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Abstract Book

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Preliminary results on the evolution of proglacial ponds in the deglaciating Alps

Miss Maria Vittoria Tenci[1,2], Mr Marco Toffolon[1], Mr Walter Bertoldi[1], Mr Stefano Brighenti[3], Mrs Maria Cristina Bruno[2], Mr Leonardo Cerasino[2], Mr Massimo Pindo[2], Mrs Monica Tolotti[2]

[1]Department of Civil, Environmental and Mechanical Engineering, University of Trento, Trento , Italy, [2]Research and Innovation Centre, Edmund Mach Foundation, San Michele all'Adige (TN), Italy, [3]Faculty of Science and Technology, Free University of Bolzano, Bolzano, Italy

6E_RS05_Small water bodies, June 20, 2023, 4:15 PM - 5:30 PM

Biography:

Maria Vittoria Tenci is a PhD candidate at the Department of Civil, Environmental and Mechanical Engineering at the University of Trento and at the Research and Innovation Centre at the Edmund Mach Foundation (Italy). She graduated in Global Change Ecology at the University of Trieste (Italy). Her main research interests are hydrobiology and freshwater ecology. Currently, she is developing a multidisciplinary project addressing the origin, evolution and fate of proglacial lakes in the Ortles-Cevedale Mountain group (Italy), with a focus on microbial and algal communities and their relations with the environmental changes related to glacier retreat.

Deglaciation is one of the most evident effects of the ongoing climatic changes on the Alpine environment. One of its common consequences is the formation of new water bodies in the proglacial area, where proglacial lakes and ponds are increasingly relevant ecosystems for the mountain landscape. The EVERLAKE project focuses on a recent system of proglacial ponds that originated from the retreat of the Zufall/Cevedale Glacier (Plima catchment, Central/Eastern Italian Alps). The aims of the project are to: (i) provide a first hydroecological characterisation of these pond ecosystems from a physical, chemical and biological point of view; (ii) understand their evolutionary trend during the process of deglaciation, with a space-for-time substitution approach. Here, we present data collected during the ice-free season 2022, showing the seasonal development occurring in three ponds located along a gradient of distance from the Cevedale Glacier terminus (i.e., at 2700-2900 m a.s.l.). We monitored water level, temperature and electrical conductivity and assessed the origin of water through analyses of stable isotopes ($\delta 2H$, $\delta 18O$). Bathymetric measurements were performed to estimate the residence time of each waterbody. We also analysed basic water chemistry, concentrations of trace elements, benthic and planktonic chlorophyll-a and organic content. The biological communities of these poorly known aquatic ecosystems were characterised by adopting an integrated approach combining morphological observations of microalgae and 16S and 18S rRNA metabarcoding of eDNA from both benthic and planktonic samples. The ponds showed different ecological conditions related to their distance from the glacier margins.