

Pre-Doctoral Research Project

Temporary fluvial ecosystems and global change: effects on ecosystem structure and functioning

We are seeking **two PhD students** to join an interdisciplinary research team on freshwater ecology at the Department of Ecology at the University of Barcelona (UB) and at the Catalan Institute for Water Research (ICRA), based in Girona, Spain. The candidates will participate in the research project FUNSTREAM (*Temporary fluvial ecosystems and global change: effects on ecosystem structure and functioning*, CGL2014-58760-C3-1,2-R), joint project UB-UdG-ICRA.

Project summary:

According to the global climate change predictions, the Mediterranean region is threatened by an increase in temperature and a reduction of precipitations at the end of the 21st century. These alterations will directly impact the water availability as well as the frequency and intensity of drought episodes. The main objective of FUNSTREAM is to understand how the hydrological temporality will affect the structure and functioning of river ecosystems. In this context, “temporality” integrates the variability in frequency, duration and predictability of flow intermittence, as well as other related natural or anthropogenic stressors (for instance: quantity and quality of organic matter or eutrophication degree). Therefore, the specific objectives of FUNSTREAM are: 1) To characterize the relationship between the frequency and duration of flow intermittency and the quantitative and qualitative biogeochemical processing of organic matter (OM) in temporal fluvial systems. 2) To explore the response of biotic communities structure and function (OM processing) in relation to the flow intermittency frequency and duration. 3) To discern the key factors associated to these changes, and predict the structural and functional responses of fluvial temporary ecosystems. Changes in biodiversity and ecosystem functioning are expected to be shaped by temporality degree. Organic matter decomposition, algal and bacterial carbon uptake or the greenhouse gases (GHG) emissions are function of the biota activity. Consequently, fluvial reaches affected by different frequency and duration of flow intermittency could show differences in the organic matter and therefore in its quantity and quality. These changes will determine the resource-consumer relationships and the food web as a whole. Furthermore, according of the biotic activity, GHG emission can increase or decreases in these fluvial reaches.

FUNSTREAM has a clear experimental approach with three main packages: i) experimental field work in the Ebro, Fluviá, Onyar and Tordera catchments; ii) controlled laboratory experiments with microcosmos (sediment cores) and, iii)

mesocosms (artificial channels) experiments. Finally a global synthesis of collected data will be used to identify general trends and to model and predict the structural and functional responses of temporary fluvial ecosystems, so we can gain understanding of the new hydrological scenarios in the Mediterranean catchments. The knowledge generated with this proposal will provide key elements for the ecosystem management in semiarid regions, like the Mediterranean, and also for more temperate zones potentially affected by water scarcity as consequence of global change.

The scholarship is funded under the Spanish National Programme for Training Human Resources 2015 (Formación de Personal Investigador, FPI-MICINN) (<http://www.micinn.es/>). Candidates must have a bachelor's and MSc degree (to be finished during this present academic course 2014-2015) in Biology, Environmental Sciences or similar areas. Expedient marks, experience in the fields related with the project aims during bachelor or master practices, and fluency in English will be positively evaluated. If you are interested, please send an e-mail to Dr Margarita Menendez (mmenendez@ub.edu) for the UB scholarship, and to Dr Vicenç Acuña (vicenc.acuna@icra.cat) for the ICRA scholarship, attaching a brief *curriculum vitae*, **before 23rd of June.**

Formal applications must be processed through the web portal of the Spanish Science Ministry
<http://www.idi.mineco.gob.es/portal/site/MICINN/menuitem.dbc68b34d11ccbd5d52ffeb801432ea0/?vgnnextoid=fed2bf0be2c6d410VgnVCM1000001d04140aRCRD&vgnnextchannel=11f35656ecfee310VgnVCM1000001d04140aRCRD>
(Deadline for applications: June 29th)