, community partners and citizens of the Interior Health region.

My hope is that you come away with a deeper understanding of the relationship between climate change and health—your own health, our children's health, the health of our Elders and the health of our planet. I ask that you explore the recommendations section in the report, and decide where and how you can act, individually and collectively.

While the challenge of the climate crisis may seem insurmountable, we must continue to urgently move forward to mitigate and adapt to climate change, putting health front and centre. While communities will rebuild, we must learn lessons from recent climate events and mobilize together to prepare for the future.

Storytelling is a climate solution. It's a powerful way to find common ground, instill hope in others and motivate action. Everyone has a story to share about climate change. I encourage you to share yours.

Dr. Sue Pollock,
Medical Health Officer

Executive Summary

Climate change is a global issue affecting social, economic and environmental factors that determine our health: clean air, safe drinking water, secure and safe places to live, and income and livelihood.

The World Health Organization has identified climate change as the biggest health threat facing humanity.

In the Interior Health region, climate change has become a lived reality, especially when considering the heat, flooding, drought and wildfire events of recent years. These events have had measurable impacts on the health and well-being of communities in our region.

Moving forward, we can expect the mean annual temperature in B.C. to continue to increase. This overall warming trend and associated changes will drive several climate change hazards in our region, including extreme heat, cold, drought, flooding, wildfires, and smoke.

However, communities across the Interior Health region are investing in collaborative climate actions. When efforts to reduce climate risks are coordinated across sectors, there are many social, economic and cultural benefits that support individual and community health while benefitting our environment and climate.

We all have a role to play. To be effective, efforts to address and mitigate climate change impacts need to be a shared responsibility across all levels

of governments and communities, and include both public and private organizations. These approaches ensure climate actions are responsive to local climate risks, and promote and protect health and well-being across the community. This report provides an overview of the health status of communities in the Interior Health region as related to climate change.

The report also highlights the co-benefits of climate adaptation action, Interior Health's role as a collaborative partner in this work, and community-level actions across the region related to climate hazards: extreme heat, cold, flooding, drought, wildfires and smoke.

Recommendations for Actions

Interior Health

Fulfill health sector commitments to climate change as outlined in the [Interior Health Indigenous Health and Wellness Strategy](#) and the IH-MNBC Métis Health and Wellness Plan.

Implement actions within the [Climate Change and Sustainability Roadmap](#) and fulfill commitments to B.C.'s [Climate Preparedness and Adaptation Strategy](#) and [CleanBC Roadmap](#) to 2030.

Apply what was learned from the 2023 wildfire season and past years to health sector preparedness and response to climate-related events.

Create and endorse policies and programs that promote the co-benefits of health system action on climate change.

Community Partners

Support Indigenous-led actions to adapt to climate change and protect the natural environment.

Partner with Interior Health on climate change and health vulnerability and adaptation assessments, including implementation of adaptation plans.

Work in partnership with IH and other partners on extreme heat, cold, flooding, drought, wildfire and smoke preparedness and response that will help ensure health and well-being for all citizens.

Endorse policies and programs that build on community assets and promote the co-benefits of climate action on health and well-being.

Provincial Partners

Centre discussions in alignment with Indigenous perspectives and invite these voices and contributions.

Align vision and goals on climate change across provincial ministries and establish an integrated systems approach to climate change mitigation and adaptation.

Strengthen and formalize provincial climate change and health governance structures to streamline accountability and provide effective support for community level actions.

Ensure equitable allocation of resources to communities and populations that are most impacted by climate change, or have lesser means to prepare and respond, and ensure their experiences are reflected in provincial and regional solutions.

Coordinate health assessments and surveillance in relation to climate change and health, including qualitative and quantitative data and other forms of knowledge.

Reflections from the 2023 Wildfire Season

A report focused on climate change, health and well-being in the Interior Health region would not be complete without reflecting on the events and experiences of the 2023 heat and wildfire season.

The 2023 wildfire season had destructive and devastating impacts to the people, places and ecosystems across Canada. An ongoing series of wildfires spread across British Columbia, the Northwest Territories, Alberta, Ontario, Québec and Nova Scotia.

Between April and October 2023, following periods of drought and above-average temperatures, there were 914 wildfires within and immediately surrounding the Interior Health region, burning approximately 300,000 hectares.

More than 6,000 people throughout the region were required to leave their homes and communities to escape the wildfires. Upon their return, people were faced with the reality that their homes and properties had been burned or significantly impacted by the wildfires. The wildfires damaged critical community infrastructure, including 88 provincially regulated drinking water systems: 44 systems were placed on boil water notice, and eight systems were under a do not consume advisory.

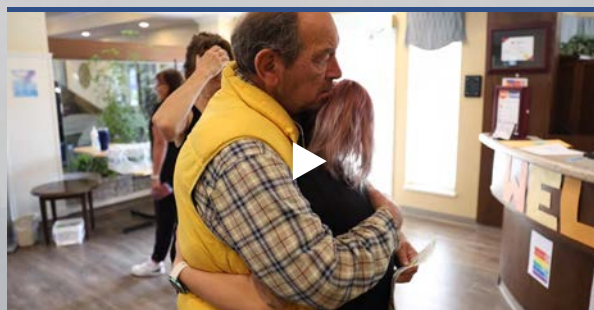
Many people were and have been displaced from their home communities for extended periods due to damage to community infrastructure and ongoing safety risks. At the time of writing this report, in mid-October, three First Nation communities remained on evacuation alert or order due to wildfires, including the Lower Similkameen Indian Band, Skwlāx te Secwepemcúłecw and Lytton First Nation. For Lytton First Nation in particular, this long-term displacement is compounded by the months already spent away from home because of wildfires and flooding in 2021 and 2022.

“We were away from our home for months first because of the wildfire in summer 2021 and then months later because of the floods. The loss of ceremonies affected our family and community, and we weren’t able to come together in a way we are used to.”

– *Nlaka’pamux Elder*

The 2023 wildfire season, along with extended periods of poor air quality due to the wildfires, also had an impact on people who were unhoused or living in encampments. Combined with the effects of the ongoing housing crisis in many communities, people who were unhoused struggled to access appropriate indoor spaces for relief from the smoke.

Interior Health responded quickly to the wildfires. Between August and September 2023 alone, more than 395 Interior Health staff were actively involved in response activities, many of whom were evacuated themselves. Interior Health safely evacuated 988 long-term care residents from 10 sites to other locations across B.C. Within the childcare community, 25 licensed childcare facilities were closed in evacuated areas. This created additional stress and challenges for IH staff and others with children at these facilities. In the face of emergencies, there have been many stories and examples of community resilience and collaborative action throughout our region. It is our hope that this report will inspire future climate action and help continue to build our climate resiliency.



Wildfire Emergency Response

August - September 2023



Wildfire Facts

13,970

Hectares burned

6,000+

Registered evacuees

180

Firefighter personnel

300

Highest air quality index reached

*anything over 100 is considered unhealthy, with 250+ being dangerous

6

Helicopters deployed

28

Pieces of heavy equipment



Staff and Facilities

395

IH employees involved in the wildfire response

7,100

Total IH staff hours worked related to wildfire response

10

Sites evacuated

32

Receiving sites

175+

Trips to evacuate and return residents

988

Long-term care residents evacuated



IH Logistics

10

IH info bulletins issued

253

Calls received to the emergency evacuation line

37

Mattresses moved

59

Beds moved

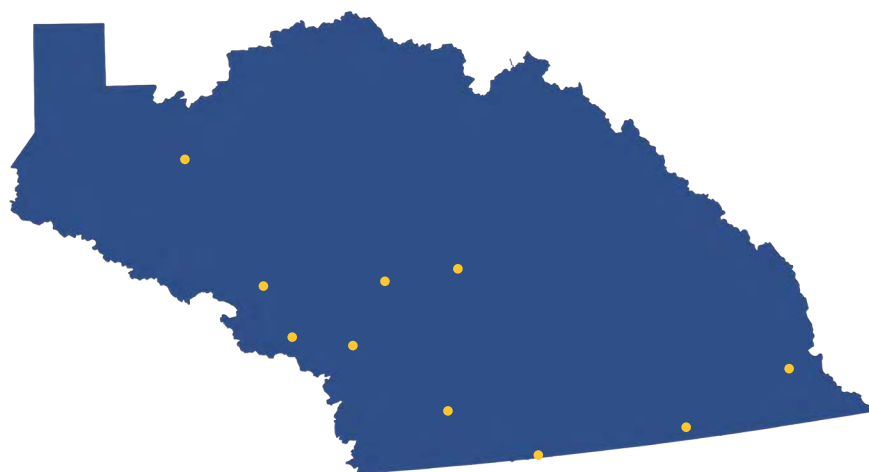
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Incident command centres

B.C. experienced its worst wildfire season on record in 2023 which required the support and assistance of many people at IH. Data is approximate and gathered from August 1 to September 22, 2023.

Climate Change and Health Overview

Case Studies: Click on the map to see examples of community action.



The World Health Organization (WHO) has identified climate change as the biggest health threat facing humanity. Climate change is a global issue affecting both social and environmental factors that determine our health: clean air, safe drinking water, secure and safe places to live, and income and livelihood.³

The issue of climate change is global in two ways. First, the drivers of climate change—human activities that cause greenhouse gas emissions—take place all over the planet. Second, the effects of climate change have an impact on the whole planet.

In the coming years, we can expect an increasing number of people to be displaced from areas of the world that are significantly impacted by sea-level rise, extreme weather events, drought and water scarcity. Many of these people may seek refuge in Canada, and in B.C., in particular.

In the last 10 years, our region has experienced significantly damaging climate-related hazards that have affected our health and well-being. We can expect the mean annual temperature in British Columbia to continue to increase.

This overall warming trend and associated changes will drive several climate change hazards in our region, including extreme heat, cold, flooding, drought, wildfires and smoke.

These hazards will continue to affect communities in our region for decades to come, and lead to numerous negative health outcomes, including death, injury, trauma, stress, anxiety and exacerbation of chronic health conditions.⁵ As well as these direct health outcomes, climate change can have indirect effects by impacting social, environmental, economic and cultural factors that influence our health.⁵

While everyone will be affected by climate change hazards, not all individuals are equally at risk. Health inequities and climate change are deeply interconnected. Health inequities refer to measurable differences in health outcomes between groups, communities and populations.

Though some differences in health outcomes are due to biological or genetic factors, most health differences are the result of underlying conditions needed for good health.⁵

These include the social, economic and environmental conditions and the imbalances of power that put groups who already experience disadvantages at further risk of poor health outcomes.⁶

Like health inequities, climate change is impacting some people more than others and this a result of societal issues that are systematic, unfair and avoidable or modifiable.⁶

To protect our own health, and the health of our children, grandchildren and the planet, we must do more than only respond to climate crises in the moment.

Locally, we have the power to take urgent collaborative action to build climate resilience. We can do so by developing and implementing effective climate adaptation actions to prepare individuals and communities for current and future climate-related events, and to build resilient health systems.⁷

By investing in and implementing adaptive measures to improve health (as outlined in this report), we can reduce the number of lives lost or harm caused by climate change, and decrease costs associated with the effects of climate change.⁸

This report provides an overview of the health status of communities in the Interior Health region as related to climate change. We also highlight the co-benefits of climate adaptation action, Interior Health's role as a collaborative partner in this work, and community-level actions across the region related to climate hazards: extreme heat, cold, flooding, drought, wildfires and smoke.

Climate Change and Indigenous Peoples

Indigenous Peoples are closely connected to their land and water, and each holds immense cultural and spiritual significance. Language also plays a central role in conveying ecological knowledge and ways of life over generations.

First Nations

First Nations people have inherent territory and title rights in what is known as British Columbia that pre-existed before settler contact and continue to exist. It is essential that these rights are upheld and that Interior Health acknowledges First Nations as the Community Governments in the best position to lead and collaborate with regarding climate change response and planning.

