



Abstract book

"Shaping aquatic science for the future we envision"

Mountain permafrost as a relevant water resource in the context of alpine cryosphere degradation: an example from the practice.

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Around 80% of the Alpine glacier volume is predicted to vanish within the end of this century because of global warming. The glacier retreat is not only affecting distribution and hydrology of glacier-fed streams, but impacting availability, quality, and biodiversity of mountain water at Alpine scale. These alterations are challenging Alpine human communities, having profound implications for key socio-economical compartments such as drinking water supply, hydropower, and tourism. Within this scenario, mountain permafrost is becoming increasingly significant since its subsurface ice thaws at a slower rate in comparison to surface glacier ice. Springs and streams emerging from rock glaciers, i.e. creeping rocky landforms made of rock fragments that host subsurface ice and represent the most common evidence of mountain permafrost, are increasingly recognised as climate-resistant reserves of mountain water. Here we present the Sadole rock glacier (Trentino), which already represents the key water supply for the Alpine Municipality of Ziano di Fiemme. As such, the Sadole rock glacier and its meltwater are object of intensive multidisciplinary monitoring and research aimed at understanding geomorphology, as well as hydrological dynamics and future evolution. The Sadole Valley has been recently included as a pilot study area in the Alpine Space project Waterwise, which aims at increasing the climate resilience of mountain communities through an improved water management.