

Living on the edge: Mediterranean streams as natural laboratories for understanding the impact of extreme hydrological events on biogeochemical transport and cycling.

Bernal, Susana, Center of Advanced Studies of Blanes (CEAB-CSIC). Email: sbernal@ceab.csic.es. Orcid #: 0000-0002-6726-8840

Peñarroya, Xavier, Center of Advanced Studies of Blanes (CEAB-CSIC). Email: xpgalceran@ceab.csic.es

Jativa, Carolina, Center of Advanced Studies of Blanes (CEAB-CSIC). Email: carolina.jativa@ceab.csic.es

Casamayor, Emili O., Center of Advanced Studies of Blanes (CEAB-CSIC). Email: casamayor@ceab.csic.es

Lupon, Anna, Center of Advanced Studies of Blanes (CEAB-CSIC). Email: alupon@ceab.csic.es

Ledesma, José J.L., Department of Hydrogeology, Helmholtz Centre for Environmental Research – UFZ, Leipzig, Germany. Email: jose.ledesma@ufz.de

Rocher-Ros, Gerard, Department of Forest Ecology and Management, Swedish University of Agricultural Sciences, Umeå, Sweden. Integrative Freshwater Ecology Group, Centre for Advanced Studies of Blanes (CEAB-CSIC), Blanes, Spain. Email: gerard.rocher.ros@slu.se

Catalán, Núria, Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, Spain. Email: ncatalangarcia@gmail.com

Martí, Eugènia, Center of Advanced Studies of Blanes (CEAB-CSIC), eugenia@ceab.csic.es

Climate warming is inducing more frequent and intense precipitation events and extended periods of droughts in many regions of the world, which alter the hydrological regime of streams and rivers by increasing the probability of extreme hydrological conditions. Mediterranean-climate regions are used to experience extreme hydrological events on a seasonal basis, and thus, fluvial ecosystems in this region can be used as natural laboratories for understanding how future climate will impact ecosystem structure and functioning in other biomes. In this talk, we will use empirical and modelling approaches to illustrate how the alternance of large floods and intense droughts influence the transport and processing of nutrients and organic matter in Mediterranean fluvial networks. Specifically, we will show how intense floods and droughts can impact stream microbial assemblages and associated biogeochemical processes. We will also discuss how extreme droughts can magnify point-source contamination in Mediterranean streams draining urban landscapes, and to which extent in-stream biogeochemical processes can contribute to mitigate water contamination and nutrient excesses in the receiving streams. Ultimately, we aim to share the lessons learned from ecosystems naturally experiencing multiple extreme hydrological events, to discuss how we can better cope with climate change and mitigate its impacts on hydrological flow paths and the transfer and cycling of matter in stream ecosystems.