



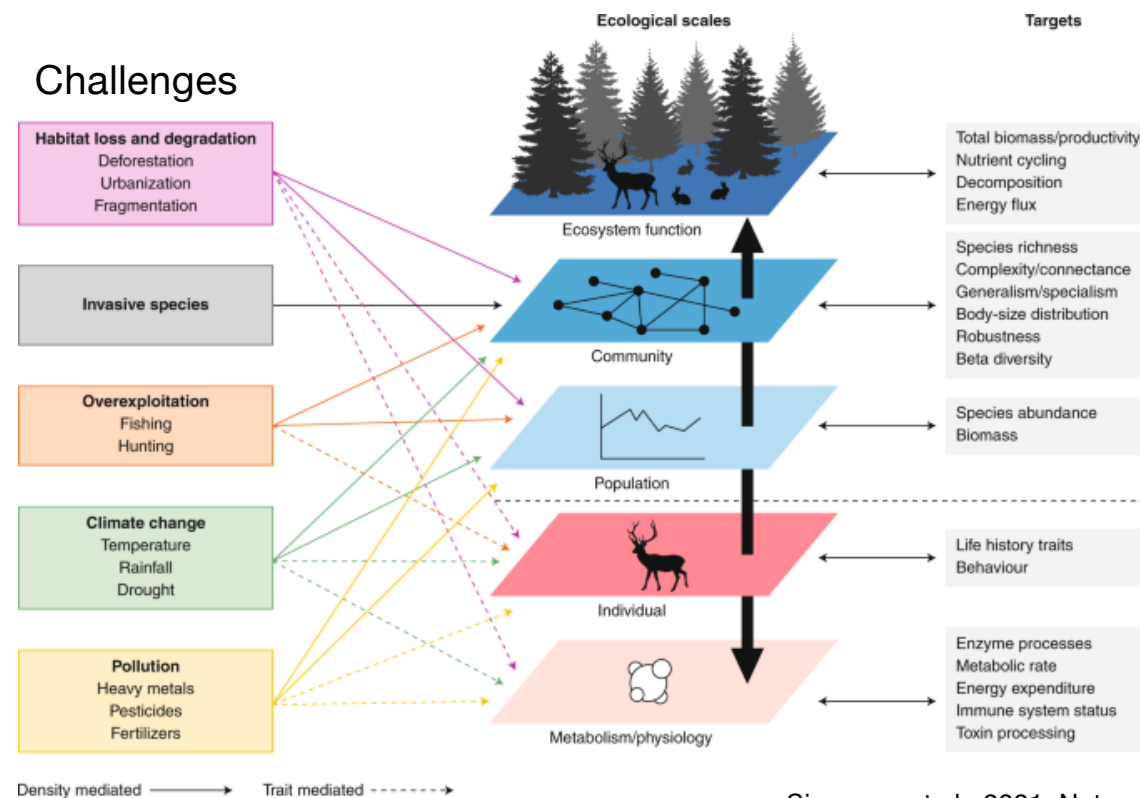
Master Environmental Sciences and Engineering

Applied Ecology

Introduction

Applied Ecology

Applied ecology = the application of the science/concepts of ecology to real-world (usually management) questions.

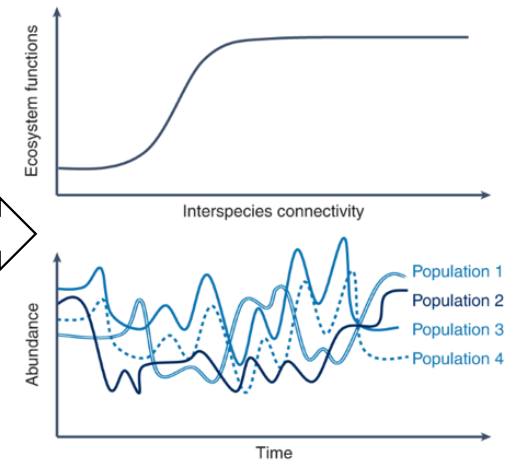


Simmons et al., 2021; Nature

Applied Ecology

Applied ecology = the application of the science/concepts of ecology to real-world (usually management) questions.

