



## **Glacier and hydrology changes in future climate over western Canada**

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Glaciers are frozen fresh water reservoirs that respond to changes in temperature and snowfall. Concern is growing about the impact that changes in glaciers may have on water resources in regions such as western Canada that derive a lot of their summer streamflow from glacier melt. Given that RCM projections are an important tool and are increasingly being used in assessing projected changes to water resources, particularly due to its high resolution compared with GCMs, realistic representation of glaciers in RCMs is very important. Currently, glaciers are only represented in an extremely simplified way in the fifth generation Canadian Regional Climate Model (CRCM5). This simple approach of representing glaciers as static glacier masks is appropriate for short-term integrations, where the response of glacier to changing atmospheric conditions might still be small due to glacier response times and therefore the feedback of changing glacier extent on large-scale atmospheric flow conditions might be negligible. A new dynamic glacier scheme has been developed for use within CRCM5, based on volume-area relationships. Simulations have been performed with this glacier model and Land Surface Scheme CLASS for the 2000–2100 period over a domain covering western Canada. These simulations were driven by outputs from a CRCM5 transient climate change simulation driven by CanESM2 at the lateral boundaries, for RCPs 4.5 and 8.5. Preliminary results suggest significant decreases to glacier fractions in future climate. Though the glacier contribution to streamflows is found to dramatically decrease in future climate, the total streamflows did not show any dramatic decreases due to the increase in precipitation for these regions.