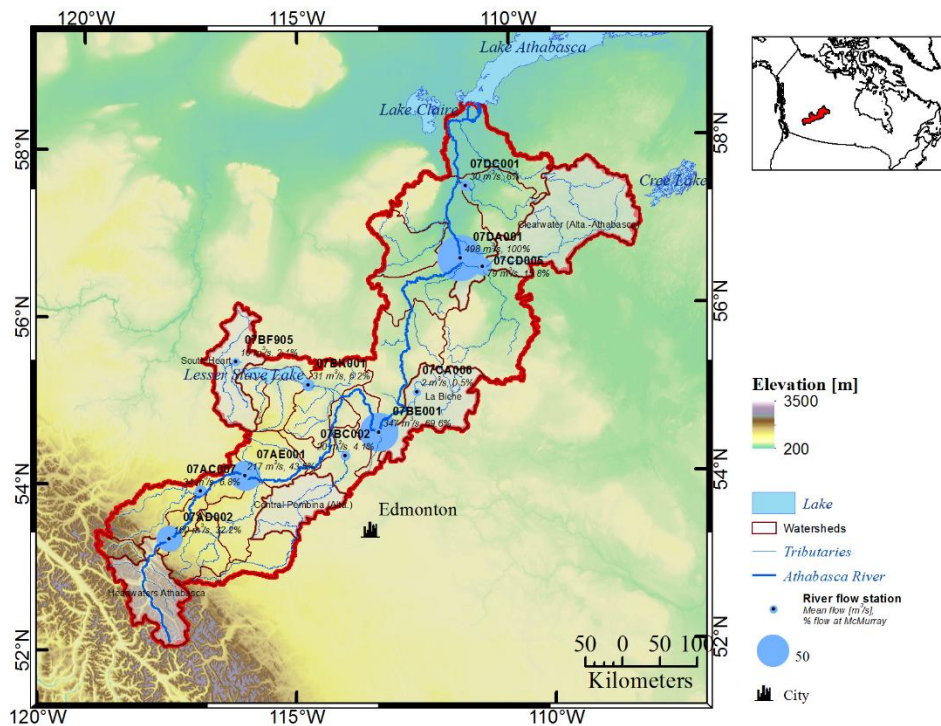


Snow cover dynamics and hydrological modelling using MODIS snow products in the Athabasca catchment, Alberta, Canada

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Abstract: The Athabasca River Basin is a watershed of primary importance to the province of Alberta and its developing Oil Sands industry. In addition, it contains major conservation areas, including the Athabasca Delta, a wetland region of world significance. Originating in the high Canadian Rocky Mountains, the great bulk of annual river flow comes from the spring melt of snow cover. In order to understand better the amount and timing of release of snow melt from the basin, this study first assembles an eleven-year time series for the period 2001 to 2011 of snow-cover extent in the Athabasca River basin based on MODIS MOD10 8-day composite snow product. This leads to establishment of snow cover chronologies that define key stages of its accumulation and melt. This study then examines the practicality of applying both MODIS satellite imagery and a fully distributed implementation of Martinec Snowmelt Runoff Model (SRM) to the headwaters of the Athabasca Basin. Results indicate that the combination of satellite derived snow cover information, available climate data and the SRM perform very well in simulating snowmelt and runoff in the Basin, despite the fact it uses simple and limited parametrization. Results show that more than half of the variations in streamflow at Hinton can be explained by variations in seasonal snowmelt. Performance of the data acquisition and modelling platform deteriorated markedly after 2007 due to a sudden decline in available climate data after that date.

12:00 noon, Thursday, 21 July 2016

L1 Lecture Theatre
School of Surveying
310 Castle Street