Investigation of rock slope failure processes in the southern Swiss Alps

PhD student: Alessandro De Pedrini

Mail: alessandro.depedrini@supsi.ch

Cristian Scapozza[1], Christian Ambrosi[1], Federico Agliardi[4], Andrea Manconi[2,3]

[1] Institute of Earth Sciences, University of Applied Sciences and Arts of Southern SUPSI, Switzerland.

[2] Department of Earth Sciences, Swiss Federal Institute of Technology Zürich, ETHZ, Switzerland.

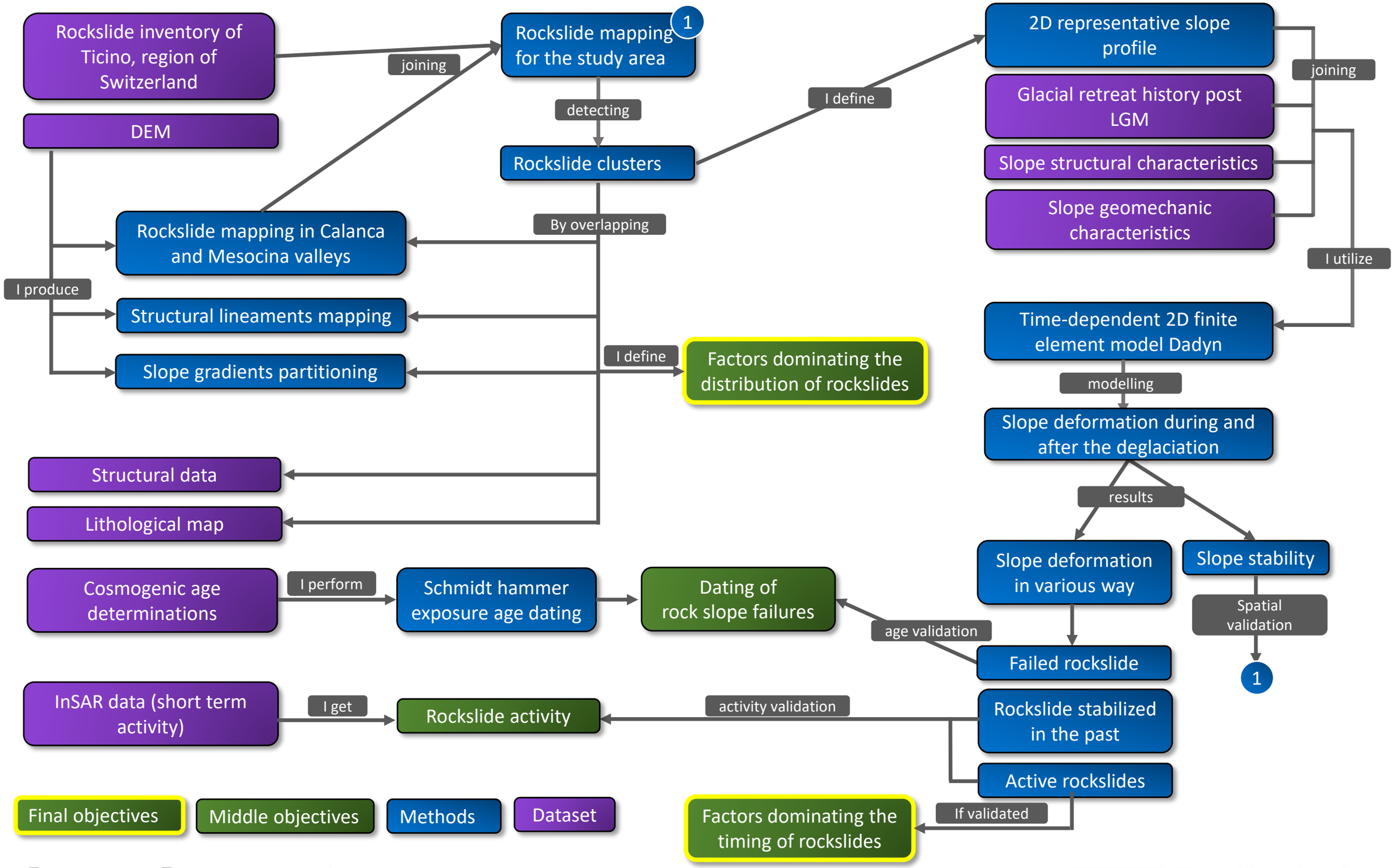
[3] WSL Institute for Snow and Avalanche Research SLF, Switzerland.

[4] Department of Earth and Environmental Sciences DISAT, University of Milano-Bicocca, Italy.

