



## **Vancouver 2010 Winter Olympics Land Surface Forecast System**

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Environment Canada's land surface forecast system developed for the Vancouver 2010 Winter Olympics is presented together with an evaluation of its performance for winters 2007-2008 and 2008-2009. The motivation for this work is threefold: it is i) application driven for the 2010 Vancouver Olympics, ii) a testbed for the panCanadian operational land surface forecast model being developed, and iii) the precursor to the fully coupled land-surface model to come. The new high resolution (100m grid size), 2D, and novel imbedded point-based land surface forecast model used to predict hourly snow and surface temperature conditions at Olympic and Paralympic Competition Sites are described. The surface systems are driven by atmospheric forcing provided by the center's operational regional forecast model for the first 48 hours and by the operational global forecast model for hours 49 to 96. The forcing fields are corrected for elevation discrepancies over the rapidly changing and complex mountainous settings of the Vancouver Olympics that arise from resolution differences. Daily 96h land surface forecasts for 2 winters and snow depth and surface air temperature observations collected at several specially deployed competition sites are used to validate the land surface model. We show that the newly implemented surface forecast model refines and improves snow depth and surface temperature forecast issued by the operational weather forecast system throughout the forecast period.