



Climate Change in the Columbia Basin

Expected changes in temperature and precipitation
will mean changes for you and your community



Get informed
Get ready
**Join the
dialogue**

Glaciers and snow are a familiar part of the landscape across the Columbia Basin. It's hard to imagine a future with fewer or smaller glaciers and no snow in low-elevation areas, but that's exactly what a team of scientists and leading experts in climate change are predicting. Understanding and preparing for future climate changes in your community is important.

Get the Facts

The Columbia Basin Trust (CBT), in response to direction received from Basin residents, worked with the Pacific Climate Impacts Consortium from the University of Victoria and a number of other government and academic institutions to research historical and future predicted climate change impacts in our area.

The result is a detailed technical document, *Preliminary Analysis of Climate Variability and Change in the Canadian Columbia River Basin: Focus on Water Resources*, as well as a summary document, *Climate Change in the Canadian Columbia Basin: Starting the Dialogue*. **Get these free documents online at www.cbt.org/climatechange**



Join the Dialogue

The CBT has made it a priority to help Basin residents understand climate change and how the predicted changes will impact you, your family, and your community.

That's why we want to start a dialogue with you to discuss some of the predicted changes and impacts and explore potential ways we can adapt to the changes in the future.



OUR LOCAL CLIMATE IS CHANGING

Changes in the Columbia Basin

Temperature changes are already affecting the Columbia Basin and that means changes in the future for you and your community. Here’s an overview of what we know now about temperature changes and what those changes may mean for local water resources.



Changing Temperatures

- In the last century, the average temperature in the Basin has increased by 1.5° C.
- Most of the warming has occurred in the last 30 to 50 years.
- Summers are getting a little warmer but winters are getting a lot warmer.

More Rain & Less Snow

- More precipitation is falling as rain instead of snow, especially at lower elevations.
- Results from five Basin weather stations show increases in rainfall from 0 to 45 per cent (1913 – 2002).

WHAT WE HAVE SEEN
IN THE PAST IS NOT WHAT
WE WILL SEE IN THE
FUTURE

Melting Glaciers

- Glaciers in the Basin have shrunk on average 16% based on a 15-year period ending in 2000.
- The Slocan (in the West Kootenay) and Bull River (in the East Kootenay) watersheds lost 47% and 60% of total ice area.
- Melting glaciers have increased streamflows, especially in the summer.

Less Winter Snowpack

- Between 1950 and 1997, snowpack declined by 20 to 40 per cent in the entire Columbia Basin.
- The greatest reductions were at lower elevations.

Changing Stream & River Flows

- Between 1984 and 1995, spring runoff – freshet – occurred 20 days earlier than it did between 1970 and 1983.
- A warmer climate and lower summer precipitation means longer periods of lower streamflows at the end of the summer.
- More rain in the fall and winter is increasing streamflows in the winter.

WHAT YOU CAN EXPECT



- Higher summer temperatures
- Warmer winters
- Decline in low-elevation snowpack
- Longer, hotter summers
- Receding glaciers



- Earlier spring freshet (snow melt)
- Lower water levels in streams during the summer, and higher levels in winter
- Reduced soil moisture
- More extreme weather events and increased variability in weather

Local Communities Taking Action

An important place to start to prepare for climate change is at the local and regional levels where the impacts are felt and their significance understood. *Changing Climate, Changing Basin* is a regional planning and action initiative with local governments and First Nations to take tangible steps toward preparing for climate change impacts. The initiative is a partnership between the CBT and a variety of local government agencies, provincial organizations, and academic institutions.

The goal of the *Changing Climate, Changing Basin* initiative is to support communities in the Canadian Columbia Basin to:

- increase their adaptive capacity and resiliency related to climate change impacts at a local community level; and
- address climate change at a local community level by identifying the range of potential impacts, assessing local vulnerabilities and sensitivities, and developing strategies for addressing climate change impacts.

WANT MORE INFORMATION?

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Start Thinking About Local Impacts

Here are a few tangible examples of the local impacts climate change may bring about and potential ways we can adapt. By understanding the potential future changes, we will be able to plan, adapt, and increase our resilience.

Water Supply

The Columbia River Basin is extraordinarily important as a high-quality fresh water resource for agriculture, fisheries, and power-generation. It is also a vital source of drinking water for people living in the Basin and the foundation for recreational and tourism activities.

- Higher temperatures and less summer precipitation may lead to more prolonged and intense droughts. One way to adapt to those changes would be to step up water conservation efforts.
- Higher winter streamflows and severe rain events may cause flooding. Adapting to that change may mean increasing flood protection or redesigning water infrastructure.

