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Morphodynamics of debris flow-dominated channels

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The mountain environment is mainly shaped by mass movements and glacial, debris flow and fluvial erosion. Therefore the landform ensemble of torrential catchments includes features of several thousand years. Many of them contribute as debris sources to the development of debris flow activity. But the torrential channel is not formed by different types of slope failures only, channel erosion itself plays a dominant role in the development of debris flows.
Today LIDAR data allow us to identify different types of debris sources and subsequent channel features. In combination with the lithological setting this information helps us to understand the general morphodynamics of mountain channels. A deeper insight into the development of mountain channels lacks of consistent data sets. Different approaches try to estimate erosional rates of torrents during design events. These methods are mainly based on field survey and on the experience of the person doing this job. To decrease the uncertainty of these data, the collected data have to be checked against already existing data of documented former events. The development of the erosional processes in torrents is directly linked with the dominating morphodynamic process, leading to essential estimates of debris flow hydrographes.