Assessment of habitat quality and interactions between macroinvertebrates and biofilms in an alpine stream. Identification of the nature and food sources of macroinvertebrates.

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The growing interest in the relationship between climate change, glacier melt, and the evolution of aquatic species is a source of much research. Particular attention has been paid to mountain streams that are impacted by glacier melt and for which hydraulic and ecological variations can be significant. The latter provide unique and specific habitat conditions for aquatic species. Very low temperatures, bed instability or significant variation in flow regime during the warm season are parameters that make these environments particularly difficult and that govern the spatial and temporal distribution of the habitats of these species. Benthic communities living in these extreme environments are vulnerable and under significant stress, particularly when climatic conditions change and modify local biotic and abiotic conditions. In this context, interactions between different taxonomic groups and trophic levels require particular attention to be given to understanding ecosystem structure and evolution.
In this study, we focus on the diversity of aquatic fauna and the food chain involving macroinvertebrates and biofilms in the alluvial plain of the Otemma glacier (Valais, Switzerland). The thesis aims to determine the biological state of the watercourse by assessing the richness and diversity of macroinvertebrate species living in the glacier's flood plain, as well as to identify the nature and sources of their food. This last point is studied using analyses of stable isotopes (δ13C and δ15N) and the C:N ratio performed on samples of macroinvertebrates, terrestrial and aquatic plants, and organic fine particles transported in the watercourse. The sampling campaign was carried out in summer (July and August), on several transverse transects of the alluvial plain. Samples were collected on both the mainstream and the lateral tributaries, in order to make temporal and spatial assessments.

Figure 1: Otemma glacier and floodplain. [Roncoroni, 2019]