“Channel scour on temperate alluvial fans in British Columbia”

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Morphometric controls on channel scour depth on temperate fans in British Columbia, Canada were studied. Predictive multivariate equations were developed from scour measurements and morphometric variables from a dataset of 116 fans. Stepwise regression and multimodel inference approaches were used to rank the importance of each morphometric variable and to develop the final predictive models. Watershed area, fan gradient, and fan relief were identified as the most important variables that allowed prediction of channel scour. These predicted values explained approximately half of the variance in the observed scour measurements, with the largest deviations observed at higher values. A case study of a debris flow event at Neff Creek demonstrated that intense fan scour can amplify the final deposit volume and cause significant damage on the distal fan. The results of this research can be used to prioritize scour hazard assessments for infrastructure development on fans.