ABSTRACT

A quick hydrological screening tool to assess the impact of landscape changes on streamflow regime
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Recent development of hydrological models focused on complex representations of the landscape and hydrological processes, in particular above surface processes. Some of these representations have been incorporated in physically based energy balance models to simulate snow pack processes and evaporation in forested watersheds. However, physically based models have some disadvantages: They require a number of meteorological input variables. Often an unknown amount of uncertainty is introduced to physically based model predictions when expensive or difficult to measure variables are approximated by other variables such as air temperature. Physically based models require lots, sometimes hundreds of parameters, which makes model calibration challenging and time consuming. The generally long run times of physically based models also impedes sensitivity analysis and the calculation of prediction uncertainties, both of which are important instruments when transporting scientific knowledge to policy makers.

This study presents the initial stages in the design of YAM (i.e., Yet Another Model), a simple modelling platform to model the impact of landscape changes on streamflow with minimum input data requirements. Preliminary test results are given for the Cotton Creek experimental watershed, a snow dominated watershed in South-Eastern British Columbia. YAM predictions of spatial snow processes, nested streamflow, and flood frequency distributions are compared to predictions of DHSVM, a physically based hydrological model.