



“Field Course in Biodiversity Assessment and Monitoring” (UWW210)

August 14th to 19th 2022 – Empächli, Elm (Canton of Glarus)

Dear participants of the field course,

Biodiversity is one of the most outstanding features of our planet, yet strongly threatened. In this course, we will go to a highly biodiverse location in the Alps, and learn about biodiversity, identify plants and animals, and study how biodiversity can be assessed and monitored in a representative manner. Eventually, all of you will have the opportunity to do a small research project on biodiversity.

The course is open for UZH students of the programs UWW, BIO and ESS, primarily targeting students starting in the respective MSc programs in fall 2022 (more information and registration with Claudia Hegglin, see further below).

Here we want you to give some information about the content of the course and the goals and logistics. We are all very much looking forward to the course and seeing you there!

Best wishes,

Dr. Roman Alther Roman.Alther@eawag.ch

Prof. Dr. Florian Altermatt

Prof. Dr. Owen Petchey



@roman_alther

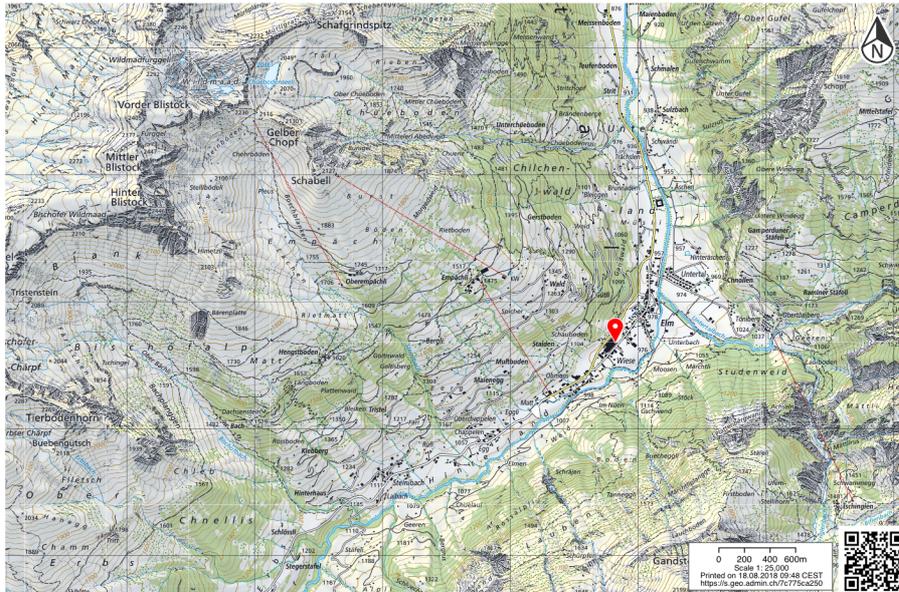
@altermatt_lab

@OwenPetchey

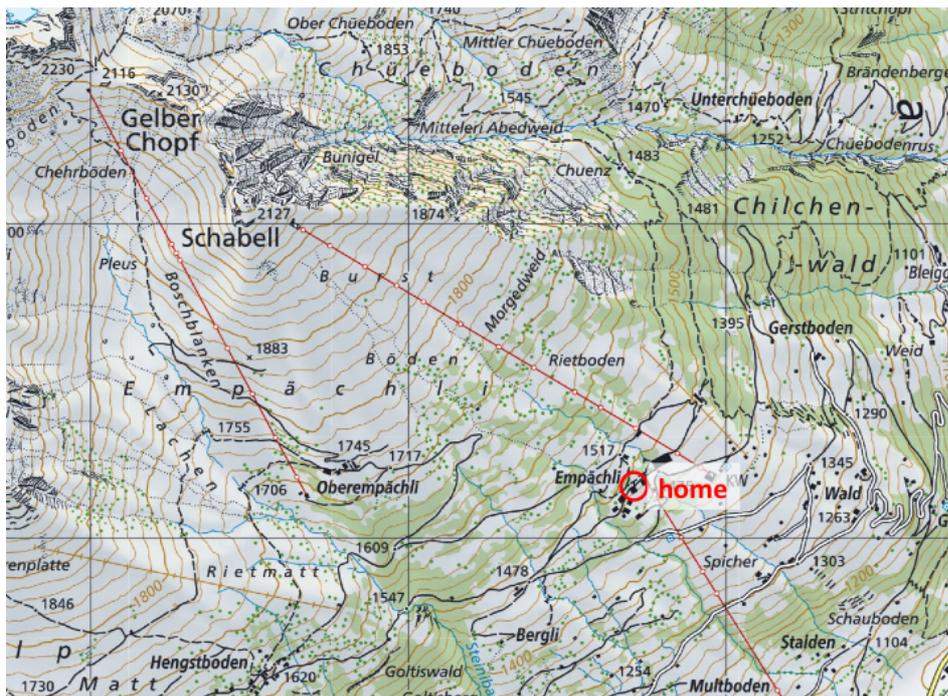
Note: the following description and course details are provisional and may change depending on updated COVID-19 measures (e.g., mandatory masks, reduced number of participants, recommendations on vaccination). Updates and final information will follow in early summer.