Colonial governments in what is known as Canada have committed to reconciliation by upholding and implementing the [United Nations Declaration on the Rights of Indigenous Peoples](#) and BC's Declaration of Rights of Indigenous Peoples Act (DRIPA). DRIPA has outlined the need to have a distinctions-based approach, working independently with First Nations, Métis, and Inuit to reflect the unique histories, culture, rights and needs of each Indigenous population. There is a [commitment](#) to respect and recognize the inherent rights First Nations people have as original caretakers of these lands to self-determination and self-governance for decision making related to the land and water.

First Nation communities are uniquely affected by climate change due to colonial systems, such as the imposed land reserve system. The reserve system fragmented large traditional territories into small parcels of land that were often established in areas that were not desirable to colonial governments—on floodplains or in an area downstream from a major industrial development, for example.

This colonial system contributes to increased climate vulnerability among First Nation communities and disrupted cultural practices and ways of living on the land.⁵

The current Western worldview, focused on owning and controlling resources continues to disrupt First Nation connections to the land. Colonial systems, socio-economic inequities, and ongoing systemic discrimination continue to oppress First Nations and increases their susceptibility to negative and cumulative climate-related effects, which are detailed throughout this report.⁵

Despite the many challenges, First Nation communities are uniquely resilient because of the cultural and intergenerational knowledge and values passed on through language and cultural practice, as well as through Elders and Knowledge Keepers. This knowledge comes from deep relationship and connections to the land and water. Valuable First Nation knowledge systems have continued to evolve and are responsive to changing ecosystems and can inform Western science.⁵

Many First Nation communities across the Interior are implementing climate adaptation and mitigation efforts in response to the changing climate, while also strengthening First Nations governance and rights. Actions that are First Nations-led or co-created with First Nation communities can offer a more holistic approach compared to the disciplinary approach more often used in Western science.⁹

For examples of First Nations-led climate action within this report, refer to:

- [Títqet Response to Local Climate Change Impacts](#)
- [Yaqaṇ Nuʔkiy Wetlands Restoration](#)
- [Indigenous Knowledge Systems with Western Science for Forest Management – Yunešit'in and Xení Gwet'in First Nations](#)
- [Kanaka Bar Climate Action](#)



[Watch on YouTube - The suknaʔqínʔ \(Okanagan\) is Beautiful](#)



Listen to [Interior Voices podcast](#) episode with Chief Byron Louis from Okanagan Indian Band to learn more about how climate change is affecting First Nation communities.

Climate Change and **Indigenous Peoples**



Métis

Métis have settled and live in what is known as British Columbia over the past few hundred years. Métis are considered guests on the traditional lands of the First Nations in what is known as British Columbia.

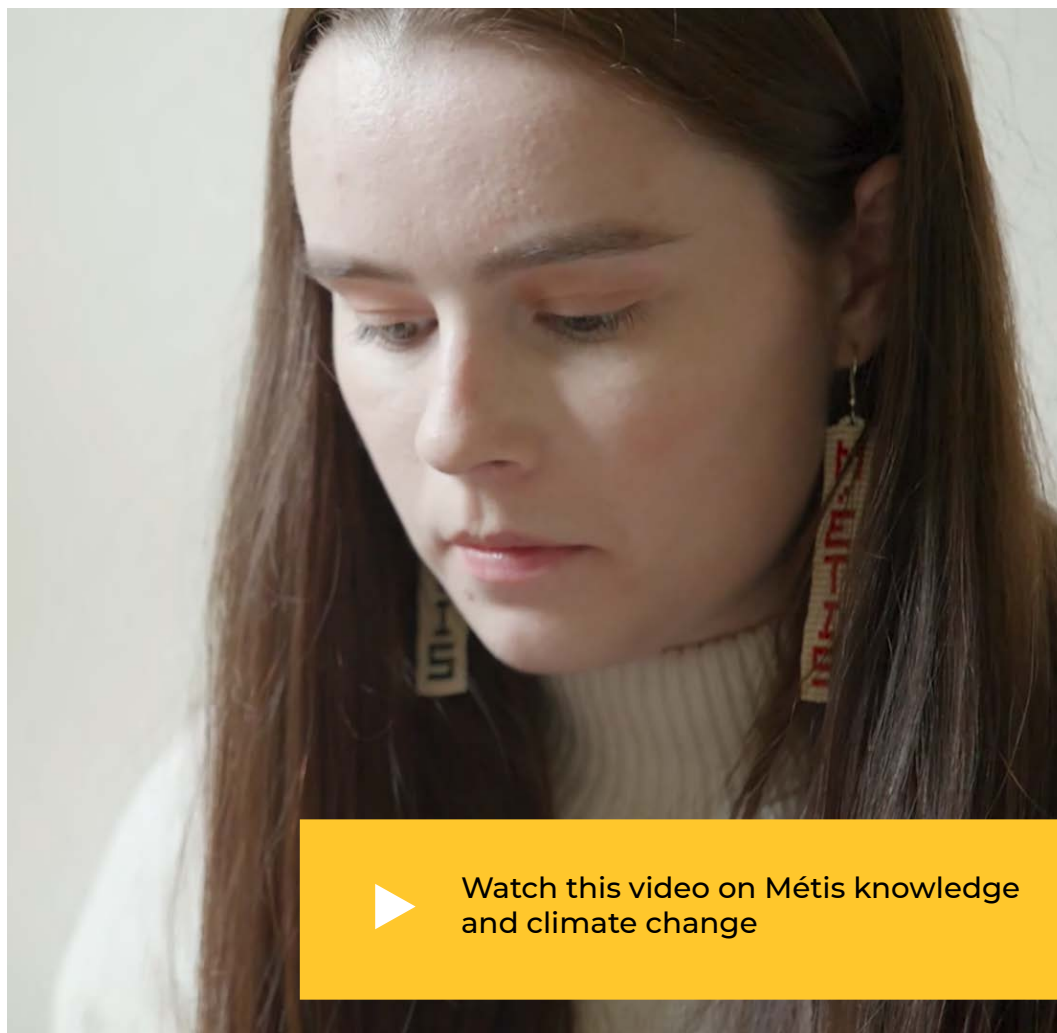
It is important to recognize and value Métis culture and language that will strengthen healthy Métis communities.

Métis people in what is known as British Columbia have been negatively impacted by both historic and ongoing systemic racism, the residential school system, the Sixties Scoop and other colonial policies. As a result, many were discouraged from passing traditional knowledge, culture and teachings to their children and grandchildren.

There is a need to build climate resilience such as mental health and cultural wellness in the face of extreme weather events and improve food security amidst rising food costs.

For more information on climate change and Indigenous Peoples:

- [Canada in a Changing Climate – Regional Perspectives \(2022\)](#) ↗
- [Climate Change and Indigenous Peoples in Canada: Health Impacts \(2022\)](#) ↗
- [Indigenous Knowledge and Climate Change | Climate Atlas of Canada](#) ↗
- [BC First Nations Climate Strategy and Action Plan \(2022\)](#) ↗
- [Metis Nation British Columbia Climate Change & Food Access Survey Report \(2023\)](#) ↗



Case for Change

IN THIS SECTION:

Reducing Climate Vulnerabilities through Action 12

Community Resilience in Action:
The Ktunaxa Nation community of ʔaqam 13

Reducing Climate Vulnerabilities through **Action**

Some people are more vulnerable to climate change impacts based on their exposure to climate change hazards, sensitivity to impacts, and the capacity to respond to, or cope with hazards.⁵ These factors of vulnerability are also known as exposure, sensitivity and adaptive capacity and can be used to understand why some individuals and communities are more vulnerable to the effects of climate change. When we take immediate action to support people who are most vulnerable, we can enhance our collective capacity for climate resilience and adaptation. The factors that make individuals and populations vulnerable to climate change can overlap with other factors

that determine our health, including income, employment, living and working conditions, and structural systems of oppression (e.g., colonization, racism, ableism, etc.)^{5,8}. This overlap is particularly prominent in the factors that contribute to adaptive capacity. For example, socio-economic status, employment, housing and access to community services—factors that influence health and well-being—are also factors that influence how well an individual or population can respond and adapt to climate change.

Adaptive capacity can be modified through targeted climate adaptation action. Actions that

target and enhance adaptive capacity are practical and effective ways to reduce vulnerabilities, while also promoting the many factors that contribute to a healthy and sustainable community.

[Visual 1](#) defines each of the factors of vulnerability and focuses on how collectively we can enhance adaptive capacity through actions that address key determinants of health. This includes but is not limited to the actions that uphold Indigenous knowledge systems, strengthen and support social connections and networks and improve equitable access to resources.

Factors of Climate Vulnerability



Exposure – The likelihood someone will encounter a climate hazard



Sensitivity – The role that an individual's physiological characteristics play in determining their susceptibility to a climate hazard



Adaptive Capacity – The ability to adjust or reduce health risks based on socio-economic status, housing, employment and access to community services

[Visual 1](#) — Roll over to expand visual or click to view online

Community Resilience in Action

The Ktunaxa Nation community of ʔaq̓am



A member of the ʔaq̓am community of the Ktunaxa Nation lights a test fire ahead of a prescribed fire burn on the community's land.

Photograph by Jesse Winter, accessed from [The Globe and Mail](#) ↗

On a 30-degree day in mid-July 2023, two power lines went down in the Ktunaxa Nation community of ʔaq̓am near Cranbrook. A major wildfire began to burn, and continued for weeks.

ʔaq̓am has had fires in the past, but noticeably different this year was how quickly the fire grew and spread. The fires devastated some families who lost their homes and still have no way to return. Thanks to many agencies and firefighters from near and far, houses were saved even when everything around them burned. Community members are grateful that nobody was injured or killed, despite the severity of the wildfire.

Just a few months earlier, in April 2023, the Ktunaxa Nation worked in partnership with personnel from ʔaq̓am, the BC Wildfire Service, fire departments from the City of Cranbrook and the City of Kimberley, as well as other contractors, to conduct a major prescribed burn at ʔaq̓am. About 1,200 hectares (12 square kilometres) were part of this prescribed burn, sometimes known as cultural burning or traditional burning.

The partnerships developed during the prescribed burn facilitated a cohesive response to the wildfire that occurred summer 2023. Michelle Shortridge, ʔaq̓am's director of operations, reflected on the many benefits of the prescribed burn which had been more than five years in planning.

"It turned out to be a great opportunity to build connections, because the same people who helped with the burn came back to our community to help with the wildfire," says Shortridge. "Folks knew each other, and who did what. It made our response operations run much smoother than you would expect in an emergency."

Additionally, the City of Cranbrook fire chief noted that the prescribed burn helped to significantly ease concern with respect to the directions that the wildfire could grow and risk to homes in those areas and allowed crews to focus response efforts in areas where a prescribed burn had not yet been conducted.²

"Ktunaxa people were known to use burning as a tool, so taking back cultural practices to have healthy forests and ecosystems is important."

– Michelle Shortridge, ʔaq̓am Community

While the community continues to deal with the traumatic physical and emotional impacts of the wildfire, a research project has begun to study the effects of the high-intensity wildfire vs. the low-intensity prescribed burn and offers hopeful evidence of the value of prescribed and cultural burning practices in maintaining forest health and building community partnerships.

"ʔaq̓am has so much gratitude for partners like the Regional District of East Kootenay and BC Wildfire Service, and for our close relationships with our neighbours, the City of Cranbrook and the City of Kimberley. Those agencies truly care about our community. We feel that."

– Michelle Shortridge, ʔaq̓am Community

For another example of collaborative cultural burning practices refer to [Case Study 10: Indigenous Knowledge Systems with Western Science for Forest Management – Yunešit'in and Xeni Gwet'in First Nations](#) ↗

Climate Hazards and Actions

IN THIS SECTION:

Extreme Heat	16
Cold Weather	23
Flooding	28
Wildfires and Smoke	35
Drought	36



Climate hazards are climate-related physical events that impact natural and human systems. They cause loss of life, injury and other health impacts, as well as cause damage and loss to property, infrastructure, services, ecosystems, economy, services or cultural assets.*

In 2019, B.C. completed a Preliminary Strategic Climate Risk Assessment examining the likelihood and consequence of 15 climate hazards across the province. Results from the assessment indicated which climate hazards were most significant, and which areas of the province may be particularly susceptible to these hazards.¹⁰

Extreme heat, cold weather, flooding, drought, wildfires and smoke have been identified as climate hazards that are most likely to impact the Interior Health region.

