



Erosive processes and slope instabilities occurring at the contact between two alpine tectonic units (Val de Bagnes, Switzerland)

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The influence of recent erosive mechanisms on geological hazard analysis is illustrated by a case study from the internal parts of the Swiss Alps. The investigated catchment area is located in the Val de Bagnes (southwestern Switzerland). It presents an annual occurrence of debris flows, landslides and rockfalls. The interaction of these various processes leads to the creation of a complex erosive system. The influence of each process is differentiated on the base of field investigations. The study focuses on rock and soil weathering, as well as on climatic effects, especially the melting of permafrost. In addition to these morphologic observations, geological, structural and mineralogical investigations are performed. These analyses enabled to determine different types of phyllosilicates using XRD analysis. The global behavior of this complex erosive system will be compared to the global brittle-extensive tectonic affecting the Western parts of the Alps. The studied catchment area is composed by two different tectonic and lithological units: the upper part consists in Paleozoic gneissic to prasinitic rocks ("Mt. Fort" nappe), topping a triassic sedimentary cover ("Siviez-Mischabel" nappe), mainly composed by quartzites and chlorito-schists. The contrast in rheology between these two units is stressed by the perpendicular crossing of an Oligocene normal fault, causing an intense shearing of the gneiss. Field observations suggest that this fault is more important than previously assumed. The resulting morphology favors slope instabilities. Furthermore, the whole catchment seems to be affected by a slow deep-seated landslide, whose major movement is vertical. This landslide has to be investigated and surveyed by terrestrial-LIDAR scanning.