

Name of research institute or organization:

WSL Institute for Snow and Avalanche Research SLF

Title of project:

Long-term permafrost monitoring for PERMOS

Part of this programme:

PERMOS

Project leader and team:

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Project description:

The sub-horizontal Jungfrau Ostgrat borehole is located at 3590 m asl in the North-facing wall of the Jungfrau East ridge. It is 20 m long and equipped with 9 thermistors and a data logger. Rock temperatures vary between -4 and -7°C . Due to the time lag with depth, the highest temperatures are registered in winter and the lowest ones in summer. The high elevation of the borehole and its position in a steep rock wall make it valuable for long-term monitoring. After the catastrophic failure of Pizzo Cengalo in August 2017, the value of the Jungfrau data became particularly apparent, as it indicates that temperatures are rising in steep rock at high elevations. The borehole data clearly indicate a warming trend (Fig. 1). The borehole is part of the Swiss permafrost monitoring network PERMOS and the borehole temperature data can be viewed and downloaded from <http://shinypermos.geo.uzh.ch/app/BoreholeDataBrowser/>.

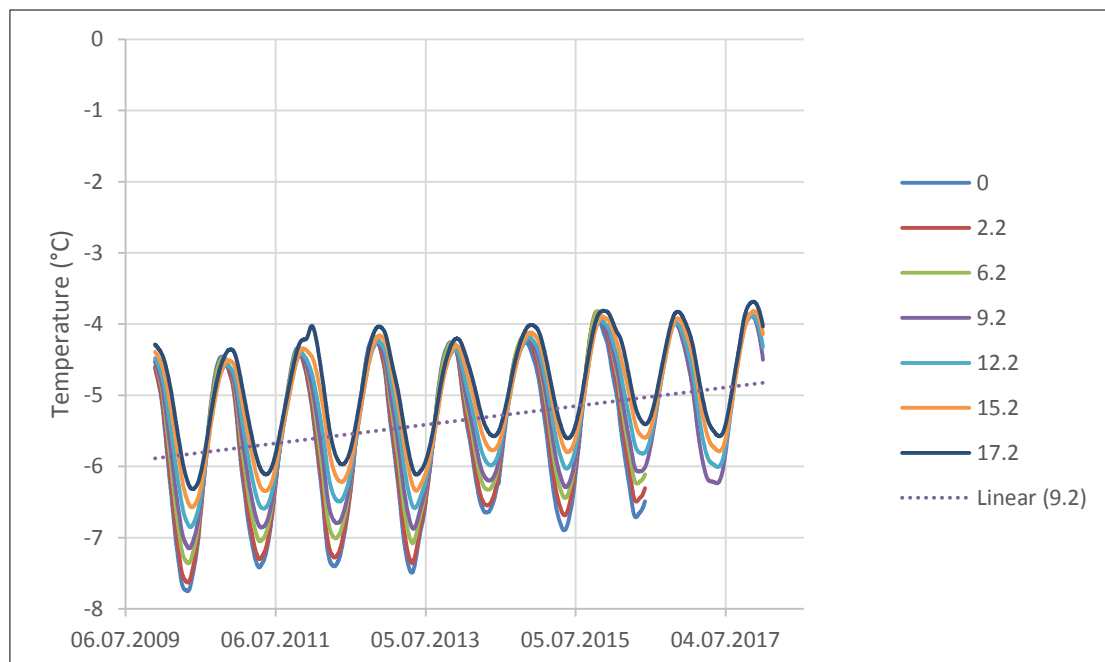


Figure 1. Borehole temperatures (2009-2017) in the Jungfrau East ridge borehole (legend: 0 is located 6 m from the outer surface of the rock wall). The 3 outermost thermistors were damaged by lightning in June 2016.

Key words:

Mountain permafrost, frozen rock walls, thermal regime, long-term permafrost monitoring

Internet databases:

<http://www.permos.ch>

<http://shinypermos.geo.uzh.ch/app/BoreholeDataBrowser/>

Collaborating partners/networks:

PERMOS

Scientific publications and public outreach 2017:

Refereed journal articles and their internet access

Draebing D., A. Haberkorn, M. Krautblatter, R. Kenener, M. Phillips, Thermal and Mechanical Responses Resulting From Spatial and Temporal Snow Cover Variability in Permafrost Rock Slopes, Steintaelli, Swiss Alps, Permafrost and Periglacial Processes, **28**, 140-157, doi: 10.1002/ppp.1921, 2017.
<http://onlinelibrary.wiley.com/doi/10.1002/ppp.1921/epdf>

Phillips, M., A. Haberkorn, H. Rhyner, Snowpack characteristics on steep frozen rock slopes, Cold Regions Science and Technology, **141**, 54-65, doi: <https://doi.org/10.1016/j.coldregions.2017.05.010>, 2017.

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