



PERMOS - towards a standardized network for monitoring mountain permafrost in the Swiss Alps

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The Permafrost Monitoring in Switzerland (PERMOS) aims at documenting the state of mountain permafrost on a long-term basis. The network is based on two main categories of observation elements: (1) Subsurface temperatures are measured in boreholes along with ground surface temperatures (GST) in the surrounding areas, and (2) at a number of kinematic sites velocities of permafrost creep are determined by geodetic survey and/or photogrammetry. PERMOS has been built up since the early 1990s. Following a 6-year pilot-phase starting in 2000, the network has now taken root: for the years 2007-2010 the network is funded and integrated into the responsible monitoring structures in Switzerland by the Federal Office for the Environment (FOEN), MeteoSwiss, and the Swiss Academy of Sciences (SCNAT). Moreover, a PERMOS coordination office has officially been established.

The monitoring concept “PERMOS 2007” was updated and adapted based on the experiences of the pilot-phase. Based on the requirements and criteria described in the concept all potential elements were evaluated in early 2007. The base line was to continue rather few elements on a standardized high quality and technology level and to omit redundancies. The observation sites were categorised into A) approved element, B) element subject to verification in the next two years and C) no PERMOS element. Subsequently, the network 2007 consists of 8 A-rated drill sites, 9 A-rated GST sites and 5 A-rated kinematic sites. All B-rated elements (6 drill sites, 3 GST sites and 5 kinematic sites) are subject to additional installations or other strategic aspects

and a re-evaluation in 2009. During the years 2007 and 2008, approved elements will be standardized to achieve a consolidated network by the end of 2010.

A comprehensive monitoring network must be set up among interested partners from academia and administration. Academia provides the scientific permafrost know-how and the link to ongoing research projects, while administration is responsible for monitoring and provides political links. The pilot phase allowed for setting up a concept with parameters and elements that could be adapted according to gained experiences and new research results. After some 15 years, PERMOS has found its pace and complements the Swiss monitoring networks for glaciers and snow, which together contribute to a monitoring of the cryosphere in the Swiss Alps.

In this contribution we present the PERMOS 2007 network and the adaptations to the monitoring concept for the current phase 2007-2010, along with measurements and main results for selected PERMOS sites (e.g., the 20-year time series at Corvatsch-Murtèl in the Upper Engadin).