Geomorphological estimation of debris-flow volumes in alpine basins

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Abstract

The estimation of debris flow volumes is a basic requirement for the assessment of debris flow hazard and for the design of torrent control works. Geomorphological methods for the estimation of debris flow volume are based on the recognition of sediment sources located along the channel network. The paper discusses the use of these methods in alpine basins and provides an example of application to a basin in the Dolomites (Northeastern Italy). A detailed inventory of sediment sources was set up through field surveys, and mobilisable debris volumes were estimated taking into account local topography and the characteristics of erosion and instability phenomena. A check of debris volumes resulting from field surveys was carried out, testing their consistency with storm runoff volumes estimated through a rainfall-runoff transformation. The paper presents some guidelines for the application of geomorphological methods for the estimation of debris flow volumes in alpine basins.

Keywords: debris flow, volume, sediment sources, field surveys, geomorphology

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