Cariboo-Chilcotin: Climate change analysis

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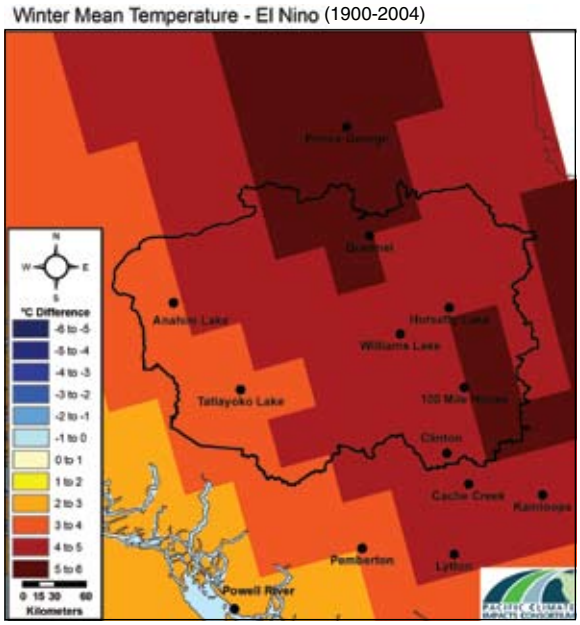
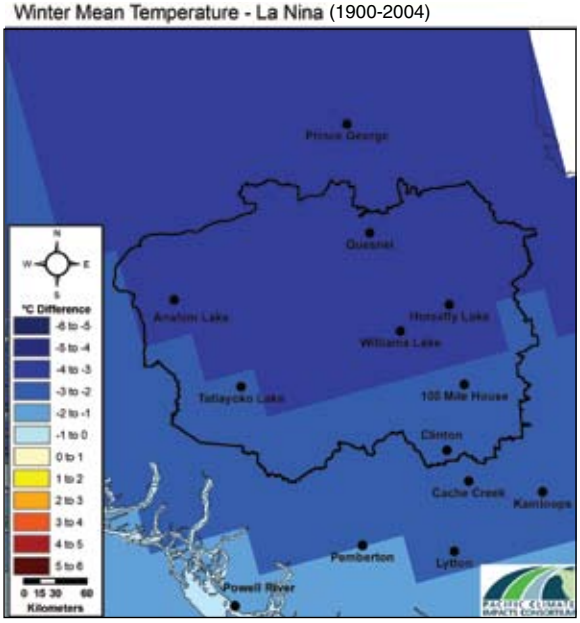
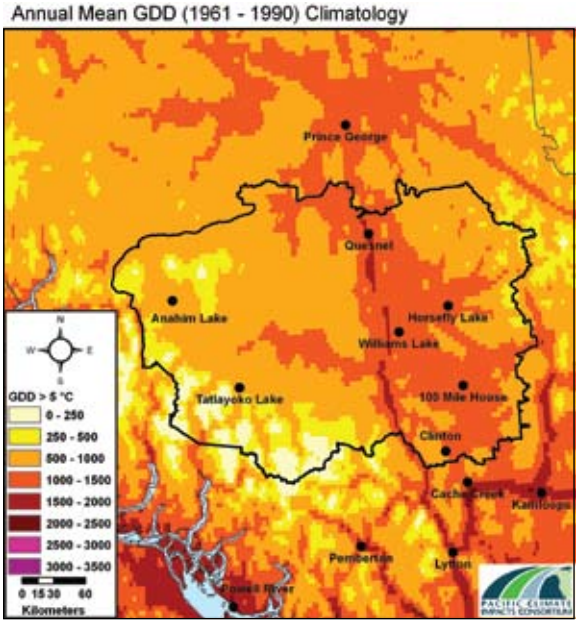
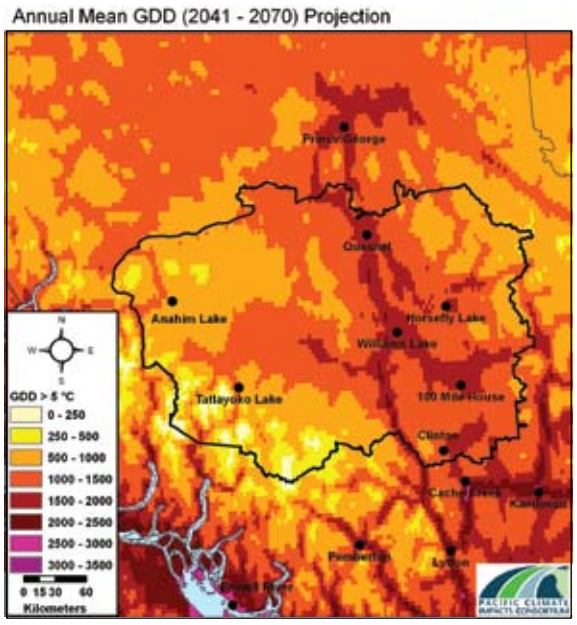
A preliminary analysis of climate change in the Cariboo-Chilcotin is recommending future work to assess potential vulnerabilities and opportunities from climate change for area ecosystems and resource values. The report was a collaboration between the provincial government's Integrated Land Management Bureau and the Pacific Climate Impacts Consortium from the University of Victoria. It indicates that such assessments could help researchers and planners develop specific adaptation responses to minimize disruption to important ecological, economic, and social values in the Cariboo-Chilcotin.

