



Geomorphology and landscape evolution at the Chironico landslide (Leventina)

A. Claude (1), S. Ivy-Ochs (2), F. Kober (1), M. Antognini (3), and P.W. Kubik (2)

(1) Geological Institute, Earth Surface Dynamics Group, ETH Zurich, Switzerland (aclaude@student.ethz.ch), (2) Laboratory of Ion Beam Physics, ETH Zurich, Switzerland, (3) Museo cantonale di storia naturale, Lugano, Switzerland

The Chironico landslide is located in the Leventina Valley in the Swiss Alps. It comprises about 500 million m³ (Schardt, 1910) of crystalline granitic gneiss belonging to the Lower Pennic nappes, that detached from the western valley wall, slid along valleyward dipping foliation of 25-30 degrees and smashed into the Ticinetto stream mouth. The slide mass consists of a northern and a southern lobe separated by the Ticinetto stream.

¹⁴C ages from a piece of wood found in a borehole drilled in deposits of an upstream-dammed lake, north of the landslide yield an age of about 13'500 cal yr BP (Antognini and Volpers, 2002). These dates imply that the Chironico landslide is the oldest dated landslide in the Alps in crystalline rock. Through surface exposure dating with the cosmogenic nuclide ¹⁰Be, an absolute failure date can be assigned to the rockslide and a comparison to the obtained ¹⁴C ages can be realized. Furthermore it can be determined if the ages of both parts of the slide are coeval.

A GIS-based landscape analysis of a high resolution DEM is performed. The extraction of morphometric parameters as slope, relief and roughness with this software will facilitate to reconstruct the landscape evolution of the working area.

A runout model of the rockslide is generated with the three-dimensional Dynamic Analysis program (DAN3D) to get a runout distance, which will then help to better characterize the release area.

A pulse in landslide activity seems to have occurred during the early Holocene in the European Alps, as the valley flanks became unstable due to postglacial landscape modification and slope adjustment. The comparison of the timing and sedimentological and morphological character of the Chironico rockslide with other large landslides in the Alps can help to identify and understand possible triggering mechanism and regional timing with respect to deglaciation.

REFERENCES

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