SUPSI University of Applied Sciences and Arts of Southern Switzerland

ETH zürich

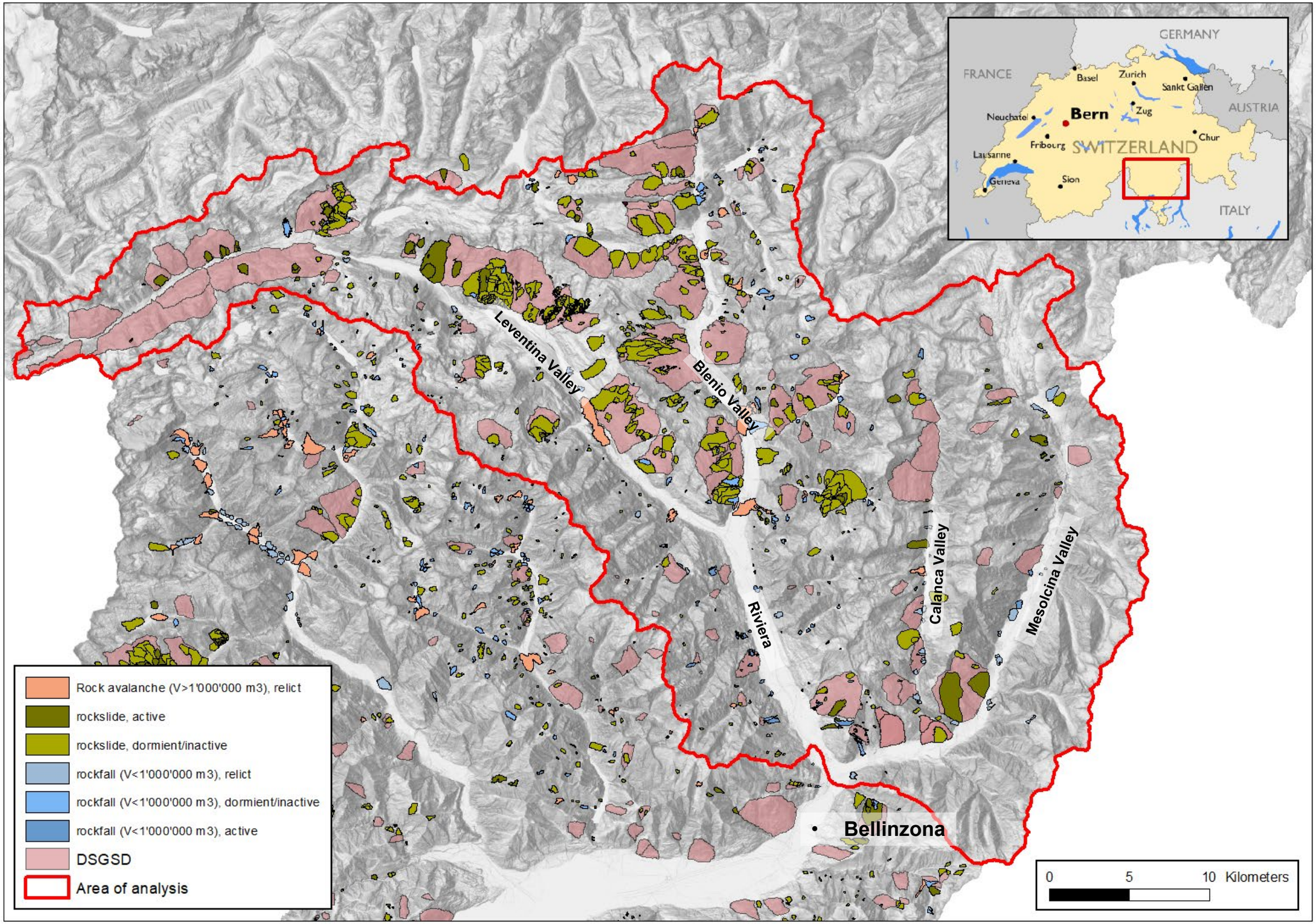
Main research question: **What geologic and morphoclimatic features dominate the development and timing of rockslides in the southern Swiss Alps?**



