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# Determination of mobilised volume material by a mud flow in the Glaive forest (SW Switzerland) using a high resolution DEM

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The Glaive forest above Ollon in SW Switzerland is affected by a large landslide (600 x 400 meters, mean slope 45o). It is probably caused by the retreat of the alpine glaciers and gypsum dissolution. The main part of the area is formed by gypsum. Following a forest fire, a mud flow originated within the landslide area in 1998.

The geomorphology of the area is characterised by a relative smooth topography that is abruptly truncated by a typical scar with gypsum outcrops in the upper part of the landslide. Further down, an accumulation zone thickens progressively and it may extend under the Quaternary sediments that fill the valley. The zone where the mud flow triggered off is clearly marked in the topography by a depression. The flow followed a shallow depression and eroded its borders. Progressively the material was deposed and the mudflow spread out into a very flat fan. This work is focused on the volume of the material mobilised by the mud flow.

Some important differences between the official Swiss Laser-DEM with a vertical precision better than 30 cm and differential GPS measurements have been observed (up to 2 meters with a mean difference of 0.5 meters). Therefore, volume analysis was made with a new high resolution DEM from more than 720 GPS points.

The volume calculation was made on the starting zone of the mud flow. The quantity of mobilised material was determined by calculating the volume between the present topography and the topography before the mud flow event. The ancient topography was created by interpolation of a surface between the borders of the starting zone.

Finally, a volume of 2500 $m^3$ was carried away by the 1998 mud flow, but the total volume of the flow may be significantly higher due to the basal and lateral erosion in the channel.