Postdoctoral Position at the Laboratory of Alpine Ecology (Grenoble Alpes University, France)

Modelling greenhouse gas emissions from drying river networks

We invite applications from highly motivated candidates for a 24-months postdoctoral position based at the Laboratory of Alpine Ecology (LECA, Université Grenoble Alpes, France ; https://leca.osug.fr/) in collaboration with the EcoFlowS lab (Inrae, Lyon, France). This position is funded by and part of the EU H2020 project DRYvER (Securing Biodiversity, Ecological Integrity & Ecosystem Services in Drying River Networks, www.dryver.eu).

Scientific context

River networks are among Earth's most threatened hot-spots of biodiversity and provide key ecosystem services (e.g. supply drinking water and food, climate regulation) essential to sustaining human well-being. Climate change and increased human water use are causing more rivers and streams to dry, with devastating impacts on biodiversity and ecosystem functioning. Over half the global river network consist of drying channels but drying river networks (DRNs) have received little attention from scientists and policy makers, and the public is unaware of their importance.

River networks play pivotal roles in processing carbon from terrestrial origin, yet how drying alters ecosystem functions related to carbon cycling is poorly known at the local scale and unexplored at the network scale. Recent studies suggest that drying phases alter many carbon-related ecosystem functions (e.g. stream metabolism, leaf litter decomposition) and have legacy effects for subsequent wet-phase processing. Growing evidence also suggest that cycles of alternating dry and wet conditions trigger substantial greenhouse gas emissions, which could challenge current global estimates of how much inland water contribute to greenhouse gas emissions.

The EU H2020 project DRYvER models the response of carbon-related ecosystem functions in DRNs, namely greenhouse gas emissions, and underlying processes such as decomposition of terrestrially derived dissolved and particulate organic carbon, ecosystem respiration and gross primary production. To achieve a mechanistic description of ecosystem functioning in DRNs with predictive capacity, DRYvER exploits a dynamic meta-system framework that accounts for the dynamics of organic carbon resources, their transport and processing, along with the relationships with biodiversity and particular key species.

Postdoctoral research project

The successful candidate will propose a methodological framework to identify and assess the relative contribution of abiotic and biotic controls on GHG emissions and will apply this framework to GHG emissions rates collected in 6 DRNs and multiple hydrological seasons across Europe. The aim is to produce climate-driven scenarios of GHG emissions for these 6 DRNs and then to upscale them at the European scale.

The candidate will collect data from to 2 DRNs (France and Finland) across 3 hydrological seasons. In parallel through a collaboration with two other research teams (University of Innsbruck UIBK and University of Cantabria UC-IHC), data from 4 additional DRNs will be collected. Fieldwork in the DRyVER project involve also the acquisition of targeted ecological functions (ecosystem metabolism

and organic matter decomposition) using harmonized protocols. To complement in-situ GHG emissions measures, the postdoctorate will also conduct respiration measurements in the laboratory using standardized assays on sediments collected across all DRNs and hydrological seasons.

Requirements

The successful applicant will be based at the Laboratory of Alpine Ecology (LECA, Grenoble Alpes University) in Grenoble, France. He/she will organise and lead the field experiments to 2 DRNs, one in France and one in Finland, and conduct respiration measurements in the laboratory. The monthly salary is in the range 2 to 2.7k€ depending on experience. The position is available for 24 months and should start in February/March 2021. A Ph.D in ecology or biogeochemistry is required at the time of appointment. Applicants must have a solid background in ecology and biogeochemistry, and outstanding skills in the organisation and leading of GHG measurements, modelling and statistical analysis. Excellent oral and written communication skills will be preferred.

Application

To apply, please send by email a cover letter stating your research accomplishments and interests, curriculum vitae, representative publications, and the names and contact information for three references to: Dr. Arnaud Foulquier (arnaud.foulquier@univ-grenoble-alpes.fr) and Dr. Thibault Datry (thibault.datry@inrae.fr). Review of applications will begin in December 2020 and continue until the position is filled.