SUPSI University of Applied Sciences and Arts of Southern Switzerland

ETH zürich

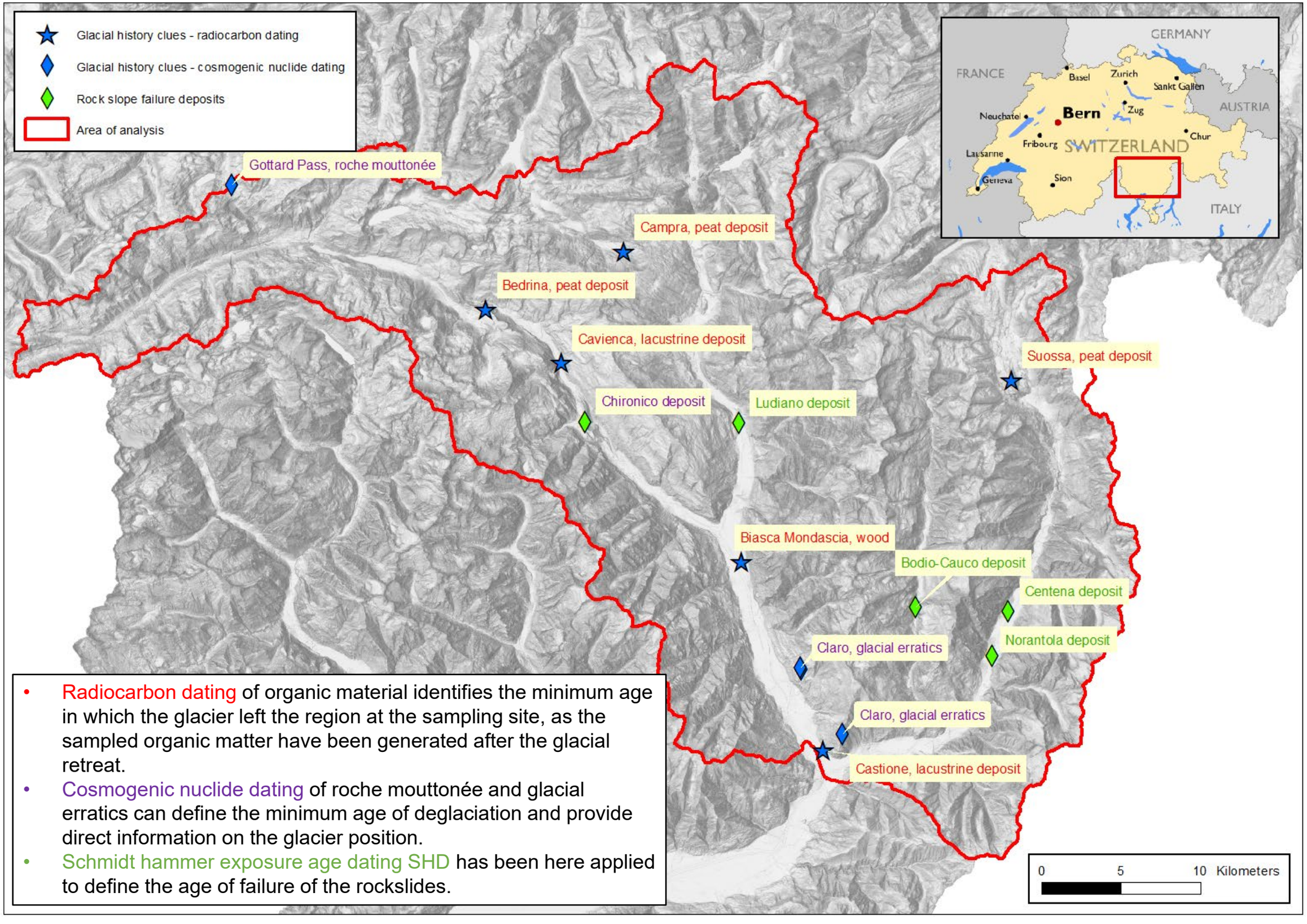
Rock slope deformation inventory



SUPSI University of Applied Sciences and Arts of Southern Switzerland

ETH zürich

Glacial history clues and rock slope failure deposits dating



- Radiocarbon dating of organic material identifies the minimum age in which the glacier left the region at the sampling site, as the sampled organic matter have been generated after the glacial retreat.
- Cosmogenic nuclide dating of roche mouttonée and glacial erratics can define the minimum age of deglaciation and provide direct information on the glacier position.
- Schmidt hammer exposure age dating SHD has been here applied to define the age of failure of the rockslides.

SUPSI University of Applied Sciences and Arts of Southern Switzerland

ETH zürich

Glacial history clues and rock slope failure deposits dating

- Schmidt hammer, also called concrete sclerometer, allows to measure a rebound value (*R*-value), which is directly proportional to the strength of the rock surface. Under the same climate conditions and for the same lithology, this can be directly correlated with the surface weathering and therefore to exposure-age.

- *R*-values were calibrated thanks to measurements carried out on surface of known age, determined from historical sources and from cosmogenic nuclide dating (CND)

- All these exposure ages indicate a collapse of the investigated rock slope failures only a few centuries after the deglaciation