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EFFECTS OF DEGLACIATION ON ALPINE STREAM ECOSYSTEMS: PRELIMINARY FINDINGS

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Glaciers shrinkage and permafrost degradation are amongst the most evident and dramatic effects of human-driven climate change, and the loss of cryosphere is determining radical shifts in the hydrology and ecology of streams, also in the European Alps. Due to their different sensitivity to climate adjustments, a decreased/lost discharge from glaciers and a parallel increase of permafrost ice contribution to water flow are foreseen in Alpine catchments, and rock glaciers (a common form of permafrost in the Alps) may become increasingly important for the hydroecology of streams. While a large amount of literature is available on the effects of glacier retreat on freshwater ecosystems, very little is known about the ecology of streams fed by rock glaciers. Nevertheless, permafrost ice degradation can have drastic effects on the water physico-chemistry, including pollution from heavy metals, acidification and increased electrical conductivity. We present the preliminary results of a PhD project aimed at assessing the impacts deglaciation on Alpine stream ecosystems. A set of glacier, rock glacier and groundwater fed streams have been selected in the Zay and Solda catchments (South Tyrol, Italy) in order to assess ecological differences among stream types. Water source (H-O isotope analysis), DOC, physico-chemistry and metal concentrations have been analysed at 16 sampling sites in summer 2017, in order to compare habitat characteristics with benthic communities (periphyton biomass, diatoms, macroinvertebrates and meiofauna diversity and abundance), and assess longitudinal patterns and seasonal differences as a function of glacial and periglacial influence. In addition to this, stable isotope analysis (C, N) and metal concentrations in organisms have been undertaken in order to describe the differing foodwebs and the transfer of pollutants.