



The Environment

Growing and interacting pressures

The health of the world's environment is connected to the health of humanity. Scientists and citizens around the world are ringing the alarm bell about current and predicted challenges due to environmental issues. Climate change, extreme weather and collapsing ecosystems have the potential to significantly impact humans and society. The Basin and its people face some of these impacts, with the following currently happening or expected to happen over the coming decades: increased forest fires and floods, declining wildlife populations, changes in snowpack and melting glaciers. People must meet these current and future challenges with strong responses. Globally, the world is starting to take action as new policies, industries and technologies emerge to remove risk factors, lessen impacts and adapt to changes. In Canada, action on climate change and conservation at all levels of government is showing how we're more willing to focus on and address environmental challenges.

Note: This short research brief was informed by reports prepared for Columbia Basin Trust by [Stratos Inc.](#) This information is free to use in a way that is consistent with the intent of the original papers.

Understanding global trends

INCREASES IN EXTREME WEATHER

Climate change is increasing the frequency and severity of extreme weather events, including storms, droughts and heatwaves, and associated natural disasters like floods and wildfires. These events pose a threat to human health and safety, infrastructure, employment and economic prosperity. New realities relating to local climates and weather may change how people around the world and within countries move and settle.

What the research tells us

- ↳ Many authorities identified extreme weather events as among the greatest global risks in 2019ⁱ.
- ↳ In Canada, the cost of extreme weather was expected to hit \$5 billion per year by 2020—12 times higher than the average from 1983 to 2008ⁱⁱⁱⁱⁱ.
- ↳ The 2017 and 2018 wildfire seasons set new records in BC, burning over one million hectares for the first time since 1950.

ECOSYSTEMS AT RISK

Global ecosystems are being pushed to their limits, threatening the capacity of the planet to provide water, food, employment and security to the 7.7 billion people that rely on them. Benefits of the natural environment—such as pollination, flood protection and clean drinking water—are also under threat. One estimate puts the economic value of these benefits at US\$125 trillion per year. Some of the biggest threats come from habitat loss, invasive species, chemicals and climate change. Changes to the availability and quality of fresh water may impact health, international relations and sectors that rely on water, like agriculture, food processing and manufacturing.

What the research tells us

- ↳ Globally, human activity has increased the total of all extinction rates to an estimated 1,000 times the natural rate.
- ↳ Almost half the wildlife species being monitored in Canada are in decline, having lost an average of 83 per cent of their populations between 1970 and 2014^{iv}.
- ↳ The population of mountain caribou in the Basin declined by 68 per cent from 1996 to 2016.

- ↳ On average, the volume of ice in Basin glaciers dropped by 14 per cent between 1985 and 2005^v.

COLLECTIVE RESPONSE

Around the world, domestic and international policies are making environmental protection a greater priority. Laws, standards and expectations are evolving to help protect land and water and reduce the negative impacts of climate change. Governments of all levels, as well as industries and non-profits, will need to continue to strengthen and speed up their efforts to ensure the long-term well-being of the environment we all rely on.

What the research tells us

- ↳ By 2020, approximately 17 per cent of the globe's terrestrial (land-based) areas will be protected^{vi}.
- ↳ Between 1990 and 2019, the amount of protected terrestrial areas in Canada rose from 8.2 per cent to 15 per cent, and marine areas from 0.4 per cent to 7.6 per cent^{vii}.
- ↳ Canada is one of about 40 countries, along with several organizations, that currently have carbon pricing mechanisms in place.

FOCUSING ON ADAPTATION AND RESILIENCE

With greater awareness of environmental threats, more and more people around the world are demanding better ways to adapt to climate change. To be successful, we need to rethink and adjust our built environments and socio-economic systems to better respond to current and expected realities. These adjustments may vary and depend on the region, ranging from building flood defences, to switching to drought-resistant crops, to changing building codes and standards.

