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## >> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

## Submitted Abstract

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First Author First Name	Stefano
Submitting Author First Name Last Name	Stefano Fenoglio
Correspondence	stefano.fenoglio@unito.it
Co-Authors >> E-Mails will be not listed	Bertolotti, Silvia; Bona, Francesca; Bonetta, Silvia; Falasco, Elisa; Macrì, Manuela; Marino, Anna; Minella, Marco
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imc2022@uibk.ac.at +43 512 507 54442



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## Abstract

Stream ecosystems are particularly sensitive to climate change, because variations in precipitation, temperature, and evaporation directly alter river flow regimes. Higher water temperatures and the disruption of hydrologic cycles, further exacerbated by anthropogenic activities (e.g. dams, water abstraction, streambed alterations) can lead, in turn, to dramatic ecological impacts One of the least considered but potentially most dangerous aspects of climate change is the impact this can have on the river quality in relationship to the discharge of wastewater treatment plants. In Alpine environments, the variation in the 'quantity' of water is always considered as a problem while the 'quality' of water and its repercussions on aquatic environments and biodiversity is rarely taken into consideration. Wastewater treatment plants are essentially calibrated on two factors: the number of equivalent inhabitants and the flow of the receiving river body. While the first tends to keep constant over time, the second has been gradually reducing in the last decades. With the current decrease in flow rates, Alpine rivers are experiencing an increasing water shortage. To monitor how this reduction in flow rates affects the sustainable efficiency of the wastewater treatment plants in mountain areas, we organized a sampling campaign in three Alpine rivers of Piemonte (NW Italy): Pellice, Stura di Lanzo and Malone. On a monthly basis, starting from January 2022, samplings were carried out in upstream and downstream sections considering: a) biodiversity (density, structural and functional organization of benthic macroinvertebrate and diatom communities); b) chemical guality (concentration of the main nutrients and determination of the most important chemical parameters); 3) microbiological quality (bacterial indicators and pathogenic bacteria ). The results were then analyzed in the light of the hydrometric data of the various stations. In conclusion, this work has a considerable applicative importance in the sustainable water use perspective, because it underlined the problems related to the indiscriminate withdrawals of water from rivers. We can combine the need to protect biodiversity with the urge to preserve ecosystemic services and protect human health. This work has been realized thanks to the multidisciplinary approach of the SUSTNET (Sustainable Development and Cooperation) Doctoral School, which includes groups from UNITO that study the sustainable use of water resources from different aspects such as stream biodiversity, water chemistry, environmental microbiology and hygiene.

Research Area Mountain Regions Innrain 52f 6020 Innsbruck Austria WWW.IMC2022.INFO

imc2022@uibk.ac.at +43 512 507 54442