The following section focuses on these hazards. Each section explores and answers the following questions:

- What is the hazard?
- Why is it affecting health and well-being?
- Who is being affected the most?
- How do we take action?

Real-time climate hazards can be seen in [EmergencyMapBC](#) ↗ which serves as a general reference for current public safety conditions during emergencies.

*Definition adapted from the [Intergovernmental Panel on Climate Change Sixth Assessment Report](#) ↗



Extreme Heat

What is the hazard?

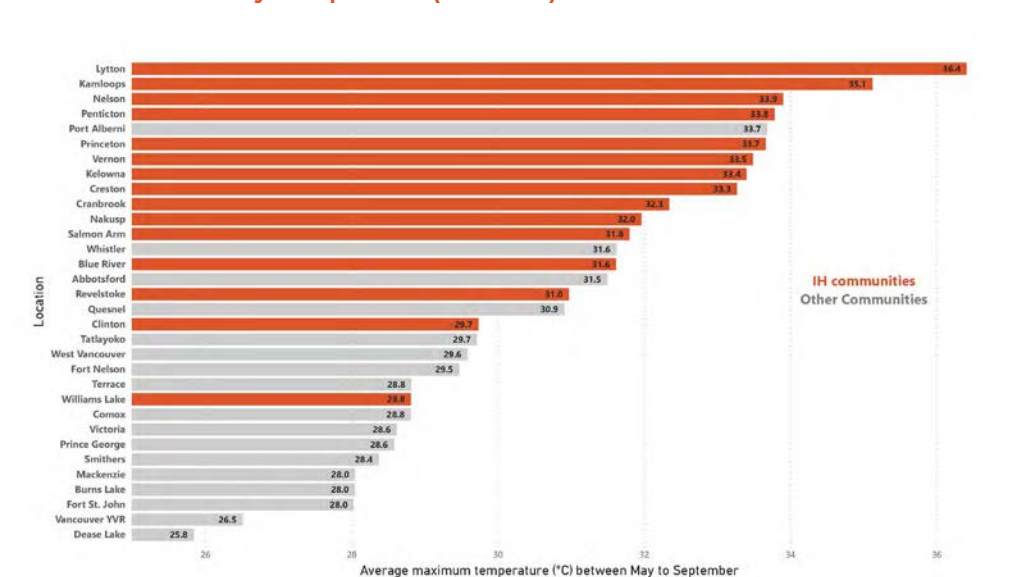
Extreme heat events, or heat waves, are extended periods of time (at least two days) with relatively high temperatures for a given location. A “heat dome,” such as the one that occurred in June 2021, is caused by a high-pressure system that traps hot air beneath it, creating a dome of heat over a region.

Extreme heat events usually occur between May and September and are expected to become more severe, frequent and longer in B.C. These events have the potential for significant consequences including illness and death. In fact, extreme heat is the leading cause of weather-related deaths in Canada.¹⁰⁻¹²

While the Interior Health region of B.C. has always been known for its hot summer weather, it is often the hot spot in Canada and B.C. (Figure 1). Climate models show that the Interior Health region is expected to become even warmer, with more frequent and severe extreme heat events. This increase in temperature over the upcoming decades is mapped in [Climate Atlas of Canada](#).

Extreme heat events can also act as a driver of other climate hazards such as drought, wildfire and flooding.

Figure 1: Communities in B.C. ranked from high to low for average maximum temperature recorded between May to September (2019-2023)



Between June 25 and July 1, 2021, much of B.C. experienced an unprecedented heat event that peaked on June 27 and 28. (Figure 2) This event included record-breaking daytime and nighttime temperatures and led to 526 heat-related deaths provincially, and 64 deaths in the Interior Health region. (Table 1)

Individuals aged 70-79 accounted for 36 per cent of these deaths. (BC Coroners Service, 2021) Most of these deaths (96 per cent) occurred in residential settings, highlighting the dangers of indoor temperatures during heat events. (BC Coroners Service, 2021)

The 2021 heat event also brought particularly devastating immediate and lasting consequences for the Village of Lytton and Lytton First Nation, much of which were destroyed by fire on June 30, 2021 following days of record-breaking heat.

Figure 2: Maximum temperature recorded in June (2010 to 2023) for B.C. and top eight hottest communities in B.C.

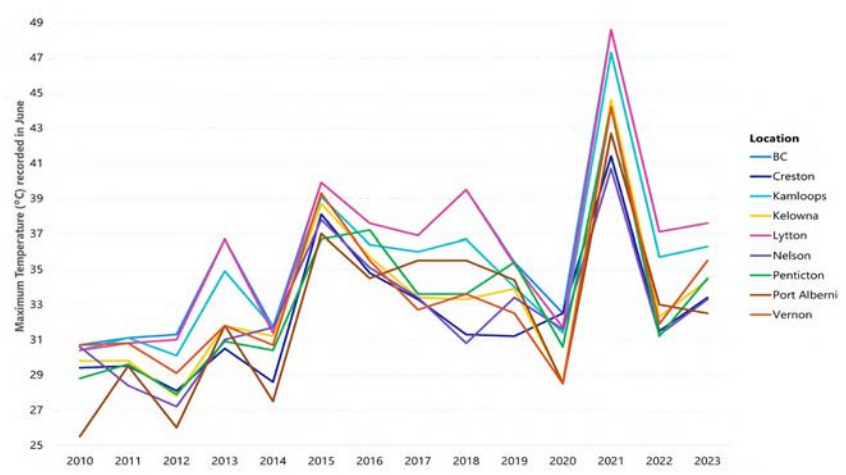


Table 1: Heat-related deaths by age group and location of injury at Interior Health, June 25 - July 1, 2021

Heat-related deaths and rates by health services delivery area (HSDA) of injury, June 25 - July, 2021 ¹³		
HSDA	# of Deaths	Crude Rate per 100,000
East Kootenay	4	4.6
Kootenay Boundary	3	3.6
Okanagan	32	7.8
Thompson Cariboo Shuswap	25	10.3
Total	64	

Heat-related deaths by injury location and health authority of injury, June 25 - July 1, 2021	
Inside Residence	57
Outside	3
Public Building	1
Unknown	3
Total	64

Inside Residence - Includes either decedent's own or another's residence, hotels/motels, rooming houses, SROs (single room occupancy), shelters, social/supportive housing, seniors' homes, long-term care facilities, nursing homes, etc.

Outside - Includes vehicles, streets, sidewalks, parking lots, public parks, wooded areas and campgrounds.

Public Buildings - Includes restaurants, community centres, post offices, businesses, etc.

Why is extreme heat impacting health and well-being?

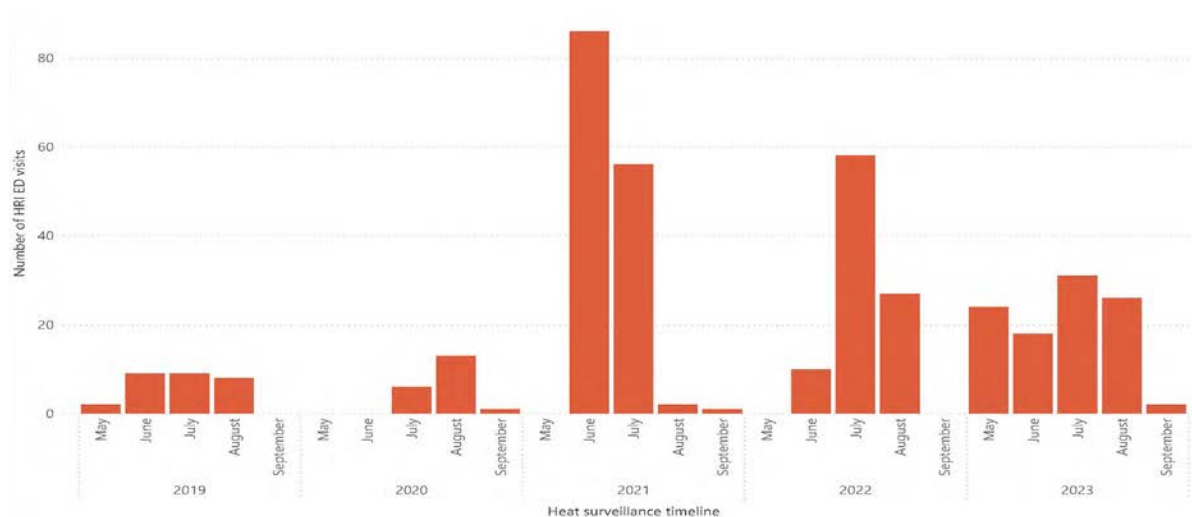
While we are typically able to adapt to gradual increase in temperatures over the summer months, extreme heat relative to average temperatures can lead to dire health outcomes and is associated with increased deaths.

Impacts on physical health from heat can result in a cascade of illnesses, including heat cramps, heat exhaustion and life-threatening heatstroke. During periods of extreme heat, people can also succumb to underlying health conditions (e.g., respiratory or cardiovascular conditions) that are heat sensitive. BC Centre for Disease Control developed [BC Heat Impacts Prediction System](#) which is intended for use by members of the public during hot weather. It indicates levels of health risks for the current day and following two days at a given geographical location.

Interior Health has been experiencing an increased number of heat-related illness (HRI) emergency department visits over recent years. The highest number of HRI visits in the Interior Health region occurred in June 2021 which corresponded with the heat event of that year. (Figure 3)

Direct physical health effects from heat events can also be experienced some time after the event has occurred, because heat stress on the body can accumulate and indoor temperatures can stay high. For example, the impact of heat on pre-existing health conditions may be gradual and take a few days to result in more severe illness or death.

Figure 3: Number of heat-related illness (HRI) emergency department (ED) visits at Interior Health between May and September in the last five years



Heat can also impact our mental health and well-being. Extended heat events can trigger or exacerbate mental, behavioural and cognitive disorders, ranging from exhaustion, anxiety or stress, and in some cases can lead to suicide. Social isolation and compromised mental health, particularly schizophrenia, were identified as specific factors contributing to the vulnerability of people who died in the 2021 heat dome in B.C.¹³

Heat events can affect a person's ability to take part in important cultural events that occur during the summer months, and practices like hunting and gathering of traditional food and medicines. This can impact health and well-being for First Nation people who understand that well-being is directly related to connections with the land.

Similarly, ongoing heat events may limit a person's ability to participate in outdoor recreation and physical activities, which can impact health and well-being. The Interior Health region is a popular summertime destination for many tourists. The increasing frequency, intensity and duration of extreme heat events may negatively affect tourism, and the livelihoods of local people can also be threatened by the increased stress on infrastructure and transportation systems, economic productivity and ecosystems due to heat.¹⁴

Health and well-being impacts of exposure to extreme heat

Individual Impacts

Heat-Related Illness

- Dehydration
- Heat cramps
- Heat stroke
- Heat exhaustion

Worsening Chronic Disease

- Cardiovascular disease (heart attacks)
- Respiratory disease (asthma attacks)
- Other chronic disease (e.g., renal)

Worsening Mental Health

- Increased incidents of suicide
- Increased admission to hospital for other mental health disorders

Indirect Physical Health

- Sleep loss
- Accidents
- Violence
- Injury and death

Community Impacts

Cultural

- Impact on traditional food and medicine sources
- Impact on land-based activities
- Higher risk of heat-related illness for those who spend time outdoors

Economic

- Reduced tourism
- Increased household/business energy consumption and costs
- Impacts to agricultural sector
- Reduced productivity of outdoor workers

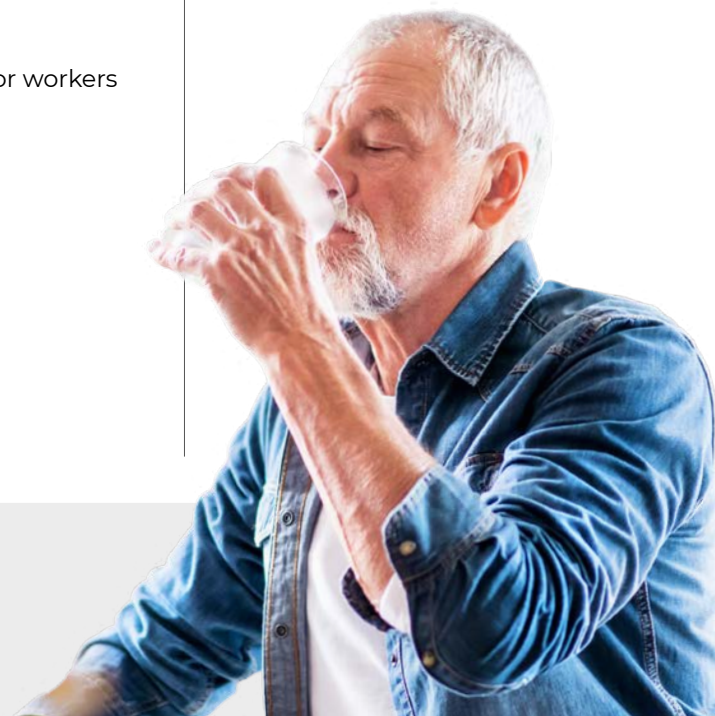
Health System Impacts

Increased Use of Health-care Services

- Emergency department visits
- Ambulance calls
- Telehealth calls
- Visits to primary care physicians

Stress on Health-care Facilities and Staff

- Burden on facility cooling systems
- Impacts to staff working in hot environments



Who is being impacted most?