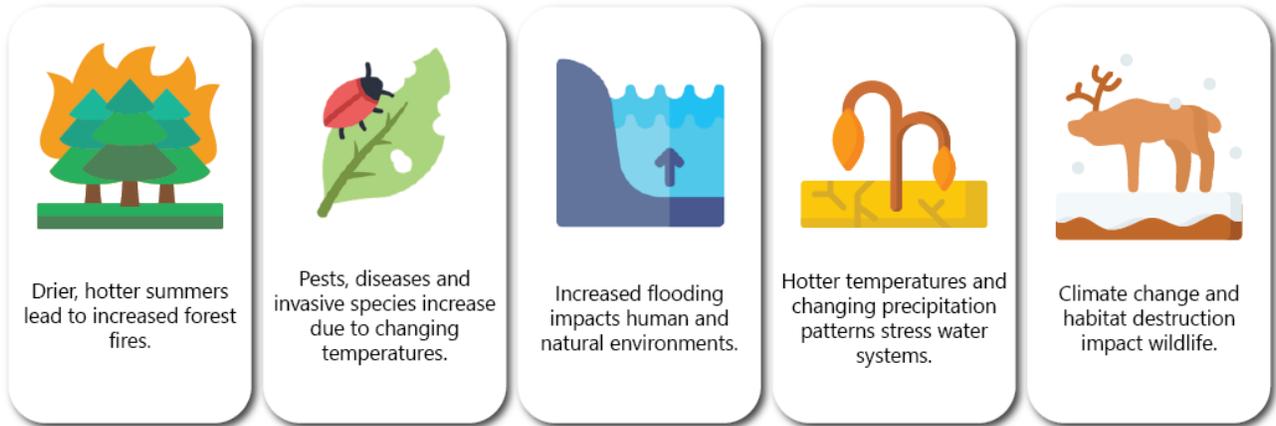
What the research tells us

- ↳ Increasingly, countries are implementing policies that support climate adaptation measures^{viii}.
- ↳ The Government of Canada increased its investment in adaptation programming from \$86 million (2007 to 2011) to \$149 million (2011 to 2016)^{ix}.
- ↳ In the Basin, the Harrop-Procter Community Forest is an example of how climate science and risk assessment can be used to adapt how forests are managed in response to the changing climate^x.

What could this mean for the Basin?

Home to four of the province's seven national parks, the Basin is known for its abundance of rich wilderness and natural beauty. From wetlands to the alpine, the Basin's ecosystems provide biological diversity, agricultural land, clean air and water, and a host of other benefits that increase people's social and economic well-being. The environment is also a critical piece of the culture, traditions and day-to-day lives of all people in the Basin.

Here are some of the impacts the Basin may experience in coming years:



Drier, hotter summers lead to increased forest fires.

Pests, diseases and invasive species increase due to changing temperatures.

Increased flooding impacts human and natural environments.

Hotter temperatures and changing precipitation patterns stress water systems.

Climate change and habitat destruction impact wildlife.

These challenges and others could impact the composition and health of the Basin's environment, posing risks and creating uncertainty. However, there are many current and planned initiatives that will help the region reduce the impacts of these circumstances and effectively adjust. Governments, residents, businesses and communities are implementing strategies like policies, assessments and studies; making use of new technologies; and continuing to speak with one another, collaborate and form partnerships.

How can the potential impacts be addressed?

There are many ways people and organizations in the Basin can adapt to situations like those mentioned above. Here are a few ideas.



Use access to real-time weather data to help farmers plan and make decisions.

Help communities implement FireSmart practices so they can protect themselves, their resources and their assets against the impacts of forest fires.

Restore and rehabilitate ecological systems to prevent and lessen the severity of floods.

Protect the habitats of vulnerable species to support populations and well-being.

Support a healthy environment by having watershed stewardship groups do activities like water monitoring and education.

ECONOMY

Like the economies of many other rural areas in Canada, the Basin's economy relies in part on the area's abundant natural resources. Forestry, agriculture, mining, fishing and hunting are all key economic drivers across the region^{xi}. The Basin also has a vibrant tourism industry, with many visitors drawn to the region for its wilderness and outdoor recreation^{xii}.