This 50-page report provides analysis of past and potential future climate in the Cariboo-Chilcotin region in the Central Interior of British Columbia. It was written to stimulate thought, discussion, and planning about the effects of climate change on the ecosystems and resource values included in the Cariboo-Chilcotin Land Use Plan.









suggests future work needed to assess vulnerabilities

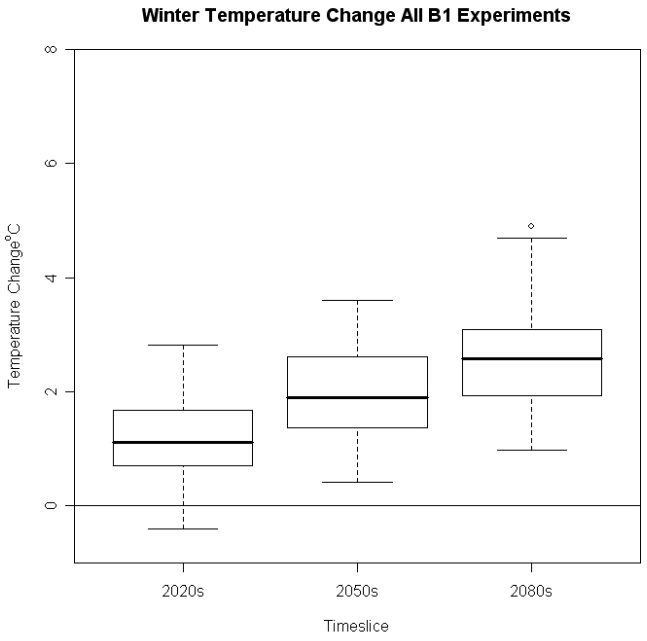
Background information on climate science and natural climatic cycles, including the El Niño Southern Oscillation and the Pacific Decadal Oscillation, is provided, along with an extensive set of up-to-date literature and web-based references. This article offers a few highlights from the report.

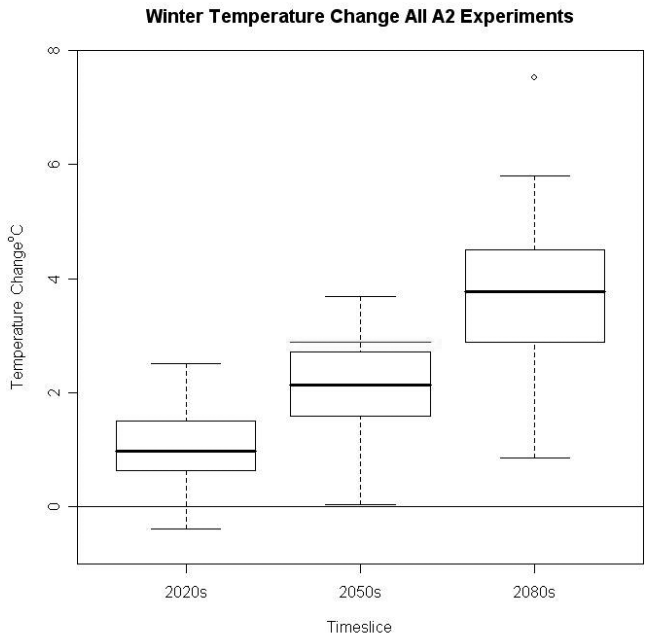
The Quesnel weather station provides the longest continuous historical climate record within the Cariboo-Chilcotin area. In Quesnel, the mean annual temperature warmed at a rate of 0.9°C/century over the period from 1895 to 2005 and 3.2°C/century over the shorter recent period from 1950 to 2001. Winter minimum temperatures warmed even faster. Mean January overnight minimum temperatures increased at a rate equivalent to 15.1°C/century for the 1950 to 2001 period.

Despite these warming trends, temperatures vary greatly between years. One of the major sources of year-to-year variability is "ENSO"—the El Niño Southern Oscillation. Compared to the long-term average, Cariboo-Chilcotin winter temperatures were 3 to 6°C warmer during El Niño years and 1 to 3°C cooler during La Niña years for the period from 1900–2004 (see left).

Projections of future climate scenarios for the Cariboo-Chilcotin are presented in the form of graphs and maps. Maps comparing projected future climate with a 1960 to 1991 baseline were developed using two different methods. The first method, regional climate modelling, refines global climate model output to account for regional characteristics such as topography and elevation using smaller grid squares. The second method, empirical downscaling, (shown left) uses elevation, aspect, and historical climatology to adjust global climate model output to portray the spatial distribution of climate. The pair of maps on the left compares growing degree-days for 1961 to 1990 with the projected growing degree-days from one downscaled climate model for 2041 to 2071.

The graphs featured on the right summarize the results from multiple runs of 15 different global climate models each applied to a low (B1) and high (A2) greenhouse gas emissions scenario. For both emission scenarios, the median for projected winter temperature steadily warms from the 2020s to 2080s. Together, the graphs and maps provide a more complete picture of potential future climate, modelling uncertainty, and spatial distribution of projected changes.





The temperature changes shown in both the historical data and in future projections have important implications for managing watersheds and ecosystems for agriculture, forestry, fisheries, wildlife, and biodiversity.

The report can be downloaded from the Pacific Climate Impacts Consortium website at: ***http://www.pacificclimate.org/docs/publications/CaribooChilcotinClimate.08Sept08.pdf***