



MSc Project

Transport and decay of environmental DNA in rivers

We are looking for an enthusiastic MSc student who will experimentally test hypotheses related to the decay and transport of environmental DNA in rivers and what that means for predicting species distributions (based at Eawag, Dübendorf).

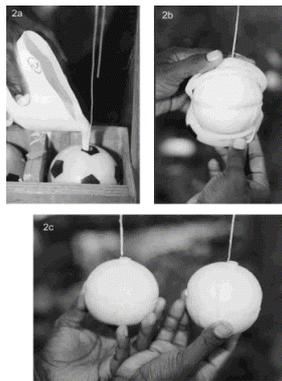
Rationale: Recent work has shown that environmental DNA (eDNA) can be used to detect target species and entire communities present in aquatic habitats. However, the transport and decay of eDNA with water flow across river networks complicates the prediction of species distributions from these data. We have developed a model that accounts for this decay, but direct empirical tests of these predictions are lacking.

Project work: In this MSc project you will develop laboratory and field experiments to directly release and capture artificial eDNA molecules and compare their detection and quantification to model predictions. In particular, you will evaluate the feasibility of using high density gypsum blocks with embedded synthetic DNA for slowly releasing artificial eDNA into a river. In a first phase, the design of gypsum blocks will be tested on laboratory settings (e.g. flumes, ponds); subsequently, these eDNA releasing blocks will be put to the proof in a river. qPCR methods will be used to detect the artificial DNA in eDNA samples downstream from the release sites.

Requirements: Interest in ecology and biodiversity, ability to design pilot experiments for method feasibility, some familiarity with statistical computing, and valid driver licence (requires field work with a car) would be essential requirements. Experience in working in a molecular lab would be an additional asset. The MSc project can start any time.



Species distribution map



eDNA releasing block



eDNA sampling

Contact/Supervision:

Prof. Dr. Florian Altermatt (florian.altermatt@eawag.ch), IEU, University of Zurich
Dr. Hanna Hartikainen (hanna.hartikainen@eawag.ch), Eawag, Aquatic Ecology, Dübendorf
Dr. Luca Carraro (luca.carraro@eawag.ch), Eawag, Aquatic Ecology, Dübendorf
More info: www.altermattlab.ch

We are looking forward to meeting you!