- Effective management of natural ecosystems depends on ecological knowledge.
- Applied ecologists use observation, experimentation and modelling.



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Example of applications:

- Agro-ecosystem management
- Biodiversity conservation
- Ecosystem restoration
- Environmental engineering
- Invasive species management
- Protected areas management
- Wildlife management



Why should we manage ecosystems?



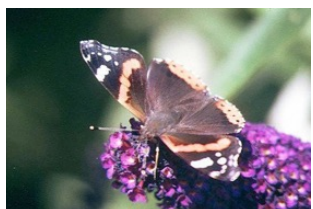
food production



slope stability



fire prevention



biodiversity



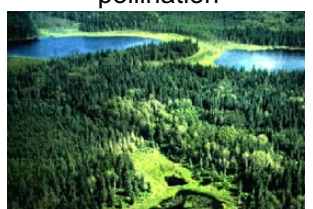
pollination



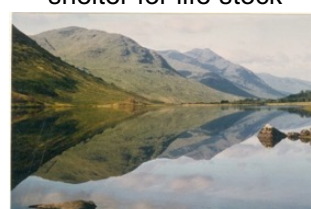
shelter for life stock



fodder production



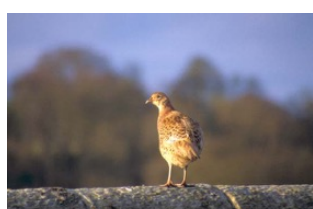
carbon sequestration



water storage



tourist attraction



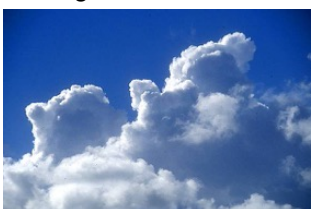
game reserve



fibre production



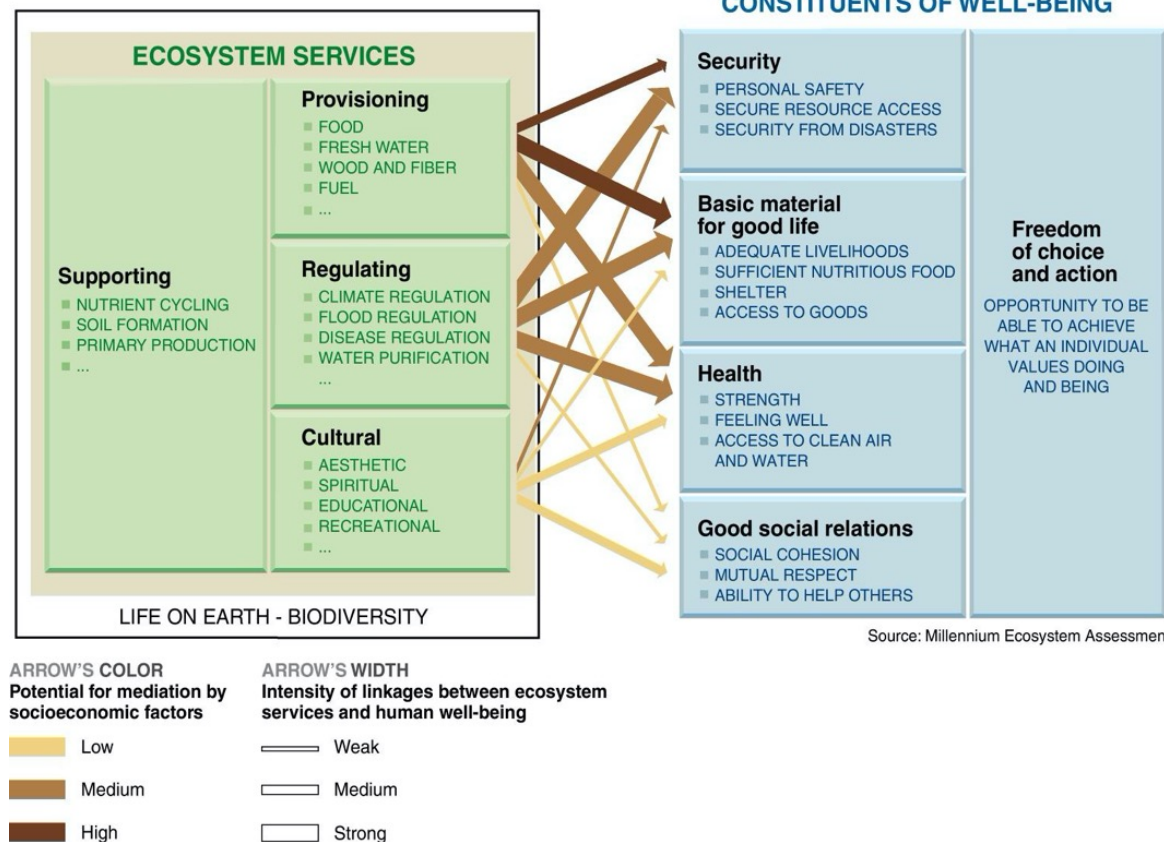
recreation



stabilising micro-climate



inspiration



Objectives of this lecture

- (1)** Discuss and analyze real-world cases
- (2)** Conduct fieldwork to determine the importance of biodiversity on ecosystem multifunctionality
- (3)** Participate in field excursions and interact with applied ecologists

Objectives of this lecture

(1) Discuss real-world cases

- **12 groups of 4–5 students** will work on a case study, which they will have to present at the end of the lecture in front of the class. Each group will have a specific role during the presentation and during the discussion. All groups have to ask questions and participate in the discussion of the other groups.

Objectives of this lecture

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→ Register on Moodle this week

▼ Restrict answering to this time period

☒ Restrict answering to this time period

Open

10 ▾ September ▾ 2024 ▾ 12 ▾ 00 ▾ 📅

Until

17 ▾ September ▾ 2024 ▾ 12 ▾ 00 ▾ 📅

Choice	Group Show descriptions	Members / Capacity	Group members Show Group Members
☐	Group 1 Case 1: Forest and fire, impact on the local water resources of a mega city	0 / 6	
☐	Group 2 Case 1: Forest and fire, impact on the local water resources of a mega city	0 / 6	
☐	Group 3 Case 2: Superblocks in Barcelona: How to improve urban green spaces	0 / 6	
