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An inventory of permafrost evidences for the European Alps

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Permafrost, especially in mountain areas, is characterized by an heterogeneous spatial distribution and, at the same time, measurements and observations of permafrost are sparse. In the European Alps, numerous local permafrost distribution models exist today but are usually based on a small number of data points from rather small regions. We have designed a strategy for standardizing differing local data sets with evidences of the presence or absence of permafrost into an inventory for the entire European Alps: we define a permafrost evidence to be a point or an area where permafrost is known to be present during a certain time or where its absence can be ascertained. Permafrost experts from all Alpine countries have contributed to the collection of data. The inventory of evidences was initiated in the framework of the Alpine Space project PermaNET and combines results obtained by many researchers and partly assembled by national monitoring programmes such as PERMOS or PERMAFRANCE. The inventory contains these evidence types: borehole temperature (BH), ground surface temperature (GST), rock fall scar (SC), trench or construction site (TR), surface movement (SM), geophysical investigations (GP), other indirect evidence (OIE) and rock glaciers (RG). The inventory was populated using four "calls for evidences" accompanied by a spreadsheet and detailed instructions. In total 35 individuals or institutions provided data in response. Every contributor provided information from their own research area, usually based on the re-interpretation of existing data and knowledge in view of the common data format used in this inventory. The total number of point evidences is 408, extending from 44.29 to 47.47° N and from 5.91 to 14.88° E and covering all Alpine countries except Slovenia. The rock glacier inventory integrates seven regional inventories from Italy, Austria, Switzerland and France with a total of 4,795 rock glaciers. GST, BH and GP are the most common the point evidences. Most points are from within Switzerland, France and Italy. In this presentation we present the the structure and the main data contained in this inventory. Such a collection of evidences does not only leverage existing data better and allow new investigations based on larger data sets but it also provides orthogonal information for the better interpretation of monitoring results.