Safety & Transportation

Making sure the infrastructure in our towns and communities can cope with changes in precipitation and water flows is key to our safety.

- Higher winter streamflows and extreme precipitation events could increase the risk of more frequent or severe floods and landslides which may damage roads and railways. We can adapt by taking protective engineering measures and designing roads to accommodate these impacts.
- If there is an increased risk of interface fires that may threaten homes and communities, we can adapt to that threat by creating more “firesmart” forest interfaces.

Public Health

Some of your neighbours may be more vulnerable to changes in temperature due to health concerns, or they may simply be more sensitive to changes because of where they live and how prepared they are.

- People with sensitivity to heat may find it difficult to cope with increasing temperature in the summer. Adapting to this change may require more health services.
- Smoke from wildfires may make it necessary to improve air quality warning systems.



Hydro-electric Power

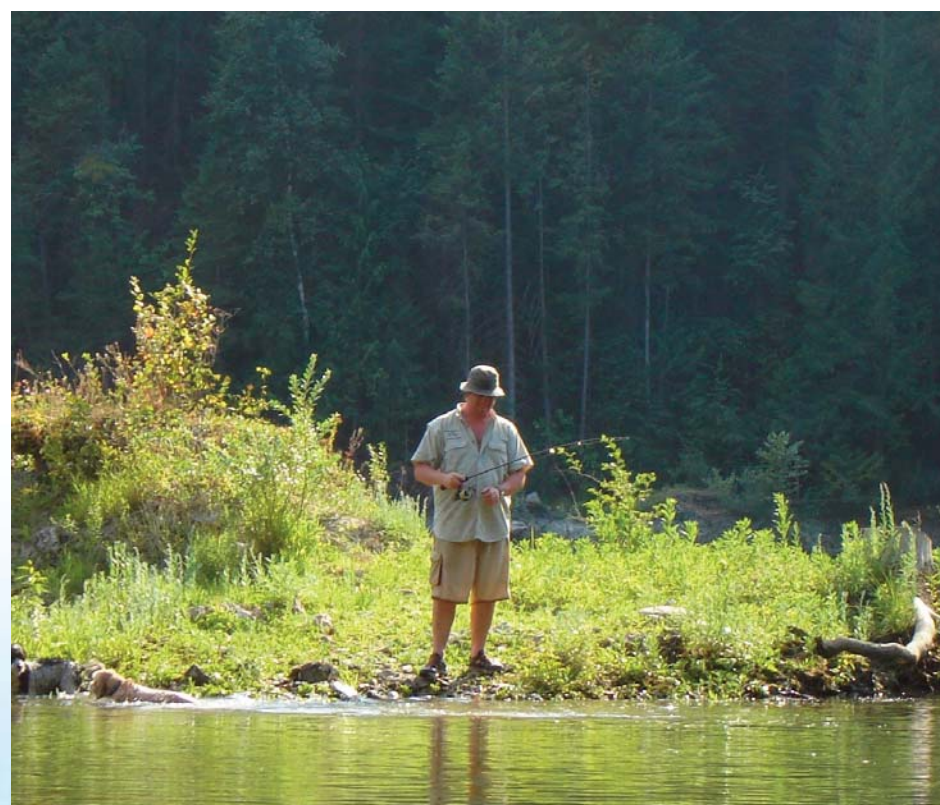
There are 18 major dams on the Canadian portion of the Columbia River system that generate about half of all hydro power produced in BC.

- Changing streamflow patterns may reduce hydro production, especially in the summer and fall when demand is usually high. We can adapt by adjusting reservoir operations to meet new hydro demand times and improving hydro supply & demand projections.
- It may be more difficult to maintain current reservoir and flow levels, but we can adapt by adding water storage facilities and changing reservoir operations.

Forests

Forests are an integral part of life in the Columbia Basin—as both an economic backbone and a place of recreation. Healthy forests support our wildlife populations and water systems.

- Warmer temperatures may have an influence on which tree species grow in the Basin, so it may be necessary to adapt by planting tree species suited to future climate conditions.
- Warmer winters may shorten the winter logging season. To adapt to this change, it may be necessary to look at harvesting technologies that will help maintain winter logging seasons.



THINK ABOUT THE
CHAIN REACTIONS CAUSED
BY CHANGES IN
TEMPERATURE AND
PRECIPITATION

Recreation & Tourism

Outdoor recreation is a vital part of the mountain lifestyle for many of us living in the Columbia Basin. Tourism, based on our outdoor recreation opportunities, is an essential sector of our economy.

