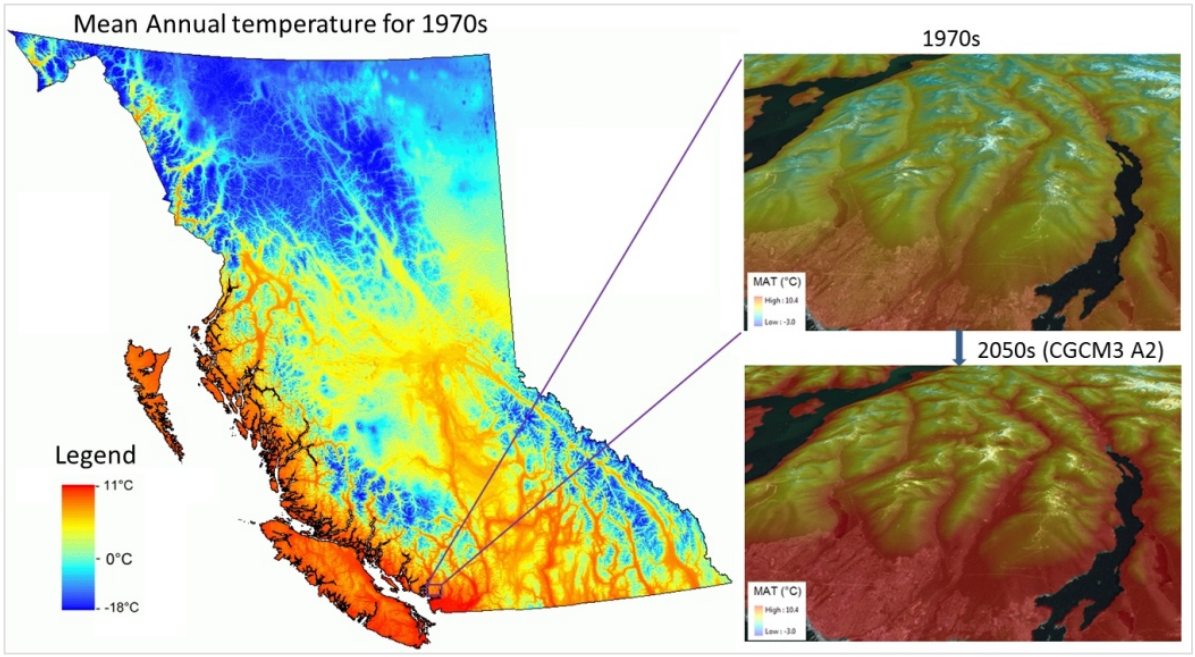
ClimateBC; modeling climates in BC forest ecosystems

Ecosystems in BC develop primarily in response to climate. Climate is defined using long-term meteorological data such as mean annual temperature, growing season precipitation, and a host of other measured or calculated variables. The problem facing researchers trying to better understand ecosystem and tree growth response to climate is that there are relatively few meteorological stations across BC and there are rarely any long-term data available for specific ecosystem locations. Faced with this problem when beginning to reanalyze components of the Illingworth lodgepole pine provenance trials, Dr. Tongli Wang and Dr. Andreas Hamann, then both working in the UBC Center for Forest Conservation Genetics (CFCG), used existing techniques to interpolate meteorological data to specific provenance and test site locations without weather stations. As their work progressed, they recognized the value of having a user-friendly model available for a broad range of applications, including better understanding climate-change impacts on forest ecosystems.

Initially funded through an NSERC Strategic Grant, the modeling work started by Wang (UBC) and Hamann (now at the University of Alberta) quickly expanded and was refined to become the ClimateBC model. Other researchers contributed to its development, including Dr. Dave Spittlehouse from the FLNRO and Dr. Sally Aitken, UBC professor and CFCG Director. With additional funding support through the FGC and other organizations over a period of some 8 years, the ClimateBC model was improved and refined to provide accurate estimates for a large number of climate variables, including biologically-relevant variables, at any point in BC. These estimates can be derived for past years, and well into the future, and provide the climate database for modeling BC forest ecosystems and tree species range. The now well known “flying BEC zone” maps are one of the applications supported by ClimateBC.



The forecasts of ecosystem change were initially used to predict climate envelopes suitable for populations of native tree species to better understand seed transfer for operational planting. It was also used to assist with genetic conservation cataloguing. The value of the model has since been widely recognized and is used in an increasing number of applications, including forecasting species range changes with climate change, expected future fire risk scenarios, wildlife habitat, and a range of forest management implications. The ClimateBC model, developed with substantial funding through the FGC and the Future Forest Ecosystem Science Council, has now been expanded to include all of western North America (ClimateWNA) and its application is being extended to other parts of the world. More information on the ClimateBC/WNA models are on the CFCG website at http://www.genetics.forestry.ubc.ca/cfcg/climate-models.html

Author: *Jack Woods. This article originally appeared in the FGC Annual Report 2011/12.*