



A real time debris flow forecasting system for North Vancouver, British Columbia

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This paper details the scientific basis and results for the development of a real-time operational hydro-meteorological debris flow warning system for the North Shore Mountains of Vancouver. The main component of the warning system is a multivariate statistical model that demonstrates that the 4 week antecedent rainfall, the two day antecedent rainfall and the 48 hour storm rainfall intensity explain if a given storm will result in a debris flow or not. Discriminant functions were developed that allow real-time calculation of discriminant scores and thus the relative likelihood of a storm resulting in shallow landslides. A 48 hour forecast of spatially distributed rainfall on the North Shore Mountains is made through a high resolution climatic model generated by the Geophysical Disaster Computational Fluid Dynamic Centre at the University of British Columbia. This step is an integral part in predicting threshold exceedence well before debris flows would likely occur and thus allowing sufficient time to provide warning. The system would have two levels of warning. The first is based on a lower threshold exceedences and is called 'Debris Flow Watch'. The second would be based on a higher threshold and is called 'Debris Flow Warning'. There will be at least several hours time to react to those exceedences before shallow landsliding is likely to occur.