As the Basin's environment changes, key economic sectors may be affected. Some potential impacts include:

- ↳ changes in forest composition and harvest levels
- ↳ increased forest productivity in some areas and reduced productivity in others
- ↳ disruptions to operations and road closures
- ↳ seasonal changes in water levels, impacting hydropower production
- ↳ shifts in fish species
- ↳ less predictable seasons for tourism operators (shorter ski season, longer summer season)
- ↳ more regulations in place to address environmental impacts^{xiii}.

It is important for key economic sectors to address environmental change. They must understand potential impacts and learn to adapt to these changes. Uncertainty around how the environment will change has prompted some areas to explore diversifying their economies.

BUILT ENVIRONMENT

Houses, buildings, roads, bridges, dams and wastewater facilities are all part of the built environment in the Basin. They play important roles in supporting the region's economy and quality of life^{xiv}.

In many Basin communities, however, infrastructure assets are aging^{xv} and may not be able to withstand the various environmental stressors anticipated in coming years^{xvi}. They may be affected by events such as increased peak stormwater flows that lead to flooding; increased freeze/thaw stress on road surfaces, buildings and pipes; and wildfires^{xvii}.

Communities can address a range of environmental objectives by building and updating infrastructure to make it better able to withstand environmental stressors, become more energy efficient and reduce greenhouse gas emissions. These types of outcomes

can be achieved through design, construction and a range of adaptations and management practices.

CULTURE AND INDIGENOUS RIGHTS

The Basin's natural environment is an important part of individual and community identity, culture and well-being. Indigenous peoples in the Basin have rights and titles that are inextricably connected to the land and its resources. Their culture, identity, traditional food and traditional governance are interwoven with the land and water^{xviii}.

Environmental pressures like climate change could redefine the relationships between Indigenous peoples and the landscape, impacting their identity, ways of living and well-being^{xix}. For example, changes to biodiversity and habitat could result in a loss of hunting opportunities.

As these changes occur, some communities are placing greater emphasis on linking environmental impacts to well-being. The result is a range of tools to help communities understand, monitor and manage these links. Examples include combining traditional ecological knowledge, science and other knowledge systems; creating new forms of partnerships and collaborations, like the Columbia Basin Watershed Network; and taking more local action through community-based monitoring programs like the Indigenous Guardian Program, which helps communities manage ancestral lands according to traditional laws and values.

HEALTH AND HUMAN EXPERIENCE

Overall, people in the Basin are satisfied with their quality of life and believe it's supported by a healthy environment^{xx}. However, locals and tourists are becoming more concerned about poor air quality caused by wildfires (primarily in the summer months).

Changing environmental conditions could also impact people's health. Some identified health risks in BC include the increased number of heat-related illnesses, increased presence of diseases transmitted by carriers like mosquitos and ticks, and reduced water quality resulting from higher concentrations of water-borne pathogens and contaminants^{xxi}.

Linkages

RELATED TREND PAPERS

- New technology
- Health and wellness
- A globalized world
- Lives and communities
- Toward a sustainable economy



Trends in the environment **influence:**

Shifting demographics

Extreme weather events like heat waves could impact more susceptible members of society, including aging populations.

Emerging biological threats

Melting ice and permafrost due to climate change could release dormant bacteria and viruses that have been trapped for centuries.

Responsible sourcing

Environmental trends are pushing consumers to purchase goods and services with reduced environmental impacts throughout their supply chains (for example, greenhouse gas emissions).

Mental health and loneliness

Climate change impacts on mental health can range from mild stress to more serious disorders like depression and “eco-anxiety.”

Demand for jobs and skills

Environmental changes and resulting policy decisions can impact labour markets, including through the emergence of the green economy and related green jobs.



Trends in the environment are **influenced by:**

Big, open data

New technologies, including remote monitoring and big data analysis, can enable better planning, policies and management of the environment.



Trends in the environment are **interconnected with:**

Move to low-carbon economy

As environmental trends demand shifts in how we produce and consume, new economic realities can also shape our environment.

Move to circular economy

Environmental issues, like pollution from plastics and chemicals, increase society’s demand for a circular economy.

References

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