High temperatures are more of a risk to: ^{5,11,15-22}



People with chronic poor health, heart problems or breathing difficulties



Older adults (over 65 years of age)

- These populations are often less able to adapt physically and can lack protective factors such as independence and social connections
- Older adults can also have more pre-existing chronic conditions (e.g., diabetes, high blood pressure and cardiovascular disease)



First Nation people due to historic and ongoing systemic racism and colonialism



People who are insecurely housed



People on certain medications



People who live alone or are socially isolated



People with a disability



People experiencing a substance use disorder



People who are pregnant



Infants and children

- These populations are less able to acclimatize to heat



People who are physically active outdoors or work outdoors



People with low incomes



People living in urban heat islands, or neighbourhoods with limited green space and tree canopy coverage.

- Individuals with lower socio-economic status often live in these neighbourhoods
- Urban heat islands occur because of surfaces with low albedo (e.g., dark roofs and asphalt), little vegetation, and other characteristics such as heat from motor vehicles, appliances, industry and air conditioners

How do we take action?

A provincial framework for responding to extreme heat events, called the [BC Heat Alert Response System](#) (BC HARS), was created in 2022. This framework is a two-tiered heat alert system that includes temperature thresholds, as well as recommended preparation and response actions for different sectors, including the provincial government, health system partners, local governments and First Nation communities, and community organizations.

The two tiers defined in BC HARS are “heat warning” and “extreme heat emergency.”

The Interior Health region includes two Environment and Climate Change Canada heat forecast regions. In the southern part of the IH region, a heat warning is triggered when temperatures are above 35°C for two consecutive days and overnight temperatures remain above 18°C. In the northern part of the IH region, a heat warning is triggered when temperatures are above 29°C for two consecutive days and overnight temperatures remain above 14°C.²³

Aligned with BC HARS, (IH) has developed an Extreme Heat Response Plan and a Seasonal Readiness Committee to ensure the safety, health and well-being of clients, staff and communities.

Interior Health has also developed a [Heat Response Planning Toolkit](#) to provide evidence-informed, practical information to assist communities with developing community-level heat response plans.

The toolkit incorporates evidence from the 2021 heat dome regarding factors that protected against injury and/or death including:

- Buildings with adequate cooling, such as air conditioning
- Connection to support and care, including caregivers, family and friends
- Protective effects of greenspace¹⁸

Some communities in the IH region have already developed heat response plans that build upon community strengths and assets. Other communities are enhancing existing emergency response plans by incorporating heat-related considerations and actions.

These plans include collaborative actions that are taken by local governments, community organizations, faith-based organizations and IH. Local actions to respond and adapt to heat include the promotion of:

- Public cooling locations
- Neighbour-to-neighbour check-ins
- Increased wellness checks for those at risk
- Actions individuals can take to create cooler spaces in their home

There are also actions that local governments can facilitate through policy interventions, planning and investment, such as protecting and enhancing access to greenspace. Funding to support various actions is available to local governments and First Nations through the [Union of BC Municipalities – Community Emergency Preparedness Fund](#).





Case Study 2

City of Penticton – CommuniTREE Plan

The City of Penticton is developing an Urban Forest Management Plan called the [Official CommuniTREE Plan](#). This plan will serve as a guide for the City's management of trees and forests and aims to benefit the community's health in many ways.

Trees and forested areas in urban settings offer many benefits to the community, including:

- Reducing the effect of heat islands
- Decreasing temperatures during heat events
- Filtering pollution from the air and water
- Preventing erosion and flooding
- Enhancing mental health

Trees and greenspaces also facilitate social interaction and physical activity, making this natural asset a vital component of the community's environmental, social and economic health.

Through the [Official CommuniTREE Plan](#) and public engagement, the City of Penticton aims to establish a community vision for Penticton's urban forest and work toward their goals over the next 20 years. The plan aims to implement strategic recommendations, policies and practices that will support trees so they can provide the greatest benefits to the community. The CommuniTREE Plan will also map Penticton's urban forest baseline to measure progress on implementation.

Case Study 1

City of Kamloops Extreme Heat Communication Plan

With support from the Interior Health Healthy Community Development team, the City of Kamloops Social and Community Development and Communications departments jointly created an Extreme Heat Communications Plan.

This plan maps organizational roles and standard messages to use before and during heat events, all through an equity lens. The plan is a notable example of how staff who aren't part of emergency operation centres can take a lead role in planning for heat events.

The City of Kamloops heat resources can be found on the city's [website](#).



Case Study 3

Țítqet Response to Local Climate Change Impacts

Țítqet, a community part of the St'át'imc Nation in B.C., has been severely affected by climate change and extreme weather events such as wildfires and heat events. These events have disrupted traditional livelihoods such as fishing, hunting and gardening. With funding support from Health Canada, a consultant worked with a Țítqet local Heat Team to develop a heat response plan that integrates existing emergency plans and builds on local knowledge.

The Țítqet Heat Team has raised awareness of heat preparedness through various means, including a video made by Chief Sidney Scotchman, social media posts and community meetings.

During heat events, staff regularly check in on Elders and the most vulnerable, delivering water and distributing air conditioners. Cooling spaces were also established in two community buildings through the installation of tinted windows and a heat pump.

When developing the heat response plan, both the consultant and the Țítqet Heat Team saw immense value in engaging with community members and Elders to align temperature and weather data with lived experiences and local knowledge.

Cold Weather



What is the hazard?

While winter weather is generally getting warmer due to climate change, we are increasingly experiencing extreme fluctuations in temperatures and more severe winter storms. As temperatures continue to rise, we become more adapted to warmer temperatures and become less prepared and acclimatized for colder temperatures.

Additionally, periods of cold weather are often associated with other weather events such as rain, wind, snow and ice, all of which have a compounding effect and have the potential to affect our health.

This means that when cold weather hits, communities feel the impacts even more.⁷ Environment and Climate Change Canada issues an extreme cold warning when temperatures or wind chill is expected to reach -35°C for at least two hours in the Interior Health region.²⁴

However, it is important to note that from a health perspective, prolonged exposure to temperatures at 0°C or colder can have detrimental health effects to those at risk.²⁵



Why is cold weather impacting health and well-being?

Cold temperatures can cause direct injury, such as frostbite and hypothermia, while also increasing the risk of respiratory, cardiovascular and stroke-related illness and mortality. The duration of exposure that leads to these health outcomes is not well understood.^{5,26} However, data from emergency departments show that most cases of hypothermia occurred at temperatures of 0°C or colder.²⁵

IH experienced an increased number of emergency department (ED) visits for cold-related illness (CRI) in fiscal year 2022 and 2023, compared to the previous four fiscal years. (Figure 4) Notably, December 2022 had the highest number of CRI ED visits (84) of any month in the previous five years. Frostbite or cold injury was the major presenting complaint in 2022.

Assessing the health effects of cold can be more difficult than heat as the health effects caused by cold can lag exposure (excluding hypothermia and frostbite), and the physiological response can persist up to 3-4 weeks after a cold weather event.^{27,28}

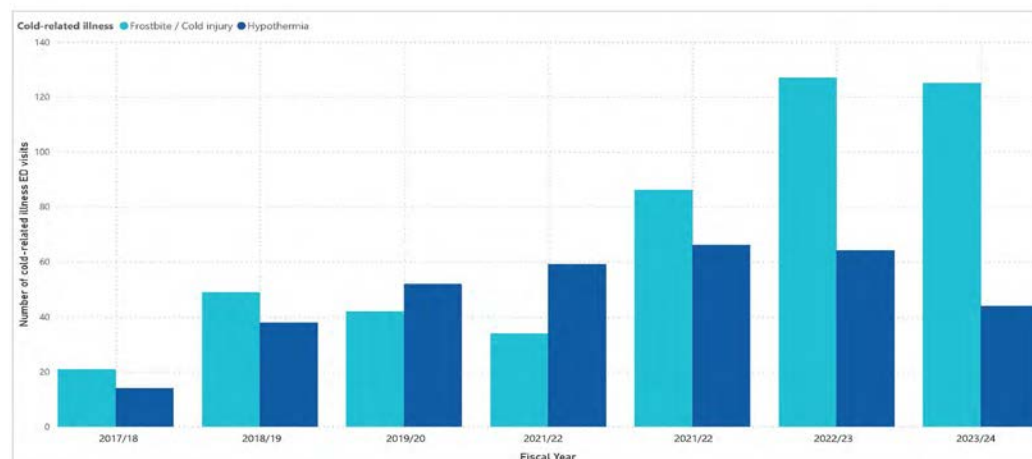
From an equity perspective, it is important to consider the relationship between low socio-economic status and winter injury and death, both for those who are housed and those who are precariously housed.

Low or middle-income individuals may turn down their heat to save money, leading to a decreased perception of well-being, and increased risk of respiratory issues for children.^{5,29}

People experiencing homelessness are significantly impacted by cold temperatures as they often experience prolonged exposures that can lead to injury and death, even in relatively mild conditions. Indigenous Peoples are over-represented among those experiencing homelessness compared to the broader population and can be disproportionately affected by low to moderate cold events.^{5,12,30}

People experiencing homelessness are more likely to experience significant effects due to underlying health conditions, challenges accessing services, and inability to take protective measures. The use of health services among people experience homelessness is higher than in the general population when the weather is cold.¹² The toxic drug and housing crises, together with the recent rapid increase in the overall number of people experiencing homelessness in B.C., create additional risks to health.³¹

Figure 4: Number of cold-related illness (CRI) emergency department (ED) visits by the type of illness at Interior Health in the last six years



Notes:

- ED visits related to cold-related illnesses were based on presenting complaint with a CEDIS code of "201 frostbite/cold injury" and "205 hypothermia".
- There is a possibility of underreporting hypothermia as the patient may not be hypothermic once they are in ED.
- Fiscal year (April - March) is used instead of calendar year to capture one winter season. For example, fiscal year 2023/24 covers April 2023 - March 2024.

In a chart review of ED visits for cold-related illness in December 2022, 42 per cent of individuals were either experiencing homelessness or lived in inadequate housing, such as a mobile or motor home with no access to heating. Other ED visits for cold-related illness were related to recreations (16 per cent) and occupational (13 percent) exposure to cold temperatures. Of those individuals experiencing homelessness, the majority had a concurrent substance use and/or mental health disorder.

Actions and interventions to respond and adapt to cold weather events need be implemented in ways that are appropriate, timely and culturally safe for those most impacted.

