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## Effect of stress history on sediment transport and channel adjustment in graded gravel-bed rivers

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Recently, there has been an increasing attention on the environmental flow management for the maintenance of habitat diversity and ecosystem health of mountain gravel-bed rivers. More specifically, much interest has been paid to how inter-flood low flow can affect gravel-bed river morphodynamics during subsequent flood events. Such an effect is often termed as “stress history” effect. Previous research has found that antecedent conditioning flow can lead to an increase in the critical shear stress and a reduction in sediment transport rate during a subsequent flood. But how long this effect can last during the flood event has not been fully discussed. In this study, a series of flume experiments with various durations of conditioning flow are presented to study this problem. Results show that channel morphology adjusts significantly within the first 15 minutes of the conditioning flow, but becomes rather stable during the remainder of the conditioning flow. The implementation of conditioning flow can indeed lead to a reduction of sediment transport rate during the subsequent hydrograph, but such effect is limited only within a relatively short time at the beginning of the hydrograph. This indicates that bed reorganization during the conditioning phase, which induce the stress history effect, is likely to be erased with increasing intensity of flow and sediment transport during the subsequent flood event.