1. General

The course takes place at Empächli (GPS: coordinates 46° 55' 09" N, 9° 09' 00" E), which is located in Canton of Glarus near Elm. Empächli is a typical former “summer residence” of farmers in the Alps, now converted to a tourist/ski place.



Empächli is located at 1500 m a.s.l., and is surrounded by beautiful alpine meadows, conifer forests, alpine scrublands and peaks reaching above 2200 m a.s.l. All study sites/excursions will be accessible during hikes of 1–3 hours.



Getting there:

We will go by train from Zurich (take the train scheduled below at 14:12 from Zurich HB; take train to “Elm, Sportbahnen”). If you arrive from elsewhere, we meet the latest at bus/Cable car stop (“Elm Sportbahnen”) on Sunday August 14th at 16:00 (Bus/train from Zurich arrives 15:53), and then translocate to the field course site “Empächli” by cable car. See schedule below. We travel together, but everybody has to organize their tickets themselves! (back and forth, take the ticket to “Elm, Sportbahnen”, Tickets for cable car are organized and provided by us). Please be on time. We meet at the front of the train (direction of travelling).

Station/stop	Time		Travel with	Information
Zürich HB	dep 14:12	Gl. 10	IR 35 2371	InterRegio 35 Richtung: Chur FS (X) R Aare Linth
Ziegelbrücke	arr 14:58	Gl. 9		
				Change
Ziegelbrücke	dep 15:03	Gl. 10	S 6 11649	S-Bahn 6 Richtung: Schwanden GL
Schwanden GL	arr 15:24	Gl. 3		
				2' Walk
Schwanden GL, Bahnhof	dep 15:28		B 541 21	Bus 541 Richtung: Elm, Sportbahnen
Elm, Sportbahnen	arr 15:53			

Duration: 1 h 41 min

2. Goals of the course

As a typical alpine location, Empächli/Elm is characterized by diverse alpine ecosystems such as snowfields, rock surfaces, meadows, pastures, forests, lake, wetlands, or bogs, which are right at the doorstep and will be visited during the week.

The overall aim of the course is to give an introduction into the assessment and analysis of biodiversity patterns. These skills are a prerequisite for many basic and applied research questions dealing with biodiversity. In the field, you will learn how to identify plant species and assess associated trait measures. Participants will further learn various techniques of invertebrate sampling. Subsequently, students will identify the collected invertebrates in the laboratory and analyse the data.

2.1. Content of the course

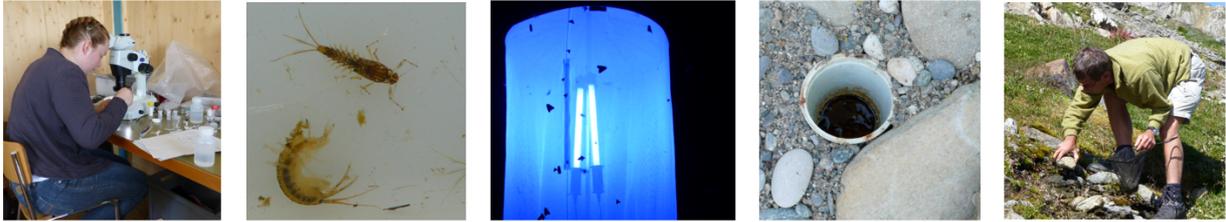
For practical purposes, the most urgent need in protecting biodiversity is to assess how biodiversity is distributed in space and how it changes over time. Because biodiversity is not homogeneously distributed, its measurement is difficult and requires a multitude of tools and methods. For example, flowering plants may easily be counted but butterflies are constantly moving and may be hard to see when a site is being visited. Different groups of invertebrates, which play an important role in all ecosystem and food webs, must be collected with specific means (e.g., transect counts, pit falls, light traps, kicknetting) and identified appropriately. Good statistical design of assessment and monitoring programs maximizes accuracy for a given cost.

