



Remotely-sensed Western Canadian Glacier Inventory 1985-2005 and regional Glacier Recession Rates

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We report on a recently completed glacier inventory for the Canadian Cordillera south of 60 °N - a region that contains ~30,000 km² of glacierized terrain. Our semi-automated method extracted glacier extents from the Landsat Thematic Mapper (TM) and ASTER scenes obtained in 2005 and 2000, while the BC Government provided digital data of ice cover from 1985 obtained from high-altitude, aerial photography. We produced glacier vectors from the satellite imagery using a band ratio image (TM3/TM5) and the ice vectors from 1985 as a mask. Indices of water, vegetation, and slope identified misclassified pixels. We manually checked glacier polygons for gross errors and identified debris-covered ice with a 25 m digital elevation model (DEM). The DEM also enabled us to split the glaciers into their respective flowsheds. The derived ice extents and those obtained by manual digitization differed by 2.5%. Glaciers in British Columbia lost about 12.5% of their area over the period 1985-2005. The annual retreat rate 0.6% a⁻¹ is comparable to rates reported in other mountain ranges in the late twentieth century. Least glacierized mountain ranges lost the largest fraction of ice cover. Highest ice loss (30%) occurred in the Northern Interior Ranges, while glaciers in the Northern Coast Mountains retreated least (6-7%). The Southern Rocky Mountains lost about 17% of their glacierized area since the 1980s. The retreat rates between 2000 and 2005 in the Interior Ranges and Rocky Mountains are higher than in the Coast Mountains, and are the highest in the Northern Rocky Mountains. Work is underway to examine the relation between glacier recession and climatic variability over the period 1985-2005.