- Warmer winters may result in less low-elevation snowfall, lower snowpacks, and earlier snowmelt, which may mean reduced skiing seasons. Adapting to this challenge may mean increased snowmaking, where possible, and grooming slopes to extend the length of time the snow lasts.
- Floods and high streamflows could damage fish habitat; adapting to changes in water flows may mean taking steps to protect fish habitats.

Agriculture

Agriculture in the Basin typically depends on streamflow derived from glacier runoff and snowmelt delivered to crops via irrigation during summer when precipitation and streamflow are lowest. While warmer temperatures may improve the potential for some high-value crops, this will only be realized if enough water is available.

- Less summer precipitation and warmer temperatures may reduce soil moisture and increase irrigation needs. That may mean we will have to adapt by using more efficient irrigation methods to make the most of water supplies, or growing crops that require less water.
- Warmer temperatures may mean a longer growing season. Diversifying crops would be one way to adapt to that change.

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How Can You Start Planning Now?

Changes to our climate are inevitable. By understanding what the local impacts may be, we can plan for them and take steps now to adapt to our changing climate.

On a personal level:

1. Accept that the present is, and the future will be, different from the past, and continue to learn about the changes.
2. Expect surprises, and be as prepared as possible.
3. Factor in climate change for long-term decisions.

At a community level:

1. Learn more about local climate change impacts.
2. Based on these impacts, decide what the local vulnerabilities and sensitivities are that will affect your community. For example:
 - Will your community be vulnerable to flooding?
 - Will local drinking water supplies be impacted?

When you understand what the important local sensitivities are and how you may be affected, you can start to understand how to increase your community resiliency and adapt to these changes.

Join the Dialogue!

About the CBT

Columbia Basin Trust is a Crown corporation that began in 1995 with a unique mandate to support the efforts of the people of the Basin to create a legacy of social, economic, and environmental well-being, and to achieve greater self-sufficiency for present and future generations in the region most affected by the Columbia River Treaty.

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- **CBT Water Initiatives Program**
www.cbt.org/water
- **Pacific Climate Impacts Consortium**
www.PacificClimate.org
- **Climate Impacts Group, University of Washington**
www.cses.washington.edu/cig
- **B.C. Ministry of Environment**
www.env.gov.bc.ca/air/climate/index.html#6
- **Environment Canada**
www.ec.gc.ca/climate/home-e.html
- **Natural Resources Canada**
www.adaptation.nrcan.gc.ca/
- **Intergovernmental Panel on Climate Change**
www.ipcc.ch

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TOP 10 WAYS TO REDUCE EMISSIONS

- 1 REDUCE HEATING AND USE OF ELECTRICITY**
 - Install a programmable thermostat
 - Use compact fluorescent light bulbs
 - Upgrade windows and insulation in your homes
 - Visit Natural Resources Canada and read information on how to conserve energy at home at:
<http://oee.nrcan.gc.ca/residential>
 - Install a block heater with an automatic timer
- 2 CHOOSE ENERGY-EFFICIENT APPLIANCES**
 - Replace outdated appliances and office equipment with Energy Star approved equipment
 - Visit <http://oee.nrcan.gc.ca/energystar> for more information
- 3 USE FUEL-EFFICIENT VEHICLES**
 - When it's time to purchase a new vehicle, visit the Canadian Office of Energy Efficiency EnerGuide Awards to find the most fuel-efficient vehicles:
<http://oee.nrcan.gc.ca/transportation>
 - Keep your tires inflated correctly to maximize fuel consumption
- 4 STOP IDLING**
 - Turn off your engine while you wait in lines
- 5 DRIVE LESS**
 - Walk, cycle, carpool, or take transit
 - Use teleconferences or video-conferences at work
- 6 REDUCE, REUSE, RECYCLE**
 - Use cloth bags for shopping
 - Double side when printing and use recycled paper
 - Reduce water usage by installing automatic timers on sprinklers and low-flow shower heads
- 7 SHOP SMART**
 - Buy products with less packing
 - Buy fresh
- 8 PLANT TREES AND VEGETATION**
 - Use trees and bushes for shade around your home instead of an air conditioner
 - Plant species native to your area
- 9 CAPTURE THE SUN'S ENERGY**
 - Use solar heating
 - Use a clothesline
- 10 BUY LOCALLY GROWN FRUITS, VEGETABLES, AND MEAT**
 - Visit your local farmers' market or fruit stand
 - Avoid buying foods that have been shipped long distances to your community

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