

# Rebecca Oester

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## RESEARCH INTERESTS

- I am fascinated by nature's ingenuity and diversity of multifaceted life strategies and interactions.
- Studying aquatic and terrestrial biodiversity, I have developed a particular interest in community ecology and food-web dynamics of arthropods on land and water.
- Driven by curiosity, I am eager to better understand how species dynamically interact with their environment and to share this enthusiasm for biodiversity in nature with others and especially the next generation of scientists.

## EDUCATION

2020-present	<b>University of Zurich/ SUPSI/EAWAG, PhD program in Ecology</b> Thesis: "The Role of Riparian Forests for Aquatic-Terrestrial Linkages, Ecosystem Functions, and Biodiversity in Stream Food Webs" (supervised by Dr. Andreas Bruder, Prof. Dr. Marcelo Moretti, and Prof. Dr. Florian Altermatt) <ul style="list-style-type: none"><li>• Performing field experiments and observations in the riverine zone in Switzerland</li><li>• Species identification multiple taxonomic groups</li><li>• Investigating biodiversity patterns and trophic interactions between riparian plants, fungi, algae, and arthropods</li></ul>
2018-2020	<b>ETH Zurich, Teaching Certification in Environmental Sciences</b> Focus: Ecology and Evolution Assignment: "Protecting wild bees at forest edges" (supervised by Prof. Dr. Christina Colberg) Internship: Biology at the high school Lucerne (supervised by Andreas Meier)
2017-2020	<b>ETH Zurich, MSc Environmental Sciences</b> Major: Ecology and Evolution Thesis: "The influence of fish community on photoprotective compounds of copepods" (supervised by Dr. Blake Matthews) <ul style="list-style-type: none"><li>• Conducting a field survey in Greenlandic ponds with differing food-web configurations</li><li>• Analysing top-down and bottom-up effects in natural food webs</li></ul> Internship: Gutwasser GmbH Zurich, "Macroinvertebrates in the Vjosa river network" (supervised by Prof. Dr. Jukka Jokela) <ul style="list-style-type: none"><li>• Morphologically determining aquatic insects to genus (and species) level</li><li>• Performing field work in mountainous terrain including kick-sampling and sweep nets</li></ul>
2016	<b>Lancaster University, Exchange semester with SEMP/ERASMUS+</b> Major: Environmental Biology Assignment: "Causes for global pollinator decline" (supervised by Dr. Andy Wilby)
2014-2018	<b>ETH Zurich, BSc Environmental Sciences</b> Major: Environmental Biology (Focus: Botany) Thesis: "Vegetative and sexual reproduction of <i>Ranunculus ficaria</i> as influenced by different environmental factors" (supervised by Dr. Sabine Güsewell)

## WORK EXPERIENCE

- 2020 **Gutwasser GmbH**, Project manager
- Designing and executing biodiversity monitoring programs
- 2019 **Eawag Kastanienbaum**, Research assistant in the department of fish ecology
- Collecting limnological data from lakes
- 2018 **WSL Birmensdorf**, Field assistant in the department of social sciences
- Surveying people's perception of forests and their functions
- 2017-2019 **Eawag Dübendorf**, Lab assistant in the department of aquatic ecology
- Dissecting snails and extracting their parasites under the microscope
- 2017 **WSL Birmensdorf**, Field assistant at NFI (National Forest Inventory)
- Measuring morphological traits of trees across Switzerland
- 2012 **WSL Birmensdorf**, Intern in diverse research groups

## TEACHING EXPERIENCES

- 2021-2023 **University of Zurich**, Microbial Ecology (MSc and BSc level)
- Organising field trips and morphological identification of diatoms and fungi
- 2021-2023 **University of Zurich**, Animal Behaviour (BSc level)
- Supervision of students on study design, data collection, data analysis, and scientific writing
- 2021 **Eawag Dübendorf**, Limnoecology (MSc and BSc level)
- Supervision of student projects
- 2020 **High school Lucerne**, Biology
- Introduction to ecology and evolution
  - Organising field trips to assess plant and insect diversity
- 2018-2019 **ETH Zurich**, Vegetation Ecology (BSc level)
- Introduction to field-based assessment of community ecology and biodiversity

## PROJECT SUPERVISION

- 2023 The influence of riparian vegetation and food web configuration on food web properties
- Elizabeth Kotnik, MSc (pre-thesis)
- 2021 Biodiversity effects in leaf litter decomposition
- Katherine Waller, Julia Bernet (research project in Limnoecology)
- 2021 Cotton strip tensile strength in forested and non-forested stream sections
- Jessica Colombo, MSc (internship)
- 2021 Characterisation of macroinvertebrate communities in four streams in Ticino, Switzerland
- Mathilde Laurent, BSc (internship)
- 2021 Exploring land-use impacts on biodiversity and on organic matter processing in freshwater ecosystems
- Laura Thomas-Sleiman, BSc (internship)

