

XXVII Congresso
Associazione Italiana di Oceanologia e Limnologia



Noi siamo acqua

*Conoscere gli ecosistemi acquatici
per riconnettersi alla natura*

Abstract book



Napoli, 26-30 Giugno 2023

O.4.6 - Water resources influenced by mountain permafrost: potentials, services, and future challenges.

Monica Tolotti (1)*, Brighenti Stefano (2), Maria Cristina Bruno (1)

(1) Research and Innovation Centre, Fondazione Edmund Mach, Via Mach 1, 38098 S. Michele all'Adige (Trento), Italy

(2) Faculty of Agricultural, Environmental and Food Sciences, Free University of Bolzano/Bozen, Piazza Università 1, 39100 Bolzano, Italy

* email corresponding author: monica.tolotti@fmach.it

The subsurface ice contained in “rock glaciers, the most widespread evidence of mountain permafrost, represent a water resource that is increasingly attracting the attention of researchers and policy makers within the current context of climate warming, of which the retreat of Alpine glaciers represents one of the most striking effects. While glaciers are shrinking at accelerating pace, the hydrological and ecological relevance of permafrost-influenced water resources is growing. Indeed, these waters can partially buffer the effects of periods of drought in high elevation ecosystems, where they represent a key refuge for cold stenotherm aquatic organisms threatened with extinction by warming conditions. However, processes linked to the degradation of mountain permafrost can affect water quality by enhancing the concentration of solutes, including trace elements. The associated deterioration of water quality has important effects both on aquatic biodiversity and on the potential human use as drinking water supply, and for farming at high altitudes. We will discuss the potentials and challenges of the water resources influenced by permafrost in modulating the adaptation of the Alpine region to global change based on the results of recent and ongoing studies conducted in the Central-Eastern Alps in catchments with varying degrees of deglaciation.