Health and well-being impacts of exposure to cold weather

Individual Impacts

Injuries from Ice and Snow

- Slips, falls
- Motor vehicle collisions

Injuries from Cold Exposure

- Hypothermia
- Frostbite

Injuries from Unsafe Heating Methods

- Burns
- Carbon monoxide poisoning

Death

Community Impacts

Economic

- Increased household/businesses energy consumption and costs
- Reduced productivity of outdoor workers
- Potential power outages
- Damage to crops and agriculture

Safety

- Specific impacts to underhoused populations due to lack of safe and appropriate indoor spaces
- Impacts to infrastructure such as burst pipes, flooding or structural fires due to heating system malfunctions

Health System Impacts

Increased Use of Health-care Services

- Emergency department visits
- Ambulance calls
- Telehealth calls
- Visits to primary care physicians
- Challenges for safe discharge planning for those without a fixed address

Stress on Health-care Facilities and Staff

- Burden on facility heating systems
- Impacts to staff working in cold environments



Who is being impacted most?

Cold temperatures are more of a risk to:^{5,6}



People experiencing homelessness



People who are physically active outdoors or work outdoors



People who use substances such as alcohol or illicit drugs



People living in inadequate housing without adequate insulation, or without adequate electricity or heat (also known as living in a state of energy or fuel poverty)



People with limited mobility



People with certain medical conditions such as diabetes and peripheral neuropathy (muscle weakness, tingling, numbness), and diseases affecting the blood vessels



People taking certain medications, including beta-blockers



Older adults (over 65 years of age), infants and young children

How do we take action?

Though there is not a provincial response system in place currently for cold weather in the same way there is for extreme heat, there is guidance for exposure to cold temperatures, specifically for those who are precariously housed or living outdoors.

With this population in mind, Interior Health has a Seasonal Readiness Committee to recommend actions that support clients who may be impacted by exposure to cold weather. This includes changes to hospital discharge processes, enhanced supports for mental health and substance use, harm reduction and street outreach programs, as well as safeguarding IH infrastructure from the impacts of cold.

Like extreme heat planning and response, communities in the IH region can plan and prepare for cold weather events to ensure those who are most at risk are protected.





Case Study 4

Salmon Arm Collaborative Cold Weather Response

At the beginning of winter 2022, a homeless encampment emerged in Salmon Arm with a population of around 19,000. This situation followed the closure of the community's shelter in spring 2022. The City, BC Housing (BCH), and the Canadian Mental Health Association (CMHA), a local housing provider, had been unable to find a location for a new shelter in the community, and there was an urgent need to keep unhoused people safe during cold weather.

CMHA took the lead and partnered with the City to create a temporary winter shelter with financial support from BCH. Knowing the initiative was temporary, City staff and council proposed the use of City property for a permanent shelter.

Through collaborative efforts, BCH, CMHA, Interior Health and City staff have moved through a community engagement process and [opened a year-round shelter](#) in December 2023.

BCH is handling funding and construction, CMHA will be the operator, and BCH will lease the property from the City for 10 years, with the possibility to extend the lease. This example shows how collaboration across sectors can result in action that improves long-term climate resilience for those most vulnerable.

Case Study 5

Public Health Recommendations to Reduce the Impacts of Exposure to Winter Weather on People Experiencing Homelessness in British Columbia

Preventing cold-related injuries and deaths is possible, but it requires coordinated and timely interventions to reduce exposure and risk. Recognizing that exposure to cold and winter weather has disproportionate health impacts on people experiencing homelessness, the BC Health Effects of Anomalous Temperatures Coordinating Committee (BC HEAT Committee) developed [specific public health guidance](#) for organizations to support people experiencing homelessness.

This guidance includes key messages to help prevent winter weather impacts and considerations for developing activation criteria for winter weather plans and/or when responding to winter weather events.



Flooding

What is the hazard?

Early snowmelt, increased average and extreme precipitation, reduced ice cover, warmer winters and springs, and higher sea levels influence the frequency and intensity of flooding and erosion.^{12,32,33}

Warmer spring and winter temperatures, in addition to more rain precipitation instead of snow, will lead to earlier snowmelt and earlier and higher volume spring flooding. In urban environments, increases in extreme precipitation will lead to more frequent flash flooding, putting people and community members at risk.^{32,33} In B.C., the most severe floods typically occur during spring and early summer due to melting snow and increased rainfall. This type of seasonal flooding is known as freshet.³⁴

Studies conducted in B.C. on the effects of climate change on landslides have shown that heightened precipitation and warming temperatures have increased the frequency and magnitude of landslides over the past century.^{35,36}

There are also higher risks of flooding and landslides after wildfires when trees and their root structures are destroyed. The risk for flooding increases if the rainfall follows a prolonged dry period, as water is unable to soak into dry, fire-altered soils. Instead, the water is repelled and flows over the land, instead of soaking into it. The soil is no longer held by tree roots, and runoff causes erosion, filling creeks with sediment and increasing flood risk. The increased risk of floods or debris flows in severely burned areas may persist longer than two years.³⁷

In recent years, many communities in the IH region have experienced the devastating effects of flooding. The flooding events that occurred in 2017 and 2018 had much higher impacts on the number of evacuations and total estimated costs. In addition, during the 2021 floods, more than 17,000 people were evacuated from their homes. (Table 2)

The 2017 wildfire season was preceded by record high runoff and damaging floods at Okanagan Lake, impacting water systems and supplies.

Similar conditions in 2018 caused significant damage in Grand Forks. An atmospheric river event in November 2021 brought record precipitation to many areas of Southern B.C., leading to destructive flooding in several communities.³⁸ The extreme precipitation led to several landslides, resulting in deaths and the failure of several highways that isolated communities and disrupted the flow of goods and services.³⁸ During this time, IH evacuated and relocated 277 patients and residents who were all safely repatriated by the beginning of January 2022.³⁹

Estimates suggest that this atmospheric river event led to at least \$450 million in damages in the province.⁴⁰ In addition, the event triggered floods that severely damaged infrastructure in Merritt and Princeton, resulting in drinking water advisories that remain in place today.

For more information about the 2021 flood event, see this [Storymap](#).

Table 2: Overview of impacts of significant flooding events in the Interior Health region since 2017

April-June 2017	May 2018	November 2021
<p>Location of flooding Widespread flooding of Okanagan and Nicola lakes</p> <p>Number of people evacuated 2,500</p> <p>Number of communities affected 73 communities including 15 First Nations communities</p> <p>Number of people injured including fatalities 2</p>	<p>Location of flooding Extensive flooding in B.C.'s Kootenay Boundary and Okanagan-Similkameen regions</p> <p>Number of people evacuated 4,000</p> <p>Number of communities affected 6 regional districts and 8 First Nations communities</p> <p>Number of people injured including fatalities 2</p> <p>Other damage 400 homes and 100 businesses destroyed</p>	<p>Location of flooding Atmospheric rivers cause destructive flooding in many communities (Abbotsford, Merritt and Princeton), and landslides</p> <p>Number of people evacuated 7,000+ city wide evacuation in Merritt</p> <p>320 Interior Health staff were placed on evacuation alert and about 300 people were evacuated from IH sites</p> <p>Other damage Failure of multiple bridges across the province, triggering a province-wide state of emergency</p> <p>Access to Nicomen Indian Band was cut off after the only bridge connecting their community to the highway collapsed into the river</p> <p>The sudden rise of the Coldwater River caused extensive flooding in Merritt, impacting their water treatment plant and temporarily closing the local hospital</p> <p>Highway 8 damage cut off access for many First Nations communities, including Shackan, Cook's Ferry, and Nooaitch First Nations</p>

The impacts of flooding can greatly influence the connection First Nation people have to their environment, as illustrated in this statement by a Nlaka’pamux Elder:

“Animals like fish and deer are impacted by climate change because of its impact on the land. [We] used to be able to predict and count on seasons to provide certain types of food but now we don’t know what’s coming with each season.

We used to see deer and other wildlife cross the Nicola River from one side to the next but after the floods, quarry rock pulled down from the mountain and concrete barriers on the highway make it hard for wildlife and people to access the river.

Before the floods, there used to be red willow (for medicine), silver willow (seeds for beading), Saskatoon (scaq^wm), chokecherry bushes (food sources for people and wildlife), and fir and ponderosa pine. The flood ripped many of these pine trees that provided shade during the summer and a canopy from the rain and snow and perches for eagles.

Where we used to forage, now we see blighted plants where soapberries (sx^wúsm) and Saskatoon (scaq^wm) berries used to grow.”

– Nlaka’pamux Elder

Why is flooding impacting health and well-being?

Floods can affect all areas of our lives. Health impacts include drowning, injury, hypothermia, wound infection and electrocution.^{41, 42}

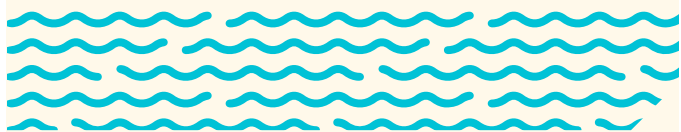
Floods can cause power outages, impair living situations, increase financial burdens and uncertainty, and impact our social lives.⁴³⁻⁴⁵ Several studies have linked flooding to disruption to livelihood and increased prevalence of post-traumatic stress, decreased feelings of safety, and even increased use of drugs, alcohol or medication.^{5, 10, 43, 46, 47}

Floods have the potential to contaminate food and water and can damage both animal and aquatic habitats.^{5, 34} For example, the force and amount of flood water can disrupt salmon migration pathways, injuring the fish and washing away their eggs.

Furthermore, floods can wash toxic chemicals into streams and groundwater, resulting in pollution travelling up the food chain. Consequently, species such as bears, orcas and wolves can all be affected.^{5, 34}



Additionally, during a flood human health can be impacted by water-borne illnesses from contaminated water sources used for drinking water, bathing, recreation or ceremonial uses.⁴



Health and well-being impacts of exposure to flooding

Individual Impacts

Injuries

- Falling trees
- Potential electrical hazards
- Unsafe structures
- Unsafe debris

Worsening Mental Health

- Post-traumatic stress
- Anxiety
- Depression

Worsening Chronic Disease

- Respiratory disease (increased rates of asthma attacks and allergies related to mold growth)

Socio-economic & Cultural

- Displacement from home and social supports
- Impacts to livelihood, loss of income, cost of repairs to/replacement of property
- Disconnection from community/cultural practices

Community Impacts

Decreased Water Quality

- Increased turbidity and debris in source water, reducing effectiveness of treatment systems
- Increased treatment expenses (filtration)
- Increased potential of contamination to source water (metals, hydrocarbons, sewage)
- Increased waterborne illness due to contamination

Food Quality

- Increased foodborne illness from microorganisms introduced into food and the water used to grow the food
- Food exposed to chemical hazards (poisonous toxic substances) and physical hazards (foreign objects or unwanted materials)

Socio-economic and Cultural

- Cut-off transportation routes
- High cost for response and recovery activities
- Immediate and long-term displacement or lack of housing
- Decreased tourism
- Negative impacts on local business and economy

Health System Impacts

Increased Use of Health-care Services

- Emergency department visits
- Ambulance calls

Stress on Health-care Facilities and Staff

- Damage to sites and service disruption
- Disruption for staff living in flooded communities, or who are evacuated or working extended hours



Who is being impacted most?

Flooding and landslides are more of a risk to: ^{5,42,48-51}



Older adults (over 65 years of age), children and adolescents

- May experience greater symptoms of anxiety, depression and post-traumatic stress



People with pre-existing health conditions



First Nation communities

- First Nations people are overrepresented due to historic and ongoing systemic racism and colonial policies
- As well as having a deep connection to the land, First Nation communities can be isolated (due to colonial impacts and/or geography) or can become isolated due to flood-related damage to roads. Additionally, because of colonial systems, these communities often face socio-economic challenges and aging infrastructure that can make flood recovery more difficult



People lacking insurance, who often face the greatest psychosocial impacts of flooding



People living rurally or people with low socio-economic status (as they are often not equipped to adapt to flooding hazards)



People living near steep slopes (as they are at greater risk of experiencing a landslide)

How do we take action?

