

A NEW DATABASE OF ALPINE ROCK FALLS AND ROCK AVALANCHES

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Within the InterregIIIa *Rockslidetec* project (2003-2006), a new inventory of Alpine rock falls and rock avalanches has been established, with two main goals: a) on short term, provide the experts with a wide set of informations allowing an improvement of their analyses based on analogies with known cases, b) on longer term, set the basis for an advanced analysis of the phenomenon (triggering and propagation factors). This database contains two information levels: a) a comprehensive inventory of events of more than 10⁶ m³, covering the whole Alpine range, b) a detailed database, containing also smaller events, and covering mainly the working areas of the project partners (Valais, Aosta valley and Northern French Alps). The database will be available online in 2007 on the site www.CREALP.ch.

The inventory is mainly based on the compilation of existing published inventories (Montandon 1933, Strele 1936, Abele 1974, Eisbacher & Clague 1984) and other literature sources. The following work has been done:

- comparison of the inventories, identification of corresponding cases and elimination of duplicate records;
- separation of distinct events: some inventories agglomerate in a same case several successive events on the same location, or even different events in the same area. These have been considered as distinct events;
- identification of the main process for all events: most published inventories include, under the generic concept of landslides, various types of events, like debris flows, slides or even glacial lake outbursts. In order to keep the correspondance with the original inventories, non-rockfall cases have been maintained in the database ;
- determination of geographic coordinates for all cases.

In addition to the published sources, several tens of new cases, resulting from personal surveys of the project partners have been added. This results in a total of 550 events, among them around 360 are fast to extremely fast rock slope movements, the others being either uncertain or of other types. Many events involve process chains, like rockfalls in catchment basins reworked by subsequent debris flows.

This inventory allows already some considerations on spatial distribution of the cases, or on the temporal distribution of historical records. Among the 360 certain rock falls or rock avalanches, about 160 are dated: most are historical events, 15 are holocene events dated by radiocarbon or radionuclides. The distribution of historical events shows that their frequency is dependent on the density of the historical record. The few holocene events are equally distributed over the Holocene, but their number is insufficient to allow any conclusions on a possible influence of climate changes.

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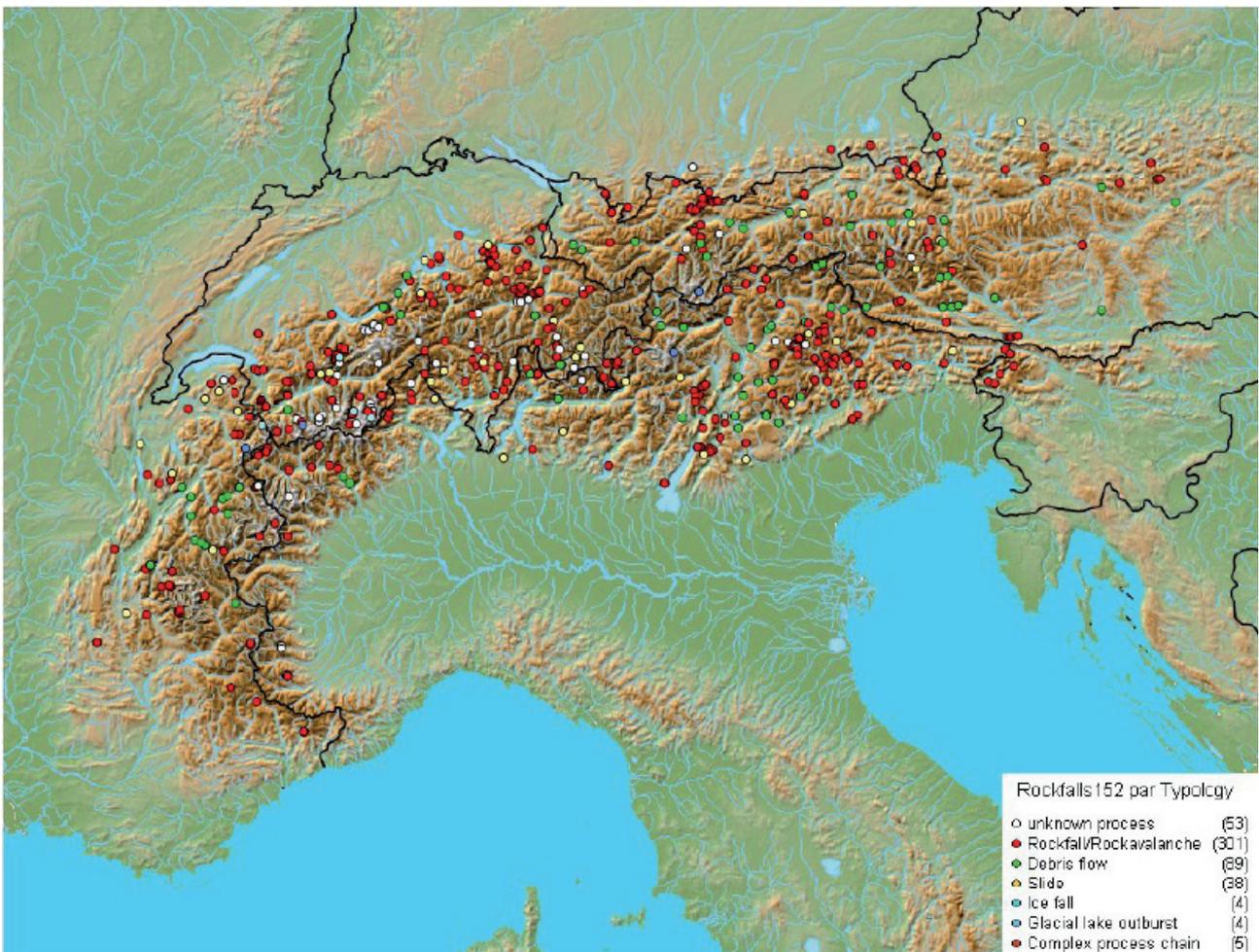


Fig. 1: Location map of the ca. 500 cases documented by published inventories.

The detailed database is designed to allow detailed analysis of triggering and propagation parameters. It contains therefore over 300 fields organized in six main domains: topographical and geological characteristics of the concerned valley slopes, initial profile of the slope, post-failure slope, characteristics of the failure zone (including jointing, triggering factors, ...), characteristics of the deposit, references to documents. Several tens of events have been documented in detail, ranging in volume from a few m³ to rock avalanches of several 10⁶ m³. Most cases are located in the working area of the project partners.

This project will be continued within the InterregIIIb project “ClimChAlp”, in order both to complete and improve the inventory and to extend the detailed database to the entire Alps, together with new partners from Germany, Austria, Italy and Slovenia. The collected data will be used in future for: search for similar cases in hazard assessment, statistical analyses of susceptibility factors, frequency analyses, giving constraints to hazard assessment, study of the influence of climate changes on the occurrence of rock avalanches during the Holocene period, analysis of propagation.

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