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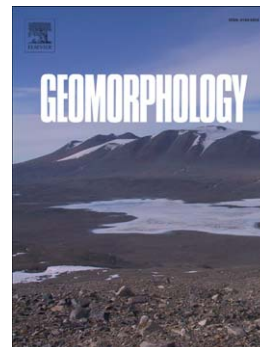
Effects of check dams on bed-load transport and steep-slope stream morphodynamics

Guillaume Piton, Alain Recking

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# **Effects of check dams on bed-load transport and steep-slope stream morphodynamics**

Guillaume PITON<sup>1</sup>, Alain RECKING<sup>2</sup>

<sup>1</sup> PhD student, Université Grenoble Alpes, Irstea, UR ETGR, 2 rue de la Papeterie-BP 76, F-38402 St-Martin-d'Hères, France, Corresponding author: guillaume.piton@irstea.fr

<sup>2</sup> Researcher, Université Grenoble Alpes, Irstea, UR ETGR, 2 rue de la Papeterie-BP 76, F-38402 St-Martin-d'Hères, France, alain.recking@irstea.fr

## **0 Abstract**

Check dams are transversal structures built across morphologically-active streams in mountainous regions. These structures have been used widely in torrent-hazard mitigation for over 150 years. Thousands of them are regularly maintained by stream managers and torrent-control services. The stabilization role of these structures is well known, i.e. they durably constrain the stream-bed through the creation of vertical and planar fixed points. What is not yet clear is to what extent check dams influence bed-load transport: How do peak solid discharge or flood-transported volume change when check dams are added to a reach? To address these questions, long-lasting small-scale experiments were conducted in a 4.8-m-long flume with either one, three or no structures. The results show that the addition of structures create independent compartments in the bed level, which have a strong influence on bed surface armouring and stream morphodynamics: the consequence is that instantaneous transport intensities are unchanged, but peak solid discharge occur more often and for shorter duration. This results in the same total transported volume over the long term, but reduced volume for a single transport event. It reaffirms the observation of pioneering authors of the mid-19<sup>th</sup> and early 20<sup>th</sup> century who conceptualized the possible sediment transport regulation function of check dams: in addition to stabilizing the stream-bed, check dams influence bed-

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