# Cariboo Chilcotin Climate Change Adaptation Strategy

## EXECUTIVE SUMMARY

Cariboo Regional District

Fraser Basin Council

Natural Resources Canada | Ressources naturelles Canada

Canada

## About the strategy

This strategy is the culmination of a 2 year long case study that is part of the British Columbia Regional Adaptation Collaborative (RAC). It focuses on adaptation to a changing climate, rather than mitigation of greenhouse gas emissions and other potential causes of climate change. It focuses on local government services, not the management of natural resources or the environment.

The Cariboo Regional District (CRD) is initiating a Regional Development Strategy (RDS) in the near future that will outline a plan for development looking forward over the next 20 years.

The RAC case study in the Cariboo-Chilcotin sought to create a climate change adaptation strategy to help to create a RDS that helps the region plan for the medium-term by incorporating the projected climate scenarios in the next 30-70 years. As part of the strategy, key "lessons learned" will be shared that other regional districts can apply as they begin considering climate change adaptation into their own plans and strategies.

The steps followed in the development of the strategy were as follows:

- *Learn* – what is each community doing around adaptation, how do they want to be involved, what services do they provide, what are the projected climate change scenarios for the region
- *Share* – through multi-jurisdictional workshops, share local knowledge about sub-regional variations to climate change, which services are vulnerable to a changing climate, how can a RDS help local governments adapt to a changing climate
- *Plan* – summarize what was heard and develop the strategy to feed into the RDS and current plans and operations

## Past and future climate

**Temperature** has warmed by about 1.5C over the past 50 years, and is projected to warm by an additional 1.8C by the 2050s. Winter temperatures have increased at a faster rate than summer temperatures, and will continue to do so.

**Precipitation as snow** has decreased by 24% over the past 50 years, and is projected to decrease by an additional 9% in winter and 55% in spring by the 2050s. Annual precipitation has remained relatively constant but variable across the region.

Anticipated sub-regional variations of future climate scenarios based on past observations:

- **Eastern areas** (i.e., Cariboo Mountains areas from Wells south to Canim Lake area) anticipate *less change from current conditions* in temperature and precipitation
- **Western areas** (i.e., Nazko area of North Cariboo, eastern Chilcotin areas of Riske Creek to Tatla Lake, and Meadow Lake, Canoe Creek and Big Bar areas of South Cariboo) anticipate *more change from current conditions* in temperature and precipitation, and *continued drying of surface water* which could impact groundwater.
- **South Cariboo** anticipates participants anticipate *less change from current conditions* in temperature *in the upper elevations* of their sub-region (i.e., Sheridan and Bridge Lakes), and more change from current conditions in the lower elevation areas (i.e., 108 Mile Lake, Lac la Hache areas).

## Impacts/vulnerabilities of a changing climate to local government services

The following services were deemed most relevant to climate change adaptation. See the strategy for recommendations to address each of the vulnerabilities.

| Current service | Impact or vulnerability due to a changing climate |
|---|---|
| Planning | ▪ Increased importance of planning to identify areas appropriate for development<br>▪ Increased reliance to coordinate local government services |
| Airport | ▪ Decrease in number of commercial flights being able to land<br>▪ Decreased life span of runway infrastructure from increased freeze-thaw cycles<br>▪ Increased use of salt and de-icers |
| Snow clearing | ▪ Increased annual variability in snowfall will create budgeting difficulties<br>▪ Warmer winters with less snow, and increased frequency of rain/freezing rain/mixed precipitation events will require more salt and de-icers |
| Roads/streets | ▪ Decreased life span of roads and sidewalks from increased freeze-thaw cycles, and increased amount of salt and de-icers used.<br>▪ Increased need for dust control during drought or winter inversions |
| Invasive Plant Management | ▪ Increased demands for invasive plant management services due to increased spread of invasive species |
| Economic Development | ▪ Increased need for economic development to capitalize in the positive aspects of a changing climate (e.g., agricultural opportunities due to longer growing seasons, agricultural composting business opportunities, recreation-related opportunities with shorter winters/longer summers, bioenergy, etc.) |
| Water | ▪ Decreased water supply in late summer as a result of earlier spring freshet<br>▪ Cumulative effects of upstream activities and changes in hydrology will be exacerbated, and continue to affect downstream municipal water supply<br>▪ Local interaction between surface water and groundwater systems<br>▪ Increase in treatment costs to supply water when quality has decreased |
| Sewer | ▪ Shallow sewer systems or those in proximity to natural features may cause concern |
| Storm water | ▪ Increase in spring freshet volume will strain capacity of storm water systems causing local flooding, and potentially damage the infrastructure<br>▪ Decreased life span of storm water systems from increased amount of salt and de-icers used on roads |
| Protective/emergency services (fire protection, search and rescue, 911 telephone) | ▪ Increased demand on emergency management services and related social services as a result of increased frequency and intensity of forest fires, spring floods, landslides in unstable areas and avalanches<br>▪ Increased training demands to increase emergency response capacity in local government or volunteers |
| Police | ▪ Increased demand for police in rural areas during forest fires, spring floods and emergency events to enforce evacuations and provide communication and safety to residents |
| Parks | ▪ Increased management needed due to pressures from invasive plants, flooding, longer recreation season, and impacts on park infrastructure |
| Solid waste management | ▪ Increased demand for management of woody debris as a result of interface fire treatments, and invasive plant management |
| Communications | ▪ Increased demand on communication services as a result of increased frequency and intensity of forest fires, spring floods |
| Health Services | ▪ Increased frequency and intensity of respiratory issues due to poor air quality during forest fires or prolonged drought/dusty conditions in summer or during winter inversions<br>▪ Increased summer temperature will lead to increased incidence of heat stroke<br>▪ Introduction of new diseases such as West Nile virus |