Interior Health works with regulated facilities such as drinking water operators and systems to:

- Develop emergency response plans
- Conduct continual water quality monitoring
- Issue water advisories
- Attend food premises for post-flood clean-up and food safety inspection and monitoring

During the 2021 atmospheric river event, IH supported affected communities by:

- Attending public meetings
- Working with partner agencies to support private drinking water users
- Providing health risk information and resources to local governments and the public



Read how Grand Forks is building resilience to flooding



Case Study 6

Boundary and Grand Forks Flood Response and Recovery

On May 10, 2018, after a week of high temperatures and three days of rainfall, Grand Forks and the Boundary Region experienced the worst flood in the community's history. The flood was partially caused by a large amount of snow melt, with the late spring snowpack at 240 per cent of the regular annual average. The City of Grand Forks' lowest-income neighbourhoods were the most heavily impacted. These neighbourhoods include a larger proportion of rental housing than other parts of Grand Forks, as well as many older houses in need of maintenance and repair. The unhoused population who often camp by the river lost access to their home. There was an increase in unhoused and precariously housed, or those "couch surfing" following the floods.⁵² This flood highlighted the crucial need for up-to-date floodplain mapping data and an updated flood management strategy.

A five-pillar recovery management model was developed that included critical infrastructure, wellness, economy, environment and housing. The implementation of the recovery plan, led by the Boundary Recovery Team, was made up of cross-sectoral partners including the City of Grand Forks, Regional District of Kootenay Boundary, Community Futures Boundary, Boundary Family Services, Urban Matters and the Kettle River Watershed Authority.

One of the key successes under the wellness pillar of the model was case management, which refers to the coordination of care and services based on a person's needs. This case management approach was used intensively for the more than two dozen families that remained homeless for many months after their houses were lost to the flood. Case managers advocated for flood-affected residents, and connected them with health, social and financial services.



Case Study 7

Drinking Water Resiliency in the City of Merritt

On November 13, 2021, the City of Merritt experienced an atmospheric river event over the course of two days, resulting in 300 mm of precipitation and widespread flooding. A local state of emergency was declared in large part due to the inability of the wastewater treatment plant to receive wastewater. The entire community of more than 7,000 people was evacuated on November 15 to neighbouring municipalities.

The initial survey of flood damage identified significant mud and debris throughout the city, with mud up to five feet deep in some areas. There was significant road damage, sink holes, and damage to the sewage system and the drinking water distribution network. Even so, based on a review conducted by IH, it was evident that the drinking water system protections that the City of Merritt had put in place prior to the flood contributed to a resilient drinking water system that could withstand the damage of the flood.

These protections included having a drinking water well outside of the floodplain and robust source water assessment. The system also had an emergency plan and staff were prepared to respond to such events.

As a result, the City was able to ensure safe drinking water for the community and remove all drinking water advisories by December 2021. This example highlights how local governments can manage community infrastructure and assets in a way that improves resiliency to climate events and protects the health of community members.



▶ Watch this video about Yaqan Nu?kiy Wetlands restoration



Case Study 8 Yaqan Nu?kiy Wetlands Restoration

During the 20th century, many landscape modifications were made in the Creston Valley, located in unceded Ktunaxa ?amak?is territory, to compartmentalize and separate wetlands and agricultural fields.

The wetlands near the confluence of the Kootenay and Goat Rivers are thousands of years old. Healthy wetlands provide an abundance of benefits to communities and the environment, including water filtration, the recharging of ground water, reduced flooding, water storage during spring freshet, and significant carbon capture. Hydrated soils can also retain green vegetation and mitigate the risk of wildfire.

In 2017, the Ktunaxa people who reside at Yaqan Nu?kiy, the Lower Kootenay Band, began planning a comprehensive wetlands restoration project and have had great success in correcting changes made more than 50 years ago.

By bringing them back to their natural state, these wetlands can once again provide habitat for dozens of species, including waterfowl, elk, moose, grizzly bear, mule deer and amphibians.

Contrary to settler-colonial ways of thinking, the seasonal ebb and flow of water levels through this wetland offer precisely the kind of stability that is needed in a changing climate.



Case Study 9 City of Fernie Flood Adaptation with Co-benefits

The City of Fernie has been actively addressing flood risk since developing its 2019 Flood Mitigation Plan. This plan uses data from the 2014 Coal Creek study and the 2017 Elk River study to create modern floodplain mapping and builds on almost two decades of planning work.

Staff and elected officials pursued funding opportunities and have secured over \$8 million in government grants. These grants have allowed implementation of the Flood Mitigation Plan and resulted in enhanced flood protection in many Fernie neighbourhoods.

The flood mitigation project combined flood protection improvements to an existing dike (the Annex Dike) with active transportation upgrades along the dike trail, and created new amenities: an all-ages play area, drinking fountains, learning space, paved accessible path, boat launch to the river, covered picnic shelter, among others.

The Annex trail system was linked to other active transportation pathways, providing a safe connection between commercial, residential and recreation areas in the community. The Annex Dike protects more than 900 residences, 113 commercial properties, six industrial properties and more than 2,000 citizens living in the Annex neighbourhood. The dike also contributes significantly to active transportation infrastructure and access to outdoor public spaces, all of which contribute to health and well-being of the community at large.

Wildfires and Smoke



What is the hazard?

Climate change has been a key factor in increasing the risk and extent of wildfires throughout B.C. Rising temperatures that continue to dry out vegetation more quickly and thoroughly, combined with the presence of dry fuel, cause more fires to start, and burn farther and wider.⁵

Increasing temperatures can also promote the development of windy conditions and more lightning storms, which contribute to the ignition and spread of wildfires. Warmer weather is causing earlier snowmelt and later fall frosts, lengthening the wildfire season.⁵³

In recent years, the IH region has experienced prolonged heat events followed by significant wildfire events. In late June 2021, B.C. experienced a heat dome where record-breaking temperatures were reached in many areas across the province. On June 30, 2021, days after recording the highest temperature ever in Canada at 49.6°C, the Village of Lytton was destroyed by a devastating wildfire.³⁹ In 2023, the wildfire season proved to be the most destructive on record. (Figure 5)

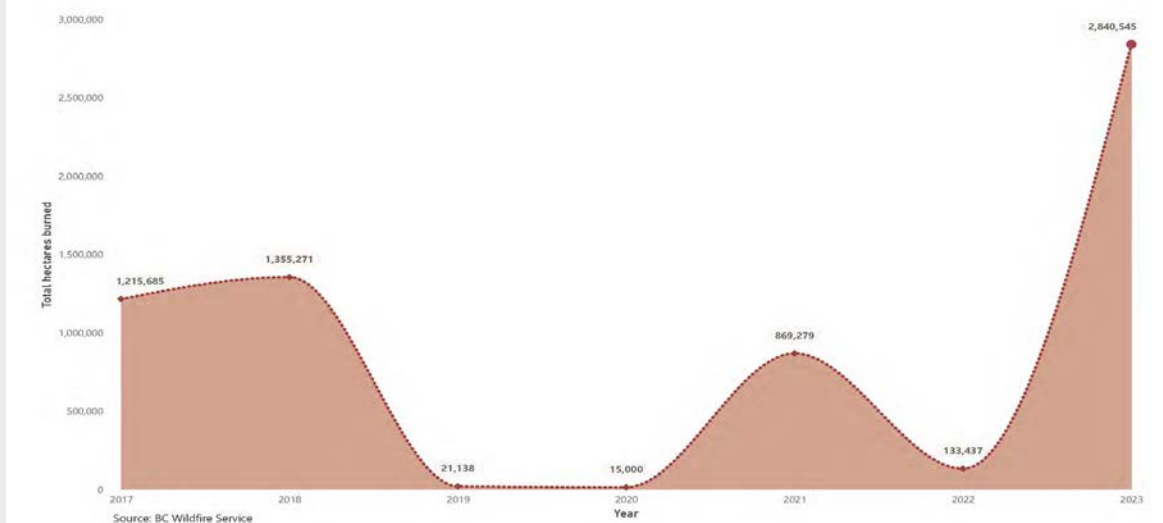
Dry conditions and wildfire risk can develop over a relatively short period of time, even after periods of flooding. This was evident in both 2017 and 2018 when communities in the Interior Health region

experienced major flooding events, followed immediately by significant wildfire seasons.

In 2017, 2018, 2020, 2021 and 2023, smoke from fires in B.C., the Northwest Territories, as well as the United States, contributed to poor air quality in communities across the province.

In 2021, 10 of the 118 air quality monitoring sites in the province exceeded the [provincial annual air quality objective](#) for [fine particulate matter \(PM_{2.5}\)](#). Seven of these sites were in the IH region, namely Castlegar, Vernon, Golden, Kamloops, Grand Forks, Kelowna and Cranbrook.⁵⁴

Figure 5: Total hectares of land burned in B.C. due to wildfires since 2017



Drought

Given the relationship between dry conditions and wildfire risk as well as the broader impacts of drought, it is important to briefly touch on drought as a climate hazard.

Drought is characterized as an extended period of severe dryness resulting from a combination of reduced precipitation, elevated temperatures and heightened atmospheric evaporation.⁵⁵ It is a slow-onset disaster characterized by the lack of precipitation, resulting in a water shortage.

Drought can have a serious impact on health, agriculture, economies, energy and the environment.⁵⁵ Key areas of concern related to drought include drinking water availability and quality, food security and mental health.

Drought-related health risks range from dehydration and malnutrition to an increased likelihood of water, food, and vector-borne illness, cardiovascular and respiratory illnesses, and even death. Populations particularly at risk of health impacts include children and older adults, those with chronic illnesses, and individuals with low socio-economic status or living in rural areas and First Nation communities.⁵⁵ The farming workforce, remote populations and First Nation communities stand out as particularly vulnerable to mental health consequences due in part to identity loss, culture change and economic impacts.⁵⁶

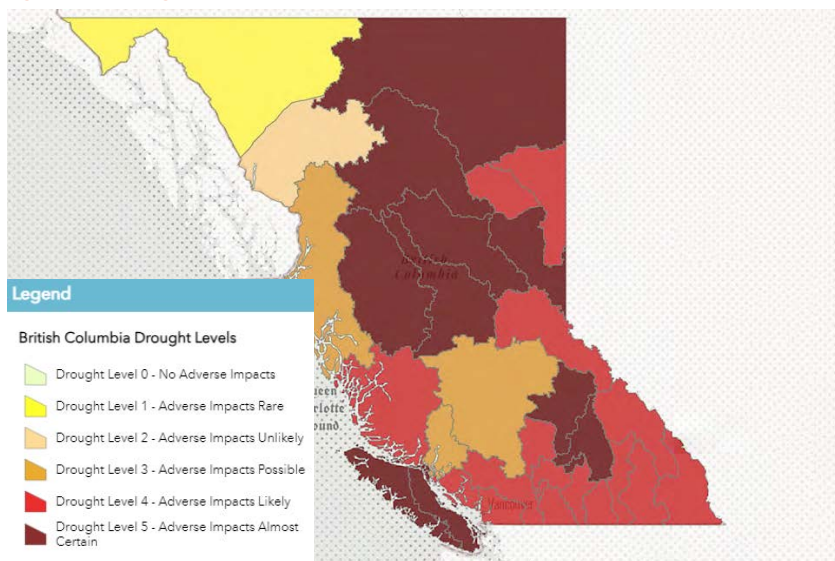
The summer of 2023 brought a historic drought in the Interior of B.C., reaching level 5 drought in the majority of regional water basins.

This was driven by extreme heat in May, resulting in the fastest freshet of provincial snowpack on record, coupled with below average precipitation throughout the year and ongoing dry and warm summer weather.

The severity of this recent drought season has adverse impacts on both ecosystems and communities, evidenced by water restrictions and advisories, increased cost and decreased production in agriculture and livestock farming, and an unprecedented wildfire season.

Although drought is not a new challenge to the B.C. Interior, the extent and severity of recent drought require proactive planning to predict and slow future impacts.⁵⁷

Figure 6: Drought levels for Interior basins for 2023



This video from our colleagues at Island Health provides a concise summary of drought and its impacts, along with corresponding actions that can be taken.

Why are wildfires and smoke impacting health and well-being?