☐	Group 4 Case 2: Superblocks in Barcelona: How to improve urban green spaces	0 / 6	
☐	Group 5 Case 3: The great green wall of China: strategies for a successful dryland restoration	0 / 6	
☐	Group 6 Case 3: The great green wall of China: strategies for a successful dryland restoration	0 / 6	
☐	Group 7 Case 4: Human-made rewilding experiment and the feedback to local fauna	0 / 6	
☐	Group 8 Case 4: Human-made rewilding experiment and the feedback to local fauna	0 / 6	
☐	Group 9 Case 5: How should we manage the wolf?	0 / 6	
☐	Group 10 Case 5: How should we manage the wolf?	0 / 6	
☐	Group 11 Case 6: Managing the invasion of the windmill palm in Switzerland	0 / 6	
☐	Group 12 Case 6: Managing the invasion of the windmill palm in Switzerland	0 / 6	

Objectives of this lecture

(1) Discuss real-world cases

Case #1: Forest and fire: impact on the local water resources of a mega city



Case #2: Superblocks in Barcelona: How to improve urban green spaces



Case #3: The great green wall of China, consequences for local economies and climate feedback



Objectives of this lecture

(1) Discuss real-world cases

Case #4: Human-made rewilding experiment and the consequences for local fauna



Case #5: Reintroduction of the wolf



Case #6: Managing the invasion of the windmill palm in Switzerland



Objectives of this lecture

(1) Discuss real-world cases

- **12 groups of 4–5 students** will work on a case study, which they will have to present at the end of the lecture in front of the class. Each group will have a specific role during the presentation and during the discussion. All groups have to ask questions and participate in the discussion of the other groups.
- **Grading of the presentation (50% of the total grade with a 50/50 ratio for individual/group performance):** Students will be evaluated on the quality of the slides, especially their clarity, the quality of the research they did to develop their case, the quality of the expression and the participation in the discussion of other groups. Students will also receive feedbacks from their peers after the presentation.
- **Deadline:** Send your presentations to the teachers (with your names) on the day of your presentation latest.