## ORGANISATIONS

Co-founder and current president of the Swiss association for aquatic ecologists

Committee member in the Swiss society for limnology and hydrology

## PUBLICATIONS

- Oester, R.**, F. Keck, M. S. Moretti, F. Altermatt, A. Bruder, V. Ferreira. *In prep.* A global synthesis on land-cover changes in watersheds shaping freshwater detrital food webs.
- Oester, R.**, P. M. de Omena, L. Corteletti da Costa, M. S. Moretti, F. Altermatt, A. Bruder. 2024. Biodiversity and riparian forests are mutual biological drivers of ecosystem functions in temperate and tropical streams. *Proceedings of the Royal Society B: Biological Sciences: Under review.*
- Oester, R.**, F. Altermatt, A. Bruder. 2024. Riparian forests shape trophic interactions in detrital stream food webs. *Functional Ecology: In press.*
- Oester, R.**, P. C. dos Reis Oliveira, M. S. Moretti, F. Altermatt, A. Bruder. 2023. Leaf-associated macroinvertebrate assemblage and leaf litter breakdown in headwater streams depend on local riparian vegetation. *Hydrobiologia* 850: 3359-3374.
- Oester, R.**, R. Greenway, M. Moosmann, R. Sommaruga, B. Tartarotti, J. Brodersen, B. Matthews. 2022. The influence of predator community composition on photoprotective traits of copepods. *Ecology and Evolution* 12:e8862.
- Oester, R.**, A. Frei, E. Birnstiel. 2021. Erstfund von *Potamophilus acuminatus* (Fabricius, 1792) für die Schweiz (Coleoptera, Elmidae). *Entomo Helvetica*: 141–144.
- R. Shipley, **R. Oester**, M. Mathieu-Resuge, T. Preet Parmar, M. J. Kainz, D. Martin-Creuzburg, M. K. Obrist, C. H. Graham, M. M. Gossner, B. Matthews, C. W. Twining. 2024. Arthropod biodiversity increases organic nutrient availability across freshwater and terrestrial ecosystems. *Science: In press.*
- Keck, F., T. Peller, R. Alther, C. Barouillet, R. Blackman, E. Capo, T. Chonova, M. Couton, L. Fehlinger, D. Kirschner, M. Knüsel, L. Muneret, **R. Oester**, K. Tapolczai, H. Zhang, F. Altermatt. 2024. The global human impact on biodiversity. *Nature: In review.*
- Ferraz, M., R. S. Rezende, P. M. de Omena, L. Corteletti da Costa, R. Oester, A. Bruder, M. S. Moretti. 2024. How do upstream deforestation and nonnative crop leaves affect leaf breakdown and aquatic invertebrate assemblages? An in situ experiment in streams across mosaic landscapes. *Freshwater Biology: In revision.*
- De Omena, P. M., L. Corteletti da Costa, P. C. dos Reis Oliveira, **R. Oester**, A. Bruder, M. S. Moretti. *In prep.* Stream biodiversity and functioning benefits from forest fragments in agricultural landscapes.
- Kong, Z. H., M. Stangl, **R. Oester**, S. Rehnstam, M. Futter, M. Bundschuh, B. McKie. *In prep.* Polypropylene medical mask waste: effects of macroplastic and microplastic exposure on freshwater leaf and cotton decomposition in the field.
- Perrelet, K., V. Moser, B. Drost, **R. Oester**, F. Altermatt et al. *In prep.* Global change affects the magnitude and spatiotemporal dynamics of resource flows between aquatic and terrestrial ecosystems.
- Martini, J., S. Bequiraj, M. Bresseur, **R. Oester**, L. Talluto, F. Walther, O. Wilfling, V. Zizka, G. Singer, and S. Vitecek. *In prep.* A free-flowing metacommunity: a case study in the Vjosa River network.

Ger, A., A. Abonyi, J. Allen, S. Berger, S. Langenheder, A. Oprei, **R. Oester**, M. Striebel et al. *In prep.* Global synthesis on the effects of warming on aquatic resource use efficiency.

Feijen, F., K. Widmer, **R. Oester**, N. Tardent, K. Klappert, J. Jokela. *In prep.* Frequency of multiple-genotype infections as an indicator of exposure risk in a natural host population.

Feijen, F., N. Tardent, N. Weissert, **R. Oester**, J. Jokela. *In prep.* Mating system analysis of a co-transmitting, cyclically clonal, hermaphroditic parasite.