The health effects from wildfires are vast, with air pollution being of primary concern. Smoke can travel over long distances and affect people far from the site of the fire.^{56, 58, 59}

Wildfire smoke consists primarily of a mix of particulate matter (PM), ozone, ammonia, carbon monoxide, nitrogen dioxide, polycyclic aromatic hydrocarbons, volatile organic compounds, water vapour and trace metals. There is no safe level of exposure for some of the pollutants associated with wildfire smoke. As smoke levels increase, the health impacts also increase.⁶⁰

Air pollutants from fires can lead to inflammation and suppressed immune responses and exacerbate existing respiratory conditions.⁶¹⁻⁶⁴

Since 2017, the highest air quality index was observed in 2023 with 597 µg/m³ (micrograms per cubic metre). (Figure 6) This represents almost a three-fold increase from 2022. Anything over 100 is considered unhealthy with 250+ being dangerous.

Individuals with pre-existing conditions, such as asthma, lung infections or respiratory diseases, seniors and children, are more vulnerable to the harmful impacts of smoke.⁶³⁻⁶⁶ To support health protection during wildfire smokes for the public, [BC Asthma Prediction System](#) [↗] was created which compares daily PM_{2.5} with inhaler dispensations.

[FireSmoke Canada](#) [↗] provides interactive forecasts of hourly, daily average and daily maximum concentrations of PM_{2.5} smoke particles at ground level from wildfires.

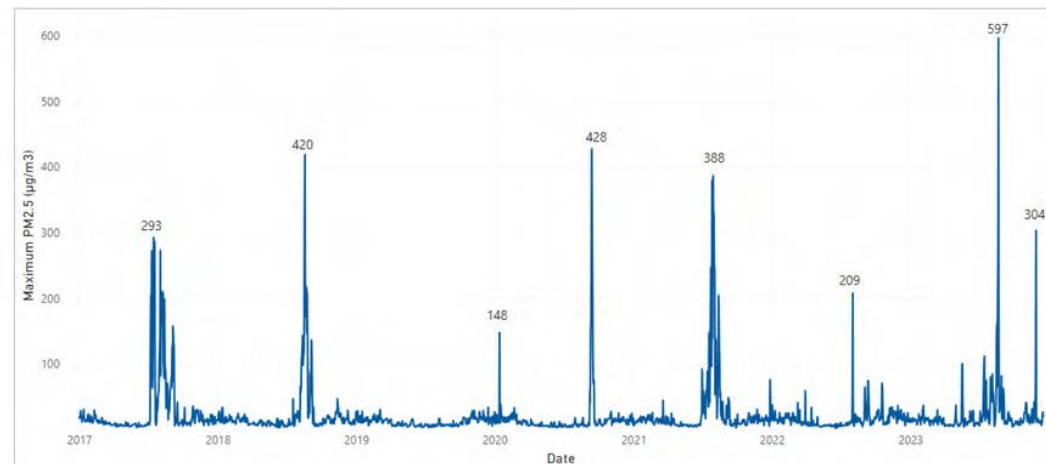
While the relationship between air quality and emergency department (ED) visits for respiratory and cardiovascular conditions in IH are unclear, studies have found that hospitalization rates for these conditions increase in people over the age of 65 during smoke events. People experiencing homelessness face barriers to accessing safe and appropriate places for relief from poor air quality, with the housing and toxic drug crises putting pressure on available shelter and supportive housing space.

Evacuations from wildfires can have immediate and lasting impacts on mental health and well-being, stemming from property loss, temporary displacement, financial stress due to loss of employment and income, and relocations. Children have been found to experience post-traumatic stress and have lower self-esteem and quality of life scores after wildfire events.^{58, 66, 67}

First Nation communities are disproportionately affected by wildfires, exacerbated by longstanding systemic and structural inequities due to colonialism and loss of connection to the land, traditional practices, and access to plants and medicines. A case study from the National Collaborating Centres for Public Health, [Out of the Ashes](#) [↗], explores the effects the long-term evacuation has had on the Ashcroft Indian Band due to the Elephant Hills wildfire in 2017.

Wildfires weaken ecosystems, leading to erosion and flooding events, and damage to drinking water infrastructure, all of which can affect the quality of drinking water.^{5, 68, 69} During the 2023 wildfire season in the Interior Health region, 88 permitted drinking water supply systems were in areas subject to evacuation orders. In 2021, 190 permitted water supply systems were similarly impacted, including the Village of Lytton.

Figure 6: Daily maximum PM_{2.5} concentrations 2017-2023 in the Interior region



Note: Majority of the peaks illustrated in the above figure occurred during the summer months.

Health and Well-being Impacts of Exposure to Wildfire and Smoke

Individual Impacts

Worsening Chronic Disease

- Cardiovascular disease (heart attacks)
- Respiratory disease (related to air quality)

Worsening Mental Health

- Post-traumatic Stress
- Anxiety
- Depression

Socio-economic & Cultural

- Displacement from home and social supports
- Impacts to livelihood, loss of income
- Disconnection from community/ cultural practices

Community Impacts

Natural Environments

- Destruction of natural habitats, agricultural land and traditional food sources, etc.

Socio-economic & Cultural

- Cut-off transportation routes
- High cost for response and recovery activities
- Immediate and long-term displacement or lack of housing
- Decreased tourism
- Negative impacts on local business and economy

Health System Impacts

Increased Use of Health-care Services

- Emergency department visits
- Ambulance calls

Stress on Health-care Facilities and Staff

- Impacts to sites (evacuation and service disruptions)
- Disruptions for staff who are evacuated or working extended hours



Who is being impacted most?

Wildfires are more of a risk to:^{5,53,60}



Older adults (over 65 years of age), infants and young children



People with respiratory conditions



People with chronic illness and underlying conditions



People with higher exposure to wildfire smoke



Those living or working near wildfire activity, including evacuees, emergency responders, frontline workers and outdoor workers



People who are unhoused



Those with lower socio-economic status or facing other inequities



First Nation communities

- Due to historic and ongoing systemic racism and colonialism, First Nations are overrepresented in the above factors and therefore are at more risk of the impacts of wildfires. Wildfires greatly impact traditional First Nations culture and their right to practices traditions and ceremonies on the land and waters which sustains their way of life.

How do we take action?

Given recent record-breaking wildfire seasons, Interior Health has developed expertise in wildfire response. Through the activation of Emergency Operation Centres, IH can safely and effectively evacuate care sites that are threatened by wildfire, redeploy staff to ensure adequate staffing levels, and monitor wildfire impacts on key public health infrastructure, such as drinking water systems. During wildfire events, IH also plays a role in communicating information to the public. [Read our reflections on the 2023 wildfires.](#)

Communities across the region are taking action to understand the dangers of wildfires, how they can help prevent fires from starting and spreading, and what they can do to reduce the risk to their communities and homes.

One of the primary ways that communities reduce wildfire risk in B.C. is through the [FireSmart Program](#). FireSmart focuses on mitigating wildfire risk through the implementation of individual and community-wide actions.

Local governments and First Nation communities can access funding and resources to support FireSmart programs in their communities.

In addition to FireSmart, there are other ways that communities are building resilience to the impacts of wildfire and monitoring air quality.



▶ Watch Revitalizing Traditional Fire Management in Tsilhqot'in Territory



Case Study 10

Indigenous Knowledge Systems with Western Science for Forest Management – Yunešit'in and Xenigwet'in First Nations

Yunešit'in and Xenigwet'in First Nations are working together with First Nations Emergency Services Society, BC Ministry of Forests, Lands and Natural Resource Operations, and Rural Development, and the BC Wildfire Service to revitalize traditional fire management on Tsilhqot'in title lands.

Traditional practices of cultural burning in early spring have a protective effect on the forest by reducing the fuel load—brush, grass, dry twigs and leaves—on the forest floor. This prevents wildfires from spreading as quickly when the season becomes hotter and drier, mitigating their worst effects. Indigenous-led programs like this, which give communities autonomy over forest management programs and land stewardship, are important to community resiliency.



Case Study 11

Returning Primary Care to Lytton

▶ Watch this video on the opening of the temporary health clinic in Lytton

Lytton is located in southern B.C., at the confluence of the Fraser and Thompson Rivers. Although the Village of Lytton is home to a relatively small community of 210 residents, it acts as a service hub for almost 1,500 residents of the surrounding area, including six neighbouring First Nation communities within the Nlaka'pamux Nation: Nicomen, Siska, Skuppah, Lytton, Kanaka and Cook's Ferry.

In late June 2021, IH experienced a heat dome where record-breaking temperatures were reached in many areas across the province. On June 30, 2021, days after recording the highest temperature ever in Canada at 49.6°C, the Village of Lytton was destroyed by a devastating wildfire. This included the destruction of St. Bartholomew's Health Centre which provided many primary care, allied health and diagnostic services to Lytton and the surrounding areas.

To date, the progress on the extensive recovery effort to rebuild Lytton has been slower than anticipated.

However, the efforts to rebuild health services in Lytton are well underway due to the collaboration and partnership between IH, First Nations Health Authority (FNHA), Nlaka'pamux Nation Tribal Council, local First Nation communities and the Village of Lytton.

- December 2021 – Health services re-established in Lytton, co-locating the Lytton First Nation Tl'kentsin Health Centre in collaboration with Lytton First Nation and FNHA
- September 2023 – Opening of a modular primary care clinic with access to physician and nursing services, mental health and substance use services, and home health and public health services
- Next phase – Planning for a permanent health facility to replace St. Bartholomew's Health Centre

Co-benefits of Climate Action on Health and Well-being

IN THIS SECTION:

[Strengthening Community Resilience to Climate Change 42](#)

As explored through this report, the impacts of climate change are wide-reaching and will continue to negatively affect our health and well-being, as well as our ecological, social and economic environments.

However, when efforts to reduce climate risks and adapt to climate change are coordinated across sectors, there are many social, economic and cultural benefits that support individual and community health while benefitting our environment and climate. The cascading benefits of climate action are also known as the co-benefits of climate action.

Co-benefits have been defined as “the positive effects that a policy or measure aimed at one objective might have on other objectives, thereby increasing the total benefits for society or the environment.”⁷⁰

As illustrated in [Visual 2](#), climate actions that have co-benefits for the environment, community and individual health can strengthen the overall resilience of a community to adapt and respond to climate change. These include actions such as:



Supporting active transportation



Supporting local food systems



Incentivizing more affordable and efficient homes



Incentivizing lower emission vehicles



Prioritizing natural and resilient infrastructure management

Visual 2 — Roll over to expand visual or click to view online

Strengthening Community Resilience to Climate Change

To be effective, efforts to address and mitigate climate change impacts need to be a shared responsibility across all levels of governments and communities, and include both public and private organizations. At the community level, inviting people with lived experiences and expertise in climate change impacts to inform action is highly valuable. These approaches ensure climate actions are responsive to local climate risks and promote and protect health and well-being across the community.^{71, 72}

The following section outlines shared roles, responsibilities and examples of action taken across sectors to create more resilient communities.

Health Authorities

Health authorities have a responsibility to minimize the environmental impact of health-care operations while supporting the staff, patients and communities they serve to mitigate and adapt to climate change impacts. As a health authority, Interior Health is actively working to reduce detrimental impacts.

Interior Health is committed to working toward a health system with zero emissions. Principles such as reducing the demand for health services, matching the supply of health services to demand, and reducing the emissions created by all health services, are being considered.⁷³

Health authorities are also well positioned to work with community partners to advocate for, convene and act on inter-sectoral public health issues such as climate action.⁷¹ This work includes supporting community planning and response to climate hazards, as well as supporting longer-range climate adaptation and mitigation actions such as community climate action plans, examples of which are detailed in the case studies throughout this report.

Recognizing these, IH has developed a [Climate Change and Sustainability Roadmap](#) ⁷⁴ that serves as a cohesive, overarching strategy to guide population-based climate action, and internal corporate sustainability across the organization.

First Nation communities

First Nation communities across the Interior Health region are using their intergenerational and land-based knowledge to respond to changes in the landscape and ecosystems. Moving forward, community and organizational climate actions should be co-developed with First Nation communities and Knowledge Keepers. This will enable everyone to learn from First Nations science, help reduce the disproportionate burden of climate impacts on these communities and uphold commitments to Truth and Reconciliation. The BC First Nations Climate Strategy and Action Plan includes [20 urgent calls for climate action](#) ⁷⁵ that should be considered.

Kanaka Bar Climate Action

Kanaka Bar Indian Band (KBIB) is one of 15 First Nation communities that make up the Nlaka'pamux Nation. The community of Kanaka Bar is located near Lytton and has been engaged in [comprehensive climate planning and action since 2016](#) ⁷⁶.

