

Department of Biology, Chemistry, Pharmacy, Institute of Biology, Theoretical Ecology
Group. www.bcp.fu-berlin.de/en/biologie/arbeitsgruppen/botanik/ag_tietjen

Master and Bachelor Thesis

Forest management effects on the functions of freshwater macroinvertebrate communities

How land use affects functional traits (feeding guild, body size) and functioning (e.g., respiration rates) of freshwater macroinvertebrates?

If you are interested in these questions, then our DFG-funded project 'LandUseMultBEF' within the Biodiversity Exploratories Program (www.biodiversity-exploratories.de) might be the right place for your MS or BS project. Project website: <https://www.biodiversity-exploratories.de/de/projekte/entflechtung-der-auswirkungen-der-flaechennutzung-auf-verschiedene-dimensionen-der-struktur-und-funktionsweise-multitrophischer-oekosysteme/>

We offer a number of topics (see page 2) for Master and Bachelor Projects

Background: To forecast the ecosystem responses to land use we require a mechanistic understanding of how community structure and ecosystem functions across trophic levels in food web constrain one another. This project aims at integrating network modelling with the field data to assemble food webs and their energy and C:N dynamics for multiple tree holes — the natural models of the temporal freshwater ecosystems, sampled in the Biodiversity Exploratories.

To assemble these food webs we will perform a number of field sampling and lab work. We will measure the species specific traits and functional rates of macroinvertebrates collected across the tree holes in forest plots of the Biodiversity Exploratories, including their body size, body C:N, respiration rates, feeding (using molecular sequencing of gut content).



Your tasks may include (depending on the topic you may chose):

- Sampling the invertebrates in tree holes in forests in the Biodiversity Exploratories
- Identification of the invertebrates
- Preparing and processing samples in the lab
- Lab measurements of the invertebrate body size, respiration rates, DNA metabarcoding
- Data analysis in R (with our help)

Expected profile:

- Study Biology or any other relevant subject
- Ability to perform sampling in field and in lab
- Motivation and willingness to sample in the field (if required by the topic you chose)
- The work will be carried out in English
- Experience working with aquatic communities of invertebrates is an advantage
- A driver's license is an advantage (only for fieldwork project), but not necessary
- Experience with the statistical software R is beneficial

We offer the following topics:

1. Forest management effects on body size distribution of freshwater macroinvertebrates in forest tree holes

This project aims to assess how land use type and intensity affects the ranges of body size in communities of freshwater macroinvertebrates inhabiting the tree holes in these forests. Student will participate in the field-work sampling campaign (together with the other team members) in forests of [the Biodiversity Exploratories](#), in species identification and laboratory measurements of species body length and body mass. The expected dates for the field sampling is April – beginning of May, 2024.

2. Metabolic efficiency (respiration rates) of freshwater macroinvertebrates in tree holes

This project aims to assess the respiration rates for the macroinvertebrates species in the tree-hole communities in forests of different forest management intensities in [the Biodiversity Exploratories](#). Student will participate in the field-work sampling campaign (together with the other team members), in species identification and laboratory experiments with the living individuals, by measuring their respiration rates and of body mass. The expected dates for the field sampling is April – beginning of May, 2024.

3. Feeding guilds of freshwater macroinvertebrates in tree holes

This project aims to assess the gut content for the macroinvertebrate species (with the main focus on predators) in the tree-hole communities in forests of different forest management intensities in [the Biodiversity Exploratories](#). Student will carry out a metabarcoding analysis on several individuals of each species. For this project a previous knowledge and experience in PCR is an advantage. No field work is required, but you are welcome to participate in the fieldwork if you are interested in.

There are also other options and combinations among these topics. If you have questions and if you are interested in doing your project with us, please do not hesitate to contact Silvia López Guerra (silvia.lopez.guerra@fu-berlin.de) and Dr. Oksana Buzhdygan (oksana.buzh@fu-berlin.de).

For our other projects see:

<https://twitter.com/OBuzhdygan>

https://www.bcp.fu-berlin.de/en/biologie/arbeitsgruppen/botanik/ag_tietjen/People/wissenschaftliche_mitarbeiter/Buzhdygan/index.html