Climate Action in the Columbia Basin
The Call for Climate Action

Local and global weather patterns are changing, and extreme weather events are happening more often. The last three years — 2015, 2016 and 2017 — were the hottest on record since 1880, and 17 of the last 18 years topped the list.1 The global scientific consensus confirms that action is needed to reduce our human contribution to climate change and avoid a future that is “too hot to handle.”2 Columbia Basin residents have told Columbia Basin Trust that one of their priorities is responding to climate change.

From more threatening wildfires to bigger spring floods, climate change is affecting our landscapes and how we live within them.

Effective climate action means radically reducing the greenhouse gas (GHG) emissions causing climate change and preparing for a warmer and more variable climate than that of the past 100 years. Canada has proposed a long-term goal to reduce GHG emissions by 80 per cent by the 2050s (from 2005 levels).

The Call for Climate Action

How is the Basin’s climate changing?*

- Hotter, drier summers
- Warmer, wetter winters
- More extreme precipitation

According to Environment Canada’s temperature records, average annual temperatures in the Basin have increased by 1.6ºC over the last century, and the current rate of warming is 3.1ºC per century. The maps below illustrate how average annual temperatures have changed since 1960 and how they are projected to change by the 2050s.

Annual average precipitation in the Basin has increased by as much as four per cent per decade since the 1900s, yet the rates vary by season. Generally, precipitation in winter and summer has been decreasing, and spring precipitation has been increasing. Many communities are experiencing more of their winter precipitation as rain.

Current global climate models are projecting average seasonal temperatures to be 2.4 to 3.6ºC warmer in the 2050s compared to the baseline decades of 1961 to 1990. Summers may be up to 15 per cent wetter and summers up to 14 per cent drier.

Without substantial global reductions in GHG emissions, Basin residents can expect, depending on their location, anywhere from nine to 32 more days per year over 30ºC. And the maximum precipitation falling on one day in any given year is projected to increase between nine and 26 per cent.

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Changes in September to May rainfall and snowfall since 1931-1960*

<table>
<thead>
<tr>
<th>Location</th>
<th>Rainfall Change</th>
<th>Snowfall Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>KASLO</td>
<td>+27% more rain</td>
<td>-16% less snowfall</td>
</tr>
<tr>
<td>GOLDEN</td>
<td>+56% more rain</td>
<td>-13% less snowfall</td>
</tr>
<tr>
<td>CRANBROOK</td>
<td>+41% more rain</td>
<td>-13% less snowfall</td>
</tr>
</tbody>
</table>

*Percentages reflect the difference between the average September to May rain and snowfall between the 2011-2016 and 1931-1960 periods.

Changes in glacial runoff: Between 1985 and 2013, there was a 23 per cent loss of total glacial area in the Basin. Glacier retreat is expected to continue.

Increase in the frequency and severity of wildfires: Caused by increases in summer temperature, very hot days and longer warm spells; reduced summer precipitation and extended droughts; and, increases in wildfire fuel accumulation and pest outbreaks.

More landslides and changes in avalanche frequency: Increases in winter precipitation and the increased frequency of extreme rainfall events could contribute to increased landslide frequency. The effects on avalanche size and frequency are still uncertain.

Why one or two degrees matter

While the rise of average annual temperatures by a degree or two may sound insignificant, the consequences can be considerable.

A one-degree increase in annual average temperature equals approximately 35 days of the year being 10ºC warmer than normal.

For every additional degree of warming, the atmosphere can hold seven per cent more moisture, which increases the likelihood of extreme precipitation events. By comparison, only 4 to 5ºC has separated Earth’s glacial (“ice age”) and interglacial periods, which is the difference between enjoying our current climate and vast ice sheets covering much of North America, northern Europe and Asia.

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Current and projected climate change impacts*

Climate changes are expected to broadly impact the natural environment, which is deeply interconnected with the Basin’s economy and quality of life. Floods, wildfire and extreme weather can damage and disrupt infrastructure and landscape-based activities such as forestry, agriculture, mining, recreation and tourism.

Changes to species and ecosystems: Some species will be resilient to new conditions, while others may migrate north or upslope to stay within suitable climate conditions. Some species may not be able to migrate and may decline. New invasive species may take advantage and move in.

Increase in water temperature: Rising summer air temperatures are expected to increase water temperatures in Basin streams and lakes, affecting temperature-sensitive species.

Changes in glacial runoff: Between 1985 and 2013, there was a 23 per cent loss of total glacial area in the Basin. Glacier retreat is expected to continue.

More frequent and intense droughts: Expected due to a combination of lower winter snow packs at lower elevations, less summer rainfall and warmer summer temperatures with more hot days and longer warm spells.

Increasing stream flow patterns: Expect earlier peak flows in spring, a decrease in late-summer flows and more rapid runoff in rivers and streams.

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* For additional information on climate change impacts to Basin water resources, see Water Monitoring and Climate Change in the Upper Columbia Basin, available at ourtrust.org/climateaction.
A global call to action

The most recent global scenarios show that business as usual—in which worldwide GHG emissions continue to increase at the same rate as the last 15 to 20 years—will result in global temperatures 3.2 to 5.4°C higher than 1850 to 1900 by the end of the century. This is hotter than anything the planet has experienced in the last 600,000 years. In this scenario, a Basin summer in the 2050s could be 4°C warmer, with seven to 15 per cent less precipitation compared to 1961 to 1990. The international scientific consensus states that long-term global climate stability depends on reducing global GHG emissions from human activity to zero by the end of this century. The 2015 Paris Agreement outlines a global action plan to avoid dangerous climate change by reducing GHG emissions to limit global warming to 2°C. It was signed by 194 countries and the European Union.

