Submitted Abstract

ID IMC22-FSAbstr- 641

First Author	
First Name	Pierre (1)
Last Name	Chanut
Submitting Author	
First Name	Pierre
Last Name	Chanut
Correspondence	pierre.chanut@eawag.ch
Co-Authors >> E-Mails will be not listed	Datry, Thibault (2); Schaer, Bettina (1); Robinson, Christopher (1)
Organisations	1: Eawag, Switzerland 2: INRAE, UR RiverLy, centre de Lyon-Villeurbanne, Villeurbanne, France
Country	Switzerland
Region	Western Europe

Title	Macroinvertebrate Assembly And Organic Matter Decomposition In Relation To Flow Intermittence In Alpine Streams.
Keywords	Macroinvertebrates, Intermittence, Decomposition, Alpine Streams
Type	List Of Focus Session
Focus Session ID	04

Abstract

Flow intermittence is prevalent in glaciated alpine catchments, where kryal streams may typically dry in winter and rhithral streams dry at the end of summer. But with thermal changes and reductions in snow and ice cover, flow intermittence is expected to intensify and become more spatially synchronized within alpine stream networks. While the effects of single drying events on macroinvertebrates are well documented, much less is known about the ecological effects of drying regimes differing in frequency, duration, timing and spatial extent. Here, we used modified light sensors to characterize intermittence regimes in 75 alpine streams from 4 glaciated alpine catchments in the Swiss Alps. We also sampled macroinvertebrates at three dates and quantified organic matter decomposition rates using standardized leaf bags and cotton strip bioassays. We investigated how frequency, duration and timing of drying events as well as habitat features affect structural and functional aspects of stream ecosystems. We also examined the linkages between intermittence, community attributes and decomposition rates. Finally, we simulated theoretical metacommunity patterns and compared these with observed data to better understand how connectivity and dispersal influence community resilience to drying. The analysis is ongoing, but preliminary results suggest taxonomic and functional diversity as well as the abundances of specific functional groups responded negatively to increasing drying frequency. Leaf litter and cotton strip decomposition were also negatively affected by increasing intermittence. Interestingly, the upper quantiles of these response variables showed the strongest responses along the intermittency gradient. This shows that high flow intermittence exerted a strong constraining effect on biota and functional properties, whereas other factors may influence these variables at low intermittence levels. Overall, our research suggests that increasing intermittence in glaciated alpine catchments may drive significant changes in the biodiversity of alpine streams. Importantly, these changes may in turn affect the functional properties of aquatic ecosystems (e.g., organic matter decomposition), which could affect downstream ecosystems through changes in resource flows.