



PhD offer

Quantification of noise pollution and boating activity in the largest natural French lake (Lac du Bourget) using passive acoustic monitoring

Description

Alpine lakes are a strategic resource for the Auvergne-Rhône-Alpes (AURA) region (France) with strong economic, social and ecological concerns. Their attractiveness and ecological integrity are priorities for managers. The rise of tourism, recreational boating and fishing leads to an increase in boat traffic, promoting conflicts between users. The resulting noise can disturb people looking for authentic experiences and alter the biology of patrimonial and endangered species. The first aim of the project is to develop an innovating approach of passive acoustic monitoring to quantify boating activity and noise, both underwater and on the bank, throughout the year and at larger spatial scales. We'll place aquatic and terrestrial recorders at various locations that differ in terms of anthropic pressure. Video recording systems placed on the bank will help us make the association between an acoustic signal and a type of boat. Prior to long-term recording, the listening area will be determined during a propagation experiment. We expect spatiotemporal heterogeneity in the soundscapes with a strong increase in background noise level in the areas under high anthropic pressure. We also expect to find specific acoustic signature depending on boat type, speed or engine. The second aim is to investigate the consequences of repeated exposure to boat noise on the biology of two emblematic fish of the lake Bourget: Arctic Char (*Salvelinus alpinus*) and Perch (*Perca fluviatilis*). We'll plan experiments in the fishery of the INRAE biological station at Thonon-les-Bains and directly in the lake (use of *in-situ* mesocosms and artificial nurseries). We expect alterations in behaviour that might affect reproductive success. In case of habituation, these responses should weaken after repeated exposure.

Supervisor and host laboratory

Vincent Médoc: Equipe de Neuro-Ethologie Sensorielle, ENES/CRNL, CNRS UMR 5292, University of Saint-Étienne, 23 rue du Dr Michelon, 42023 Saint-Étienne Cedex 2, France

Recommended skills

A significant part of the work will be devoted to signal processing. Skills (or at least interest) in related areas (programming, algorithmic, computer science) are therefore important. A background in aquatic ecology, fish biology and acoustic is welcome. The applicant will be part of an interdisciplinary team and must be able to work independently (in the lab and in the field) with a proactive approach and creativity.

Application

Send your CV and cover letter to:
vincent.medoc@univ-st-etienne.fr
before October 31, 2020