Greenhouse gas emissions in the Basin

At 23 metric tons of GHG emissions per person per year, Canadians are among the top emitters and energy users in the world. While GHG emissions in the Basin represent a tiny portion of total global GHG emissions, high per capita emissions mean that individual and collective actions in the Basin can have a meaningful impact on progress toward a zero-emissions future.

Community-based GHG emissions, illustrated here, contribute approximately 42 per cent of the Basin’s total. They come from sources over which residents and municipalities can exert significant influence, including transportation, residential buildings, commercial and small- to mid-sized industrial operations, solid waste, emissions from livestock, and deforestation.

The remainder of the Basin’s total GHG emissions—approximately 58 per cent—come from large industrial sources such as smelting, pulp and paper, pipelines and mining facilities. The transportation and residential sectors are the Basin’s next largest sources of GHG emissions.

The science is clear: the less we emit, the less we have to adapt.

Photo credit: Groundswell Network Society

Composting organic waste significantly reduces overall solid waste emissions.

Photo credit: Groundswell Network Society

Ninety-eight percent of the electricity generated in BC comes from hydro-electric power, which makes electric vehicles a leading low carbon transportation choice.

Photo credit: acceleratekootenays.ca
GHG REDUCTION

Improving energy efficiency

Many local governments in the Basin have taken steps to improve the energy efficiency of municipal buildings through simple measures like upgrading insulation or installing more energy-efficient windows. This reduces GHG emissions for buildings that rely on fossil fuels for heating and cooling. In addition, over 500 affordable housing units across the Basin are receiving energy retrofits thanks to support from the Trust’s Energy Retrofit Program, with more to come in 2018.

Communities making progress

Basin communities have already been acting to reduce GHG emissions and adapt to climate change. Low carbon transportation, improving building energy efficiency and reducing waste provide significant opportunities for GHG reductions. Reducing wildfire and flood risk, and preparing for changes to community water supply are focal points for increasing community climate resilience. Here is a snapshot of what communities have been doing.

Reducing GHG emissions

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Communities in many parts of the Basin are reducing wildfire risks by engaging residents and thinning trees in surrounding forests, reducing the available fuel for potential fires and restoring natural resilience and ecological health. For example, the Slocan Integral Forestry Cooperative (SIFCo) has invested nearly $2.8 million since 2008 to make Slocan communities safer, strategically reducing wildfire risk on over 400 hectares. The Union of BC Municipalities, Forest Enhancement Society of BC, Columbia Basin Trust, Federation of Canadian Municipalities, Province of BC, FortisBC and BC Hydro.

Adapting to a changing climate

Diverting organics

The Regional District of East Kootenay completed a successful pilot composting project in 2016. It was supported by Groundswell Network Society and the Community Energy Manager—a position funded by RDEK, BC Hydro, Columbia Basin Trust and facilitated by the Community Energy Association. The voluntary drop-off program diverted 4.29 metric tons of organic material from landfills and reduced GHG emissions by 87 metric tons.

Encouraging low-carbon transportation

Accelerate Kootenays is a $1.5-million initiative to create a network of electric vehicle charging stations across the Basin. The network will include 40 communities, 13 fast-charging stations, 40 level 2 charging stations and 1,870 kilometres of connected electric vehicle travel. It is a leading example of partnerships in action, involving the Community Energy Association, RDEK, RDCK, RDKB, Columbia Basin Trust, Federation of Canadian Municipalities, Province of BC, FortisBC and BC Hydro.

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Preparing for droughts

From 2009 to 2016, the Columbia Basin Water Smart Initiative helped communities learn how to conserve water, which is particularly important as hotter, drier conditions increase water demand and reduce water supply. Many participating communities reduced community water use by two to 39 per cent by the end of 2015, and now continue their water conservation efforts.

Reducing flood risk

Creston updated its storm water infrastructure design guidelines to account for projected changes to the intensity, duration and frequency of extreme precipitation events. These guidelines will ensure that storm water infrastructure and flood control projects are designed to handle extreme precipitation events.

A time to act and innovate

While climate change presents many challenges, it also holds the potential for many innovations that will contribute to cleaner, safer, healthier, more vibrant and more resilient communities. For example, warmer temperatures and longer growing seasons may enable more types of crops to be grown successfully over wider areas. Buildings, infrastructure and transportation will be greener, cleaner and adapted to future climate conditions. Communities can radically reduce current levels of solid waste by embracing the circular economy and continuing to reduce, recycle and re-purpose waste materials. Communities that are resilient and have lower GHG emissions can support healthier, more active lifestyles and improved affordability. In addition, investments into preparing for climate change can significantly reduce costs of recovery from extreme weather events. According to the Federation of Canadian Municipalities, every dollar invested today into climate change adaptation efforts can save $9 to $38 in future damages.

The Trust’s Climate Action Program

In 2017, the Trust launched a three-year Climate Action Program. This program is building awareness, increasing scientific knowledge about how climate change is projected to affect the Basin, and helping Basin communities implement projects to reduce GHG emissions and adapt to climate change. It is also hosting community climate action meetings across the Basin to inform community representatives and help them take action. For more information and resources for climate action, visit ourtrust.org/climateaction.
Getting started
Small-step solutions for climate action

House and home

- Create a 72-hour emergency preparedness kit
- Eat a plant-rich diet
- Reduce food waste
- Take advantage of local recycling opportunities
- Conserve water

Getting Around

- Fly less
- Walk and bike more
- Drive less

Community

- Find out how the climate could change in your community by visiting www.plan2adapt.ca.
- Learn about climate action happening in your area
- Talk with friends and neighbours about climate action