



Fluvial censoring and sediment reworking of rock-avalanche deposits on the New Zealand South Island: Field and laboratory studies

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Rock-avalanche (RA) censoring processes such as occlusion in lakes, vegetation cover and sequestration into glaciers have received research attention in recent years. This research indicates the extent to which these extremely large and potentially hazardous landslides can be hidden from our sedimentological records. Here we examine the process of fluvial censoring of RA material to see how they can be removed from the sedimentary record. Two approaches were used to examine these processes, (1) Agglomerates, microscopic grains that are diagnostic of RA sediment, were identified in known RA deposits and then traced in fluvially reworked sediment to examine the redistribution of fine-grained source material. (2) Micro-scale flume modelling, using ultra-violet sand as an analogue for RA dams, was conducted to examine the redistribution of coarse-grained material in an idealised laboratory based river system.

The results show that the agglomerate signal was detected in RA-proximal flood deposits but the signal rapidly deteriorated downstream. Flume modelling shows that most of the material from RA dams is stored in dam-proximal locations and eventually buried by normal fluvial sediment flux. Some dam material was transported downstream to be deposited in model valley confined flats, braidplains or washed out of the model (simulating pelagic or lacustrine deposition). This indicates that archives of fluvially reworked RA material could be stored within valley confined flats, lakes and ocean sediment.