



Euro-FLOW: a European training and research network for environmental FLOW management in river basins. A MARIE SKŁODOWSKA-CURIE ACTIONS Innovative Training Network (ITN) funded under H2020-MSCA-ITN-2017

ESR 10: Effects of hydrological and water quality alteration on river fish and macroinvertebrate production.

3 year fixed- term PhD position.

Host institute: Universidad de Cantabria – Instituto de Hidráulica Ambiental de Cantabria, Spain

Supervisors: José Barquín, Francisco Peñas (UC-IHC, Spain), Gabriel Singer (IGB, Berlin, Germany), Lee Brown (University of Leeds, UK)

Project Description:

A major challenge that resource planners face today is managing ecosystems to provide multiple services to societies. In many cases, management for services involves trade-offs, such that increasing the supply of one reduces the supply of another. For example, water for irrigation is made possible by massive storage in reservoirs although this may also have serious implications for the provisioning of other services (e.g. water quality or fish biomass). This PhD will explore how water quality changes (e.g., thermal regimens and suspended solids) link to different reservoir uses and how these changes scale down to affect secondary production of benthic macroinvertebrates and fishes.

Secondary production is a very important ecosystem function that quantifies the growth of heterotrophic biomass and that it relates to the energy transfer in ecosystems. Secondary production estimates will allow us to understand how hydrological alteration and water quality changes (e.g., changes to temperature regimens) alter river food webs and affect the provisioning of a range of river ecosystem services (e.g., fish-food). This PhD will use specific control-impact designed field surveys and a number of experiments in order to better understand how hydrological alteration and water quality changes affect secondary production in river ecosystems.

Objectives:

- (1) Establish the link between hydrological alteration types and water quality changes
- (2) Quantify secondary production of fishes and macroinvertebrate river reaches affected by different reservoir operation rules and in natural ones.
- (3) Study wider implications of biomass production for the aquatic food web and provisioning services

Expected outcomes:

- (1) Knowledge of how water characteristics (i.e. temperature, suspended solids, dissolved organic matter and nutrients) change in different hydrological alteration groups
- (2) Effects of hydrologic/water quality alteration on secondary production of fishes

(3) Effects of hydrologic/water quality alteration on secondary production of benthic macroinvertebrates

Secondments:

A 3 month stay at University of Leeds (Leeds, UK, host: Lee Brown) with the purpose of data collection and carrying out food web analysis.

A 3 month stay at ISPRA (Rome, Italy, host: Martina Bussettini) with the purpose of understanding EU e-flow policy and dissemination routes.

Eligibility Criteria:

* Applicants must not have resided or carried out their main activity in Spain for more than 12 months in the 3 years immediately prior to their recruitment¹.

* Applicants must hold a first degree and/or Masters degree in biology/ecology or a related discipline and be highly motivated to work in an international team including frequent travel between the Euro-FLOW beneficiaries and project partners.

* Experience in surveying and dealing with river macroinvertebrate and fish data are advantageous. Experience on modelling biological communities and a strong statistical background is also desirable.

* Applicants must not have more than 4 years (full time equivalent) research experience at the date of their recruitment¹. This is counted from the date they obtain the degree that would let them start work on a doctorate. They must not have been awarded a doctoral degree.

* Applicants must have excellent written and spoken English skills.

Other requirements:

¹Date of recruitment is defined as the first day of the applicant's employment i.e. the start date indicated in their employment contract.

EuroFLOW Information:

The regulation of river flows is one of the biggest stressors affecting river ecosystems across the world. In many countries, major legislative efforts are therefore underpinning the development of new approaches to mitigate the impacts of river flow regulation. These approaches are based on optimising the management of river flows to maintain services to humans (e.g. water supply, hydropower) whilst protecting and/or rejuvenating the aquatic environment with water of adequate quantity and quality in space and time (i.e. environmental flows). In this context, a field of applied aquatic science has developed to generate the evidence base for identifying the best ways to manage the quantity, quality and patterns of environmental flows to sustain river ecosystems, Euro-FLOW will train a new cohort of researchers to be future leaders in this field. Within Euro-FLOW, 15 early-stage researchers will develop new theoretical and empirical insights via ground-breaking experimental manipulations, large-scale field surveys and development of cutting-edge models to inform the management of water flows and aquatic ecosystems in river basins. Future research leaders will be developed through advanced training in: (i) river ecosystem science in relation to environmental flows; (ii) transferable scientific and life skills; (iii) collaborative working with international and inter-sectoral networking. Euro-FLOW will produce scientists with the ability to span subject boundaries, e.g. hydrology, geomorphology, geochemistry, ecology, microbiology, modelling and environmental management. The strong involvement of the non-academic sector will provide the PhD students with a holistic perspective on career opportunities.

Application details

The application should contain a cover letter that states your motivation, a CV and supporting documents about your education and studies (i.e. transcripts, certificates) and professional experience where applicable and two references. If you are applying for more than one EuroFLOW position, please rank your preferred projects.

Contact Dr Jose Barquin jose.barquin@unican.es for information on how to apply

Closing date: 30 November 2017

Post start date: February 2018