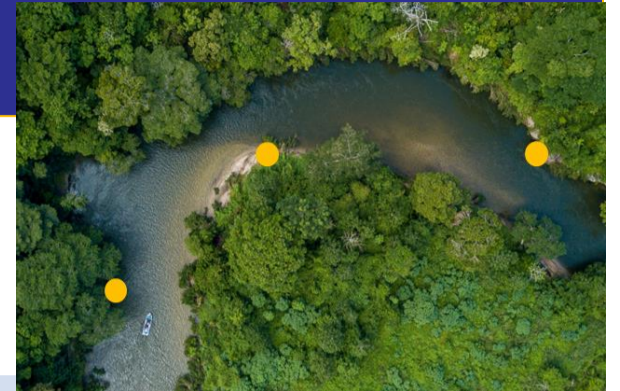


Bachelor's / Master's and semester projects

eDNA stratified sampling design with remote sensing

Supervision

Prof. Dr. Loïc Pellissier (Ecosystems and Landscape Evolution, D-USYS)
 Daily Supervision: Shuo Zong
 Starting date: Flexible

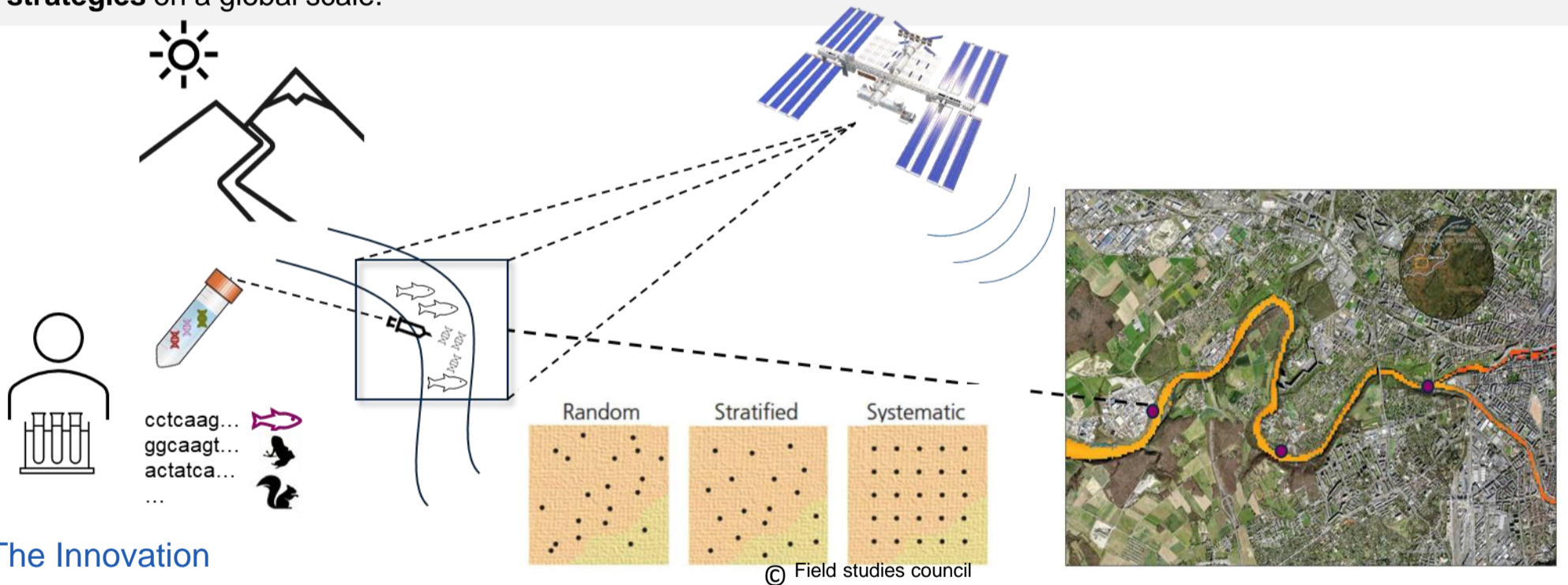


Background

Environmental DNA (eDNA) analysis from rivers shows promise to become a great biodiversity observatory. However, a large fraction of eDNA studies are not making proper sampling plan before going to the field. An appropriate sampling methodology is the key to getting most information we can gather from eDNA sampling campaigns. In river environments, it is common that eDNA studies sample locations at equal intervals or sample based on samplers' insights, which may lead to sub-optimal sampling as regard to the species information collected given that the number of samples is generally limited.

Approach

In this thesis project, we investigate how fine-resolution satellite images can help guide the sampling of biodiversity in large rivers globally, by supporting the planning of eDNA sample collection. We calculate **essential ecological variables** to determine the environmental conditions of the habitat of the species through the implementation of clustering algorithms and predefined thresholds. By utilizing **clustering unsupervised machine learning algorithms** or ecological thresholds, we aim to **develop an open-source tool capable of optimizing stratified eDNA sampling strategies** on a global scale.



The Innovation

Our methodology utilizes **satellite images** to identify and **classify diverse ecological conditions within river habitats**. By systematically mapping ecological preference classes, we empower researchers to design sampling campaigns that capture the full spectrum of species diversity present in a given ecosystem.

The Impact

Through the **integration of satellite imagery and advanced data analysis** techniques, our tool promises to revolutionize eDNA sampling campaigns. By enhancing the efficiency and effectiveness of biodiversity monitoring, researchers can gain deeper insights into river ecosystems and inform evidence-based conservation strategies.

Your profile

Good understanding in Statistics and modeling
 Experience with R or Python

Interested? Contact us:

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