



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 15: Towards integrated e-flow assessment at multiple scales

3 year fixed- term PhD position.

Host institute: Helmholtz-Centre for Environmental Research - UFZ

Supervisors: Prof. Martin Volk, Prof. Ralf Seppelt (UFZ)

Project Description:

Environmental flows (e-flows) are defined as the “quantity, timing and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihood and well-being that depend on these ecosystems”. Hence, this includes basic elements of survival, improved community health, enhanced security, and better social relations. Environmental flows support aquatic biodiversity and a range of provisioning ecosystem services such as clean water, plants, building materials and food like fish or fishery products, but also regulating ecosystem services, such as for erosion, pollution, flood, and pest control.

There is a need for methods to assess ecological impacts of flow management at a range of scales so that appropriate regional management can be implemented, which could be realized by analyzing environmental flow as a key indicator. Hence, this PhD thesis will use multi-criteria optimization to identify and assess the relationships and trade-offs among land and water use, e-flow requirements, and related ecosystem services on local to regional scales. As a main result the project will provide a scale specific framework to evaluate scale-specific e-flow and related ecosystem services to provide related sustainable management strategies.

Objectives:

- (1) Defining the e-flow characteristics, influencing factors and related ecosystem services at local to regional scale case study areas
- (2) Developing a scale-specific framework for e-flow (and related ecosystem services) assessment by using multi-criteria approaches/optimization
- (3) Provision of scale-specific strategies for sustainable e-flow management

Expected outcomes:

- (1) New knowledge of local to regional factors influencing e-flow related ecosystem services
- (2) A multi-criteria e-flow and ecosystem services assessment tool for local to regional scales
- (3) A set of sustainable e-flow and ecosystem services management strategies

Secondments:

One secondment will be Dr Julia Martin-Ortega at the University of Leeds in the UK. The University of Leeds is a project beneficiary, and Dr Martin-Ortega's research focuses on relationships between society and water systems, and has a strong interdisciplinary and policy-relevance emphasis. This secondment is planned to be at around month 6 with a duration of 4 months.

The second secondment is planned to be with Dr Mark Fletcher from Arup Ltd, UK. Dr Fletcher is responsible for all water and flood risk business activity across Arup. He is also member of the project's advisory panel. This secondment is intended to be in the second year with a duration of 2 months. The main purpose of the stay is the development of applications relevant to water businesses.

Eligibility Criteria:

- * Applicants must not have resided or carried out their main activity in Germany 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 environmental sciences, geography or hydrology, or geo-/environmental informatics and be highly motivated to work in an international team including frequent travel between the Euro-FLOW beneficiaries and project partners.
- * Experience of data analysis and statistics (preferably in R), hydrological and water quality modelling as well as of GIS are also required. Programming skills in Python are advantageous.
- * 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 and German 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 Professor Martin Volk; martin.volk@ufz.de for further information; follow the link below to apply for the position

<https://recruitingapp-5128.de.umantis.com/Vacancies/1228/Description/2?customer=5128>

Closing date: 31 December 2017

Post start date: February/ March 2018