Spatial climate data to aid adaptation to climate change in resource management

Version 5.3 of the ClimateBC spatial climate data software was recently released along with versions of ClimateWNA and ClimateNA. ClimateBC covers British Columbia, ClimateWNA covers North America west of 100°W longitude, and ClimateNA covers all of Canada, USA and Mexico. They are available as stand-alone software for use on a desk-top computer and as web-based versions. These applications provide easy access to historical climate data and projections of future climate change at scales meaningful for climate change risk assessments and research applications. Earlier versions have been used by academia, government, industry and consultants in forestry, agriculture, hydrology, land use planning and engineering.

The software provides monthly temperature and precipitation data and a large number of derived variables such as degree days, frost free period, evaporative demand and climatic moisture deficit for individual or multiple locations. The historical data cover 1901 to 2014. Projections of future climate for the 2020s, 2050s and 2080s periods are from the Intergovernmental Panel on Climate Change's 5th Assessment for 15 global climate models (GCM) and emission scenarios RCP 2.6, 4.5 and 8.5.

The recent improvements to the software include:

- Climate data for historical years updated and extended to 2014.
- Monthly paleoclimate data for three periods from GCM simulations
- Users can choose multiple scenarios and time periods in a single run
- Time series of monthly projections for years of 2011-2100 for RCP 4.5 and 8.5 of six GCMs
- Ability for the user to add new time series projections as they become available

The software can be downloaded from:

- ClimateBC - http://climatemodels.forestry.ubc.ca/climatebc/downloads/ClimateBC_v530.zip
- ClimateWNA - http://climatemodels.forestry.ubc.ca/climatewna/downloads/Climatewna_v530.zip
- ClimateNA - http://climatemodels.forestry.ubc.ca/climatena/downloads/ClimateNA_v530.zip

ClimateBC Map and ClimateNA Map are web-based versions of the application for those who do not need the full power of the standalone version. They are integrated to Google Maps to allow users to obtain the coordinates and elevation for the location of interest simply by clicking at a location on the map. The users then click on the "Calculate" button to get all climate variables for a selected period. The output can be saved on a local computer. The map versions can be accessed at:

- ClimateBC - www.climatewna.com/ClimateBC_Map.aspx/
- ClimateNA – www.climatewna.com/climatena_map

Gridded raster data layers are available for the entire North American continent at the spatial resolution of 1x1 km for the normal periods 1961–1990 and 1981–2010, and three future periods 2020s, 2050s and 2080s for 8 selected CMIP5 models and two greenhouse gas emission scenarios (rcp 4.5 and 8.5). The datasets are available at: http://tinyurl.com/ClimateNA and https://adaptwest.databasin.org/ .The variables can also be displayed graphically, as summarized by watershed across North America, using an interactive online data viewer at the AdaptWest web site.

A recent journal article describing the software and its evaluation is available at http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0156720

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