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# Field surveys and GIS techniques for channel network identification

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The study is oriented both to channel network identification and to the distinction between hillslope, colluvial and alluvial reaches. A field research was carried out in an alpine basin of Dolomitic Region, characterized, at the upper part, by a developed ephemeral colluvial network and by a main channel dominated by rapids and step pools.

Measurements were carried out along the upper Cordevole river. Geometric (channel width and depth at bankfull stage), morphometric (channel slope $S$) and hydrologic (water discharge) parameters were measured in the main channel and in five colluvial reaches at head of the basin.

The investigation is focused on the relationships between the morphological parameters of headwater channels and some variables as contributing drainage area and *stream power* ($\Omega$p, concerning to colluvial and alluvial reaches. The basic object of the study regards the transition from colluvial to alluvial reaches and the analysis of those variables which can play a primary role on the identification of the morhodynamics attitudes of the channel network.

The stream power, which expresses the rate of stream potential energy losses per channel length unity, has proved to be consistent for representing the threshold conditions from the colluvial to the alluvial morphologies; it could be used to determinate the *threshold* value between the two channel typologies. According to this aspect, an evident separation between colluvial reaches and alluvial morphologies was found. At the same slope ($S$) values, the colluvial reaches develop in correspondence of stream power values lower than those of the alluvial channel. Basin hillslopes, are characterized by $\Omega$ values lower than 13 W/m (50 W/m in the case of high slopes).

Even considering, as threshold parameter, the simple water discharge at the bankfull stage ($Q_{bk}$), separation between hillslope, colluvial reaches and alluvial net gives satisfactory results.

The validation of threshold $\Omega$gnd $Q$ values was conducted, at basin scale, through geographic information system (*GIS*) techniques, by which the hydrographic network can be broken out into colluvial and alluvial reaches.