

## Unravelling erosion and deposition by debris flows in the Illgraben (CH)

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### Project description

Debris flows are masses of soil, rock and water that rush down mountainsides and spill onto valley floors, where they can devastate people and property. The number of casualties and the amount of damage caused by a debris flow depends on its volume. Flow volume depends on how much sediment is entrained while flow traverses from mountainside to valley. Unfortunately, prediction of debris-flow volume, and thus hazard mitigation, is currently hampered by our limited understanding of the processes of debris-flow erosion and deposition.

To increase our understanding of debris-flow erosion and deposition, you will analyze where and when erosion and deposition occur in the Illgraben torrent in the southwestern Swiss Alps. There is a long history of debris flows in the Illgraben torrent, with multiple debris flows and debris floods each year which are triggered by intense rainfall during summer storms between May and October. Between 2018 and 2021, we have used drones to obtain [high-resolution elevation datasets of the channel bed](#). This dataset can be used to unravel the spatio-temporal patterns of erosion and deposition, to decipher how and under which conditions debris flows grow in size and hazardous potential. This analysis will be substantially aided by measurements of the flow characteristics, such as total volume, flow velocity, flow depth, and normal and shear force fluctuations collected by the [Swiss Federal Institute for Forest Snow and Landscape Research \(WSL\)](#), with whom you will collaborate.

Analysis of the spatial patterns of erosion and deposition is done with ArcMap. Correlations with flow characteristics can be done with a program of choice (e.g., Matlab, Python, Excel, R). The work is desktop based and will therefore not be affected by COVID-19 related measures.

### Job requirements

Interest in landslides, natural hazards, and GIS.