KBIB has dedicated leadership related to climate action, resilient governance structures, and a community vision that states, "Kanaka Bar is committed to using its lands and resources to maintain a self-sufficient, sustainable and vibrant community." Some of KBIB's completed projects include a permaculture initiative, a beekeeping initiative, community solar project, Siwash Creek hydroelectric project, a climate change vulnerability assessment, and a community resiliency plan. Kanaka Bar is also deeply involved in ongoing work to address heat, drought and wildfires which are particularly threatening in their area.

Métis Nation BC

The Métis Nation British Columbia (MNBC) represent Métis citizens across B.C. including the 15 Métis Chartered Communities in the Interior Health region. MNBC's mandate is to develop and enhance opportunities for Métis communities by implementing culturally relevant social and economic programs and

services. MNBC is organized into 18 ministries including a Ministry of Health and Ministry of Environmental Protection, Agriculture and Food Sovereignty which work collaboratively on climate change and emergency management. MNBC recently released a report on [climate change and food access](#) ⁷⁷, highlighting current and future actions.

Local Government

The effects of climate change on local government operations and budgets include cleaning up after severe weather events, impacts on vulnerable populations and ecosystems, and the loss of key economic drivers such as tourism. Local governments can be leaders in responding to climate change through a myriad of innovative actions in collaboration with other sectors and organizations. Focusing on the co-benefits of climate action can help to achieve a variety of community priorities in addition to climate change and ensure an efficient and effective use of the resources available to local governments.

City of Nelson Comprehensive Climate Plan

[The Nelson Next Climate Plan \(Nelson Next\)](#) ⁷⁸ takes an integrated approach to addressing climate change in this Central Kootenay community. The long-range plan uses a low-carbon resilience framework. Low-carbon resilience integrates climate mitigation and adaptation actions across departments and sectors with a focus on co-benefits. Health and well-being were clearly identified as co-benefits within the framework. The plan also lists strategies and tactics that emerged from best practices research and a thorough process to engage the community and subject matter experts. This process included public surveys and online engagement, meetings with a cross-sectoral Working Group on Climate Action, workshops with community experts, leaders and city council, and a social innovation lab to support community action.

The City of Nelson has implemented several [climate programs](#) ⁷⁹ since the plan was approved in 2020.



Community organizations

In small communities, community organizations often play a key role in mobilizing and implementing climate adaptation action at the local level.

Organizations that serve populations that are more vulnerable to climate impacts can assist in extreme weather event responses, and ensure actions address the needs of those most impacted.

Community organizations and non-profits that are focused on climate change commonly play an advocacy role, and influence decision-making and policy both locally and further afield.

[Community Climate Hubs](#) exist in regions across the country including in the Interior Health region. They support citizen-led, grassroots organizing at the local level. Community Climate Hubs currently exist in the [East Kootenay](#), [West Kootenay](#) and the [Okanagan](#).

Post-secondary institutions

Post-secondary institutions, including colleges and universities, can support research and data gathering to inform local climate action. Post-secondary institutions also conduct research on other determinants of health that are impacted by climate change such as housing and local economies. Communities can also benefit from the capacity of students through co-op and practicum experiences focused on climate action.

Selkirk College Columbia Basin Climate Source

Produced through a partnership between Columbia Basin Trust's Climate Action Program and Selkirk Innovates (Selkirk College), the [Columbia Basin Climate Source](#) provides climate change information relevant to communities in the Columbia Basin-Boundary region. This information includes climate projection data for Basin-Boundary communities, regionally relevant impacts, a database of local climate action examples, resources to inspire further action, and clear guidance on how to make sense of climate science.

Private sector organizations

Private sector organizations often have financial resources that are earmarked and can be accessed to support environmental sustainability and community priorities for climate action.

Big White Ski Resort – As part of the community response to the 2023 wildfire season, Big White Ski Resort [opened and extended hours of facilities and services](#) to wildfire evacuees and hosted community fundraising events.

Recommendations

The recommendations within this report are intended for the public, the health sector, and community and provincial partners. Climate change and its impacts cannot be addressed by just one organization or one sector.

Everyone has a role to play. Identify an action that you can take within your own family, neighbourhood or community. All actions will have an impact. For example, share personal stories about the impacts of climate change on you, your family and community. This can help to build collective responsibility and commitment to finding common ground.

Together we can lessen our impact on the environment and build resilience to climate change.

Urgent action across different sectors, including health, is required to effectively support climate resilience. This requires an in-depth understanding of the issues, and engaging and learning from those with Indigenous knowledge and lived experience of impacts of climate change.

IN THIS SECTION:

Recommendations	46
Appendices	47
References	49

The following are recommendations directed toward key sectors and partners who can lead and champion innovative actions that promote health, well-being and climate resilience at the community level:

 Interior Health	 Community Partners (Including local authorities, post-secondary institutions, non-governmental organizations, community agencies and service providers)	 Provincial Partners (Including the Provincial Government, ministries and agencies)
<p>Fulfill health sector commitments toward climate change as outlined in the:</p> <ul style="list-style-type: none"> • IH Indigenous Health and Wellness Strategy, including: <ul style="list-style-type: none"> • Responding to public health and environmental crises and emergencies in partnership • IH-MNBC Métis Health and Wellness Plan, including: <ul style="list-style-type: none"> • Enhancing emergency management outcomes through shared emergency response planning • Building self-determined, strength-based emergency management systems and engage in climate readiness initiatives <p>Implement actions within the Climate Change and Sustainability Roadmap, and fulfill commitments to B.C.'s Climate Preparedness and Adaptation Strategy and CleanBC Roadmap to 2030, including:</p> <ul style="list-style-type: none"> • Foundational – Establish governance and accountability structures within the organization • Infrastructure – Minimize climate risk to IH facilities and infrastructure, and increase climate resilience through assessments and tactical plans • Clinical – Integrate environmental sustainability practices into clinical operations • Community – Engage, outreach and collaborate with community partners, local governments and Indigenous partners on actions to respond, adapt to and mitigate climate change impacts <p>Apply what was learned from the 2023 wildfire season and past years to health sector preparedness and response to climate-related events.</p> <p>Create and endorse policies and programs that promote the co-benefits of health system action on climate change.</p>	<ul style="list-style-type: none"> • Support Indigenous-led actions to adapt to climate change and protect the natural environment. • Partner with IH on climate change and health vulnerability and adaptation assessments, including implementation of adaptation plans. • Work in partnership with IH and other partners on heat, cold, flooding, drought, wildfire and smoke preparedness and response that will help ensure health and well-being for all citizens. • Endorse policies and programs that build on community assets and promote the co-benefits of climate action on health and well-being. 	<ul style="list-style-type: none"> • Centre discussions in alignment with Indigenous perspectives and invite these voices and contributions. • Respect and recognize First Nations' right to self-determination and self-government in climate action over their traditional territories • Align vision and goals on climate change and sustainability across provincial ministries and establish an integrated systems approach to climate change mitigation and adaptation. • Strengthen and formalize provincial climate change and health governance structures to streamline accountability and provide effective support for community-level actions. • Ensure equitable allocation of resources to communities and populations that are most impacted by climate change, or have lesser means to prepare and respond, and ensure their experiences are reflected in provincial and regional solutions. • Coordinate health assessments and surveillance in relation to climate change and health, including qualitative and quantitative data and other forms of knowledge.

Appendices

Glossary

Climate – The average of weather patterns in a specific area over a longer period, usually 30 or more years, that represents the overall state of the climate system. Human activity in the industrial age, and particularly during the last century, is significantly altering our planet’s climate through the release of harmful greenhouse gases.¹

Weather – Atmospheric conditions at a particular time in a particular location, including temperature, humidity, precipitation, cloudiness, wind and visibility. Weather conditions do not happen in isolation: they have a ripple effect. The weather in one region will eventually affect the weather hundreds or thousands of kilometers away.¹

Climate change – The long-term changes in the Earth’s climate that are warming the atmosphere, ocean and land. Climate change is affecting the balance of ecosystems that support life and biodiversity and is impacting our health. It also causes more extreme weather events, such as more intense and/or frequent hurricanes, floods, heat waves and droughts, and leads to sea level rise and coastal erosion as a result of ocean warming, melting of glaciers and loss of ice sheets.¹

Climate adaptation – Actions that help reduce vulnerability to the current or expected impacts of climate change like weather extremes and natural disasters, sea-level rise, biodiversity loss, or food and water insecurity. Many adaptation measures need to happen at the local level, so rural communities and cities have a big role to play. Such measures include planting crop varieties that are more resistant to drought, practising regenerative agriculture, improving water storage and use, managing land to

reduce wildfire risks, and building stronger defences against extreme weather like floods and heat waves.¹

Climate resilience – The capacity of a community or environment to anticipate and manage climate impacts, minimize their damage, and recover and transform as needed after the initial shock. Ultimately, a truly climate-resilient society is a low-carbon one, because drastically reducing greenhouse gas emissions is the best way to limit how severe climate impacts will be in the future. It is also a society based in equity and climate justice that prioritizes support for people and communities most exposed to climate impacts or least able to cope with them.¹

Indigenous knowledge – Indigenous Peoples’ ways of life are inherently low-carbon and emphasize balance between humans and the natural world. Their traditional practices have a low impact on the environment and are responsive to it, fostering self-sustaining ecosystems. Indigenous Peoples were among the first to notice climate change and their knowledge and practices help navigate and adapt to its impacts. Indigenous knowledge, which is intergenerational and community-based, is an important source of meaningful climate solutions that can advance mitigation, enhance adaptation and build resilience.¹

Health equity – Health equity means that all people can reach their full health potential and should not be disadvantaged from attaining it because of their race, ethnicity, religion, gender, age, social class, socio-economic status or other socially determined circumstance.²

Emergency Operations Centre (EOC) – An EOC describes the structures and processes that are activated to respond to an emergency. It brings together key decision makers and experts in a consistent structure to guide the response and ensure integration with the EOCs of other organizations. An EOC is responsible for providing policy and strategic direction, providing site support and consequence management, collecting, evaluating and distributing information, coordinating agencies and/or departments, managing resources, providing both internal and external communications regarding the situation.³

Atmospheric river – A flowing column of condensed water vapour in the atmosphere responsible for producing significant levels of rain and snow. When atmospheric rivers move inland and sweep over the mountains, the water vapour rises and cools creating heavy precipitation. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property.⁴

PM_{2.5} – Fine particulate matter are particles in the air that measure less than 2.5 micrometers (µm) in diameter, and typically consists of a mix of things like smoke, soot, liquid or solid particles in aerosol, or biological matter like mold, bacteria, pollen and animal dander. PM_{2.5} poses a risk to your health because, when inhaled, it can travel deeply into your lungs.⁵

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2. https://nccdh.ca/images/uploads/lets_Talk_Health_Equity_English.pdf
3. <http://www.phsa.ca/about/news-stories/stories/the-critical-role-of-our-emergency-operations-centres>
4. <https://www.noaa.gov/stories/what-are-atmospheric-rivers>
5. <https://www.canada.ca/en/health-canada/services/publications/healthy-living/infographic-fine-particulate-matter.html>

Appendices continued



Key Documents and Resources

Foundational Documents

[Health of Canadians in a Changing Climate](#) ↗

[The 2023 Report of the Lancet Countdown on Health and Climate Change](#) ↗

Community-Level Action

[Climate Atlas of Canada](#) ↗

[Heat Response Planning for Southern Interior B.C. Communities: A Toolkit](#) ↗

[Climate Action & Innovation in Canadian Municipalities](#) ↗

[Union of BC Municipalities Climate Funding Programs](#) ↗

Indigenous Climate Action

[Canada in a Changing Climate – Regional Perspectives](#) ↗

[Climate Change and Indigenous Peoples in Canada: Health Impacts](#) ↗

[Indigenous Knowledges and Climate Change | Climate Atlas of Canada](#) ↗

[BC First Nations Climate Strategy and Action Plan](#) ↗

[Métis Nation British Columbia Climate Change & Food Access Survey Report](#) ↗

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