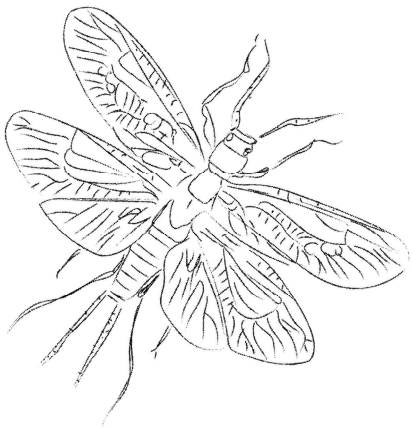
ABSTRACT BOOK



RS2 Climate change and freshwater ecosystems

RS2_O1_Influence of the paraglacial landscape along the river continuum in a deglaciating Alpine catchment

Author(s): Stefano BRIGHENTI[1,2]*, Maria Cristina BRUNO[2]; Monica TOLOTTI[2]; Michael ENGEL[3]; Geraldene WHARTON[4]; Walter BERTOLDI[5]

Affiliation(s): [1]University of Trento, Italy; [2]Edmund Mach Foundation (San Michele all'Adige), Italy; [3]Free University of Bolzano, Italy; [4]Queen Mary University (London), UK; [5]University of Trento, Italy

Presenting author*: stefano.brighenti@unitn.it

Abstract

Several deglaciating catchments in the Alps have already surpassed the peak water of maximum discharge associated to glacier shrinkage, and are increasingly dependent on stochastic precipitation, groundwater sources and permafrost influence. We investigated the seasonal (June, August, September) and daily (every 3 hours) variability of water temperature, discharge, turbidity, electrical conductivity, and channel stability in a glacier-fed stream in a deglaciating area of the European Alps (Zay Valley), from the glacier snout to the closing section (13 stations). These parameters, measured also in the main tributaries (i.e. a rock glacier outflow and a groundwater-fed stream), were used to investigate the role of the glacier, a proglacial lake, a moraine, a rock glacier, and a talus slope in shaping the stream conditions along the river continuum. Mixing diagrams were used to identify different runoff components during baseflow conditions. Spatial trends were attributed to the decreasing influence of the glacier, paralleled by the increasing role of the rock glacial and groundwater tributaries. Seasonal and daily trends were attributed to the different phases of the alpine summer. The glacial influence dropped directly below the proglacial lake/moraine body in all periods. Noteworthy, the rock glacial stream influenced the parameters of downstream waters in the gradient, especially in September when glacial ablation was lowest. Our work suggests that the paraglacial landscape is becoming a key hydrological driver in the late stages of deglaciation, and that rock glaciers have an increasing role in shaping water conditions at the overall catchment scale.