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 7: Basin-region hydromorphological alteration links to biodiversity and ecosystem functioning.

3 year fixed- term PhD position.

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

Supervisors: José Barquín, César Álvarez (UC-IHC, Spain), Gabriel Singer (IGB, Berlin, Germany), Ben Gillespie (Yorkshire Water Services LTD, UK)

Project Description:

The influence of the natural flow regime on river processes and functions is well known and research focused on the implications of altered flow regimes has increased rapidly since late 1990s. It is now widely accepted that maintaining some degree of similarity to the various pre-impacted combinations of flow magnitude, timing, duration, frequency and rate of change is required to maintain river ecosystem biodiversity and functions. In this regard, the first step through the adoption of appropriate conservation and recovery measures is identifying the extent to which the flow regime deviates from natural conditions. Reservoirs vary in size, level of impoundment, function and operational rules, so generalizations of their potential hydrologic alteration (HA) and ecological impact are difficult.

This PhD will provide a regional perspective on how different types of natural flow regimes (i.e. different hydrological classes) shape river biological communities and river metabolism and how hydrological alteration (of different types according to reservoir uses) change these natural patterns. The PhD will focus on identifying which are the main hydrological characteristics that maintain or produce changes on river biological communities and processes. The candidate will use different approaches to achieve this main objective from exploring existing regional macroinvertebrate, fish and river metabolism databases, to a selection of control-impact field design surveys for biodiversity and metabolism characterization and also modelling methods.

Objectives:

(1) Link specific changes of natural hydrological regimes to patterns of biodiversity and ecosystem functioning

(2) Developing methods and approaches to understand linkages between paired hydrological and ecological data

(3) Spatial modelling and extrapolation of hydrological alteration to river reaches based on reservoir uses.

(4) Model biodiversity and ecosystem functioning responses to hydrological alteration.

Expected outcomes:

(1) Determination of hydrological alteration patterns at large spatial scales

(2) Establishment of main changes on river biodiversity and ecosystem functioning according to different hydrological alteration types

(3) Recommendations for integrated catchment management on e-flow regimes

Secondments:

A 3 month stay at IGB (Berlin, Germany, host: Gabriel Singer) with the purpose of building R-scripts for ecosystem functioning analysis.

A 3 month stay at YW (Yorkshire, UK, host: Ben Gillespie) with the purpose of analyzing the effects of hydrological alteration from reservoir and land use changes.

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 recruitment[1].

* 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 recruitment[1]. 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:

[1]Date 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