**Project proposal: Improving predictions of snowmelt runoff in flood forecasting models**

**Abstract**

Partitioning of snowmelt between infiltration and runoff is a critical hydrological process in seasonally frozen environments, and is especially important for forecast models that predict flooding. Frozen soils have complex physical properties and processes are still not well understood. A good model should be able to simulate the physical processes in a realistic manner, while also producing simulations of streamflow that are consistent with observations. In this project we will test alternative models for infiltration into frozen soils. We will use field observations from the Canadian prairies to test the performance of the different models. The objective is to inform how Environment and Climate Change Canada can improve their streamflow simulations in the snowmelt period.

**Overview of methods**:

* We will identify one or more field sites in Saskatchewan. Options include St Denis and Clavet. Andrew will provide field data (soil moisture, soil temperature, meteorological data including precipitation, snow surveys).
* We will apply the DRUtES model to the site. We will also apply Andrew’s openRE model and possibly the Canadian Land Surface Model.
* We will focus on what happens in each model during the snowmelt period.

**Project pre-requisite skills**:

* Python for data analysis and modelling
* Git for sharing models/data
* Some readings will be provided