This field course will give you firstly an introduction into a highly diverse alpine ecosystem with the goal of learning the most important species and species groups and secondly a practical overview on how to assess biodiversity for different taxonomic groups.

By the end of the course, you should:

- Be able to plan, conduct and present small research projects on current topics in ecology and biodiversity sciences.
- Know and have applied different field techniques to monitor biodiversity of different taxa (such as terrestrial insects, plants, aquatic invertebrates).
- Be familiar with the most important aspects of planning and conducting biodiversity monitoring.
- Have a first overview on the faunistics and identification of some of the characteristic species of a few

major taxonomic organismal groups (such as plants, butterflies, aquatic invertebrates) and be able to represent this knowledge in a field note book.



Course requirements

The course can be attended by UWW, BIO and ESS students. It is a compulsory module for master students of the Specialized MSc Program in Quantitative Environmental Science (UWW), but also open to BIO and ESS students at an adequate level (generally end BSc/beginning MSc). UWW students must take this course in the first semester of their MSc program (exception must be requested in written at least 8 weeks before the course starts).

The course can accommodate up to 24 students, and priority is given to students from the new cohort of UWW master students. However, past experience shows that only about half of the available slots are taken, and the remaining slots are open for ESS and BIO students. BIO and ESS students can register any time (register with Claudia.Hegglin@ieu.uzh.ch) and are put on a waiting list. Their definite admission will be decided latest 8 weeks prior to the course.

2.2. Program

The general working plan from Monday to Thursday includes breakfast (07:30 to 08:30), 08:30 start of the daily work (field and lab work), lunch in the field or in the house, 18:30 dinner, 20:00 evening lectures or lab work. The tentative daily schedule is given below.

Important note: The program of the week is subjected to changes and depends on the progress in the field/ lab and the actual weather conditions.

Sunday, August 14

Afternoon: 16:30 arrival of participants;
Installation of lab facilities

Evening: Introduction lecture given by Florian Altermatt [*topics covered: habitats and taxonomic groups at Empächli, presentation of available tools and methods, how to do field notebooks/species lists*]

Monday, August 15

All day: Excursion 1 on alpine habitat types, alpine plants, and alpine animals. We do a longer (several hours) hike, passing through important alpine habitats, and will stop to do several “BioBlitz” at different habitats, focusing on plants, terrestrial insects and aquatic macroinvertebrates. Collect organisms for later identification. Also look for species interactions and the unseen biodiversity.

- Get an overview on the local diversity
- Assemble an “all-days species list”
- Start discussion about possible research projects

Evening: Lecture by Owen Petchey [*topics covered: statistical analysis, sampling methods, biodiversity monitoring*].
Formation of working groups, think about possible projects

Tuesday, August 16

Morning: Excursion 2 on alpine habitat types: how to representatively sample and monitor biodiversity? Do applied monitoring and sampling of plant biodiversity, and insect biodiversity.

Afternoon: Plan own small research project (in groups of 2–3 students)

Evening: Presentation of planned projects to everybody
Lab work and identification of organisms

Wednesday, August 17

Morning: Work on research projects and collect data

Afternoon: Work on research projects and collect data / Lab work and identification of organisms

Evening: Lab work and identification of organisms

Thursday, August 18

Morning: Analyse data from research projects

Afternoon: Data Analysis; start writing posters/presentations

Evening: Writing posters/presentations. Course evaluation.

Friday, August 19

Morning: Presentations of research projects

Afternoon: House cleaning and departure

2.3. Reporting/Grading

A prerequisite for the granting of the credit points is active participation, conducting oral and/or written short presentations, and short quizzes. All evaluations will be conducted within the course. The grading will be based on the individual field note books (1/3 weight) and the conductance and presentation of the research project (2/3 weight). Two credit points will be given for a successful participation in the course.

3. Accommodation

3.1. Housing

We stay at “Lagerhaus Empächli”. Don’t expect a 5-star hotel! There are rooms of different sizes with 4 to 8 beds that will be shared by all students. You need to bring a sleeping bag and towel.

