

## **An update of the magnitude–frequency analysis of Rio Cordon (Italy) bedload data after 25 years of monitoring**

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**Abstract** Quantification of bedload transport in high-gradient mountain streams is important, but field data necessary to test transport models are scarce. In the present work, we describe the experimental station for monitoring water and sediment fluxes built in 1985 on the Rio Cordon (Eastern Italian Alps), a small step-pool channel. The measuring station consists of an inclined frame that separates (at 20 mm truncation) fine and coarse sediments, which are continuously measured for accumulations by two turbidimeters. The 25-year dataset acquired, which comprises high-magnitude/low-recurrence flood events, has allowed a magnitude–frequency analysis of bedload volumes. Results from a combined frequency analysis of peak water discharge and total bedload volumes based on the 25 events are presented, focusing on discrepancies between recurrence intervals of peak discharge and bedload volume for each event. In addition, the integration between the sediment transport dataset and the repeated surveys of sediment sources and of channel changes has permitted to assess the geomorphic effectiveness of different flood events. The Rio Cordon measuring facilities have provided excellent data and valuable insights into the bedload dynamics of steep streams throughout its 25 years of operation, thanks to the close collaboration between the ARPAV-Veneto Region and the Department Land and Agro-forest Environments (University of Padova). However, the maintenance costs of the station are not trivial and may impact its future “vitality”. At the same time, improvement of the present instrumentation and installation of novel technology would make the station an ideal location for calibrating surrogate techniques for sediment transport monitoring.

**Key words** bedload; steep channels; sediment supply; frequency analysis; step pool; alpine torrents