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RESEARCH COLLOQUIUM SERIES

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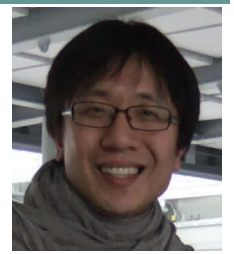

THE CHANGING HYDROLOGICAL REGIME OF THE FRASER RIVER BASIN

A macro scale surface hydrology model, the Variable Infiltration Capacity (VIC) model, was applied to the Fraser River Basin (FRB) of BC to detect past changes in the watershed's hydrological regime. Previous modeling studies have demonstrated that the FRB is a snow-dominated watershed but with climate change may evolve to a pluvial regime. A previous analysis of streamflow covering a century showed increasing variability in inter-annual flows across the FRB. This application of the VIC model evaluates the changing contribution of snowmelt to the hydrology of the FRB both spatially and temporally. To this end, a 3-hourly meteorological forcing dataset was used to drive the VIC model for 54 years (1953 to 2006). The FRB is then divided into 7 sub-basins and the simulated discharge is validated with stream gauge observations operated by the Water Survey of Canada (WSC). There will then be a focus on the contribution of snowmelt to the total discharge estimated from spatially-averaged maximum snow water equivalent (SWE) divided by annual runoff (Q) over the hydrological years. High values of this ratio indicate that the upper FRB experienced deep wintertime snowpacks followed by high freshets during May and June in the 1990's. On the other hand, the summer season was dry compared with 1960's to 1980's. In addition, simulations by perturbed forcings of precipitation and air temperature suggest that the maximum SWE/Q ratio is more sensitive to air temperature rather than precipitation. The talk will then end with a discussion of microwave remote sensing of snow and its potential utility in assessing the changing FRB.

Friday

Oct. 5, 2012

3:30 - 4:30

LECTURE THEATRE

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