There is no advanced laboratory infrastructure in the Skihaus Empächli, but we can do some simple lab work in one of the two kitchens/living rooms which will be also used as a lecture room. A projector (for computer presentations) is available. If possible, bring your own laptop for the work during the week. The valley is covered by Swisscom, so you should be able to use your mobile phones. There is low speed WiFi.



3.2. Meals

The house is equipped with a kitchen and vegetarian food will be prepared for us! Breakfast (self-service) and dinner will always be at the house. For lunch, we either do a picnic style lunch or eat at the house. We expect the help of all participants for kitchen work (e.g. cutting vegetables, doing the dishes) during the week and help cleaning the kitchen, labs, toilets, showers, and the bedrooms before leaving.

If you have specific dietary restrictions, please let us (Claudia Heggin) know at least 6 weeks ahead.

5. Material to bring along

We will be in an alpine environment, and you have to be prepared to any type of weather (including snowfall!). We will do multiple excursions, and are out for several hours to all day long. Good outdoor clothes and shoes in which you can hike in alpine environments are recommended.

- **good clothes for warm and sunny weather**
- **good clothes for cold and rainy weather** (raincoat and warm jacket), we are in an alpine environment with potentially lots of precipitation)
- umbrella
- **good sturdy shoes**
- UV protection (sunglasses, sun lotion and hat)
- flash light
- ear plugs (shared bedrooms...)
- Towel
- **Sleeping bag**
- **Bedlinen (Fixleintuch und Kopfkissenbezug)**
- Slippers (shoes for inside the house, "Finken")
- back-bag for daily excursion
- drinking water bottle
- box/bag for taking out lunch to the field (e.g., Tupperware box)
- binocular
- Swiss army knife
- Laptop → have R installed
- Digital camera (for taking pictures of organisms we observe during the week)
- Hand lens for plant/insect identification
- **Field-notebook/pencil for taking notes in the field**
- Transparent **scotch tape** for adding plants to your field notebook
- If you have, identification books for plants and invertebrates (see also recommended literature below)



6. Costs

Each student contributes (presumably) 150 CHF to the expenses for the food during the week (full board: breakfast, lunch, dinner, ...and snacks in between). For your info: This amount does not cover all the costs, and the department (IEU) will cover the remaining costs. There are no shops nearby, but there is a restaurant just next door. You have to bring along all extras (food, beverages etc.) you might use during the week yourself.

Bring along the 150 CHF in cash, we will collect the money at the beginning of the course.

Travelling costs need to be covered individually by the participants.

7. Staff

Prof. Dr. Florian Altermatt (Modulverantwortlicher, Professor of Aquatic Ecology, on sabbatical leave)
University of Zurich, Department of Evolutionary Biology & Environmental Studies

Dr. Roman Alther (Docent, Senior Research Assistant, Aquatic Ecology)
Eawag and University of Zurich, Department of Evolutionary Biology & Environmental Studies
roman.alther@uzh.ch

Prof. Dr. Owen Petchey (Docent, Professor of Predictive Ecology)
University of Zurich, Department of Evolutionary Biology & Environmental Studies

Dr. Frank Pennekamp (Docent, Independent group leader, Biotic Responses to Environmental Change)
University of Zurich, Department of Evolutionary Biology & Environmental Studies

Mara Knüsel (Assistant, PhD student in ecology)
Eawag and University of Zurich, Department of Evolutionary Biology & Environmental Studies

In addition, we will have some individual guests during the week.

For **registration** and questions regarding the UWW program in general:

Claudia Hegglin (UWW Coordinator)
University of Zurich, Department of Evolutionary Biology & Environmental Studies
claudia.hegglin@ieu.uzh.ch

8. Additional Info

Maps

<https://map.geo.admin.ch/?topic=bafu&lang=en&bglayer=ch.swisstopo.pixelkarte-farbe&E=2733396.87&N=1194682.97&zoom=6>

House

<http://www.ssc-schwanden.ch/skihaus.html>

Recommended literature to bring along

Lauber K, Wagner G, Gygax A (2018) Flora Helvetica. 6th edition. Haupt Verlag, Bern. 1686 p.



Chinery M (2004). Pareys Buch der Insekten. Kosmos Verlag (there is an English version of this book too: Chinery M (2012) Insects of Britain and Western Europe. Domino Guides.).

