

Submitted Abstract

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Abstract

Worldwide, floods and droughts are occurring at an increasing rate due to climate change. The consequences of climate change are often exacerbated by flow regulation. These pressures further affect fluvial ecosystems, their biotic communities, and the ecosystem services they provide. Macroinvertebrate communities are an important element of a rivers' biodiversity and govern many ecosystem functions and services. Changes in the natural flow regime due to climate change, in combination with anthropogenic pressures, have severe impacts on these communities. In spring 2019, mountain streams in the Karun River catchment, the largest river system of Iran, experienced three major waves of rain and floods within two weeks; i.e., a 1-in-100 years event. We will present how structural and functional characteristics of local macroinvertebrate communities responded to and recovered from these extreme floods. For this aim, we measured water quality parameters, physical habitat characteristics, and sampled macroinvertebrate communities in 53 sites before and after this flood event. We calculated functional community composition and functional diversity indices based on existing traits databases. Furthermore, we collected available high-resolution precipitation and discharge data covering the entire catchment, and calculated an index of flooding intensity, which revealed substantial differences for the different regions of the catchment. We combined functional and hydrologic data to identify patterns of macroinvertebrate communities response across a gradient of flood disturbance, to understand the mechanisms of resistance/resilience of macroinvertebrate community to such events. Our findings benefit our understanding of the impacts of extreme floods on benthic macroinvertebrate communities and their recovery in an understudied region.