Moosmann, M., R. Greenway, **R. Oester**, B. Matthews. 2024. The role of fish predators and the foraging traits in shaping zooplankton community structure. *Ecology Letters* 27:e14382.

Brasseur, M. V., J. Martini, O. Wilfling, R. Wüthrich, E. Birnstiel, **R. Oester**, V. M. A. Zizka, G. Singer, F. Leese, S. Vitecek. 2023. Exploring macroinvertebrate biodiversity in the dynamic southern Balkan stream network of the Vjosa using preservative-based DNA metabarcoding. *Aquatic Sciences* 85:51.

Martini, J., F. Walther, T. Schenekar, E. Birnstiel, R. Wüthrich, **R. Oester**, B. Schindelegger, T. Schwingshackl, O. Wilfling, F. Altermatt, M. V. Talluto, G. Singer, S. Vitecek. 2023. The last hideout: Abundance patterns of the not-quite-yet extinct mayfly *Prosopistoma pennigerum* in the Albanian Vjosa River network. *Insect Conservation and Diversity* 16: 285–297.

#### LAB AND FIELDWORK SKILLS

#### SOFTWARE SKILLS

Lab	Molecular	R	Broad knowledge of statistical analyses and modelling in Bayesian and frequentist framework through experiences in theoretical and applied contexts Deepened knowledge on problem solving techniques especially through courses focussing on community ecology and diverse applications in data analysis (incl. mixed-effect models, structural equation models and network analyses)
	<ul style="list-style-type: none"> <li>• DNA extractions</li> <li>• PCR</li> <li>• Genotyping</li> <li>• HPLC handling</li> </ul>		
Field	Wet lab		
	<ul style="list-style-type: none"> <li>• Microscopy</li> <li>• Dissections</li> <li>• Stable isotope analyses</li> <li>• Stoichiometric analyses</li> </ul>	ArcGIS	Profound knowledge of displaying and analysing geographic information using a broad set of tools taught by a course focussed on application
	Terrestrial		
	<ul style="list-style-type: none"> <li>• Mountainous terrain</li> <li>• Grasslands</li> <li>• Forests</li> <li>• Driver's license Cat. B</li> </ul>	imageJ	Essential skills of analysing visual data from microscope and camera pictures
	Aquatic	InkScape	Figure making and conceptual visualisation of scientific results, concepts in ecology and evolution, and teaching material
	<ul style="list-style-type: none"> <li>• Lakes</li> <li>• Rivers</li> <li>• Streams</li> <li>• PADI scuba diver</li> </ul>		

## AWARDS

- 2023 **Best poster** at SME8, Swiss Microbial Ecology Meeting, Switzerland
- 2022 **Best oral presentation** at PLPF9, Plant Litter Processing in Freshwaters, Portugal
- 2021 **Most active participant** at SEFS12, Symposium for European Freshwater Sciences, Ireland
- 2019 **Best poster** at CEEB, Conservation, Ecology, Evolution and Biogeochemistry, Switzerland

## EXTERNAL FUNDS

- 2023 **SCNAT**, 2000 CHF for network events on macroinvertebrate experts
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## SCIENTIFIC COMMUNITY ACTIVITIES

- 2024 **WBF24**, co-convening the session on aquatic-terrestrial linkages and food webs
- 2024 **Seminar series**, hosting Prof. Dr. Peter Manning (University of Bergen)
- 2024 **Seminar series**, hosting Dr. Christine Weber (Eawag Kastanienbaum)
- 2023 **Seminar series**, hosting Prof. Dr. Brendan McKie (Swedish University of Agricultural Sciences)
- 2023 **Biodiversity convention**, co-leading two sessions on aquatic-terrestrial biodiversity
- 2022 **PhD Symposium**, organising a full day of presentations by PhD students from the Aquatic Ecology Department at Eawag and three invited speakers:  
Prof. Dr. Antoine Guisan (University of Lausanne), Prof. Dr. David Aldridge (University of Cambridge), and Dr. Francesca Cesari (Springer Nature)
- 2021 **SFS21**, moderating the session on community ecology and positive interactions

## INVITED TALKS

- 2024 **University of Hamburg**, Germany, Department of Zoology
- 2023 **University of Uppsala**, Sweden, Department of Aquatic Sciences and Assessment
- 2022 **University of Innsbruck**, Austria, Department of Ecology

## LANGUAGES

- German Native
- English Excellent
- French Conversational
- Italian Conversational
- Dutch Conversational
- Spanish Beginner

## REVIEWING ACTIVITY

- Arthropod Plant Interactions
- Ecological Monographs
- FEMS Microbiology Ecology
- Fundamental and Applied Limnology
- Hydrobiologia