## Opportunities to address a changing climate in the RDS

The following matters to be included in the RDS were deemed most relevant to climate change adaptation. See the strategy for recommendations to address each of the opportunities.

| Matter for RDS to consider | Opportunity to address a changing climate |
|---|---|
| 1. avoiding **urban sprawl** | ▪ Limit urban growth to areas where existing services are already in place |
| 2. **settlement patterns** | ▪ Densification of downtown areas to reduce reliance on automobiles, establishment of bike trails for commuting |
| 3. the efficient **movement of goods and people** | ▪ Minimize road and other infrastructure development and maintenance costs by utilizing existing transportation corridors |
| 4. protecting **environmentally sensitive areas** | ▪ Restoration and/or protection of degraded ecosystems, in particular those that impact water |
| 5. maintaining a **secure and productive resource base** | ▪ Agricultural and forest specific issues<br>▪ Policies and bylaws, direct involvement through management of community forests and other tenures |
| 6. **economic development** | ▪ Support existing economic sectors such as forestry, ranching, mining and tourism in the future climate scenarios<br>▪ Identify new and emerging economic sectors that are appropriate with the future climate scenarios<br>▪ Agricultural diversification and processing opportunities<br>▪ Cultural heritage, trail development |
| 7. reducing and preventing air, land and water **pollution**; | ▪ Airshed management planning, scrubbers on emissions<br>▪ Small scale settlement and development planning |
| 9. suitable land and resources for **future settlement** | ▪ Ensuring future settlement areas are located where the land is suitable (i.e., not ALR) and sufficient water resources exist<br>▪ Address limits to development given natural resources |
| 10. protecting **ground water and surface water** | ▪ Point-sources of contamination<br>▪ Storm water management systems<br>▪ Improvement districts and private water systems<br>▪ Mapping of aquifers and assessment of groundwater – surface water interactions |
| 11. minimizing the risks associated with **natural hazards**; | ▪ Assessments of new settlement areas for natural hazard risks (i.e., landslides, erosion, flooding, interface fire) |
| 13. planning for **energy supply** | ▪ Develop shared heating/cooling that recaptures lost energy or is based on renewable sources<br>▪ Bioenergy and geothermal potential |
| 14. land, sites and structures with **cultural heritage** value | ▪ Protect land, sites and structures from natural hazards<br>▪ Learn how early pioneers adapted to the climate in the past<br>▪ Economic development potential |
| 15. **tax base and revenue sources** | ▪ Stable tax bases and revenue sources are required to replace the anticipated downturn in the forest industry<br>▪ This strategy could provide the basis for a funding request from federal or provincial government |
| 16. intergovernmental **efficiency of service delivery** | ▪ Significantly reduced local government revenue sources as a result of a decreased tax base could lead to forced sharing of services, or a reduction in the kinds of services provided |
| 17. addressing **natural hazards affecting existing settlements** | ▪ Long term plans to move existing settlements away from known natural hazard areas based on level of risk (i.e., Green Acres trailer park in Williams Lake, West Quesnel land instability, Cottonwood River erosion)<br>▪ Restoration, remediation or mitigation of natural hazards |

**For more information**
Mike Simpson, email msimpson@fraserbasin.bc.ca tel 250-392-1400
Web www.fraserbasin.bc.ca | www.retooling.ca | www.toolkit.ca