Case #1: Forest and fire, impact on the local water resources of a mega city



Some context: Melbourne is a growing city with increasing water demand. Though not located in an arid region, water is a highly critical resource and strong droughts and forest fires caused water levels in the reservoirs of the nearby forested mountainous regions (the main water supply for the city) to strongly decrease.

The role of the group(s): You are responsible for the long-term planning of the water supply for Melbourne. Your task is to recommend a strategy that considers the continuity of water supply, and its sustainability, but also the other functions and services of the ecosystems in the catchment areas.

Other groups will be representing diverse citizen groups of Melbourne

The teachers will be representing the Melbourne officials taking the decision on which strategy to implement

Case #2: Superblocks in Barcelona: How to improve urban green spaces



Some context: Due to continued urbanisation, cities are becoming larger and denser, and heat up compared to the rural surroundings. Urban green spaces are considered a sustainable solution to ameliorate the urban climate. In densely populated Barcelona, city officials have tried to implement an innovative concept to make the city more livable: Superblocks. However, the project has recently been stopped...

The role of the group(s): You will be acting as urban planners of Barcelona developing a follow-up concept of the Superblocks by taking into consideration the difficulties that led to its stop.

Other groups will be representing local residents (elderly, parents, shop owners), people relying on cars (supplier, manufacturer), tourists.

The teachers will be representing the officials of the city government that will implement the project.

Case #3: The great green wall of China: strategies for a successful dryland restoration



Aforestation efforts in the Mu Us Desert. (Photo: Baijitan Nature Reserve)

Some context: Drylands worldwide have seen an increase in use by humans for food production, expansion of urban areas, etc. This has led to the degradation of drylands around the globe. In northern China, degradation of drylands increase the problem of regular sandstorms that affect large areas in north-east Asia. China has therefore started a huge aforestation program in the 70's to prevent desertification. With mixed success...

The role of the group(s): You will be acting as scientists that try to improve the aforestation project, learning from past mistakes, adapting and presenting current strategies.

Other groups will be representing local contractors (farmers), concerned residents, and environmental activists.

The teachers will be representing the officials of the local government that oversees the aforestation project.

Case #4: Human-made rewilding experiment and the feedback to local fauna



Some context: In the first year of the establishment of the Oostvaardersplassen reserve, a dense willow grove rapidly developed, reducing the value of the habitat. To avoid this, park managers have introduced large herbivores. Many herbivores died during the 2017-2018 winter due to insufficient food. In the face of protests, two-thirds of the red deer population had to be preemptively slaughtered.

The role of the group(s): You are responsible for the decisional measures, maintenance, and monitoring of the reserve.

The other groups represent ecologists, animal rights defenders, local inhabitants.

The teachers will be the provincial authorities in charge of final decisions.



Case #5: How should we manage the wolf?



Some context: Around the 20's century, the wolf (*Canis lupus*) has suffered from a deliberate human prosecution, reducing its range to about one-third of its original range. The local eradication of the wolf's population has caused significant impacts in ecosystems since the wolf is considered a key species. Nonetheless, the wolf's reintroduction in some rural areas has caused conflict between wolves and humans.

The role of the group(s): In this case study, the students play the role of a park manager and must decide whether to reintroduce the wolf. Their decision must be argued and followed by specific plans to cope with potential challenges the introduction or non-introduction may cause.

Other groups: will defend the interests of the local population and animal rights groups.

The teachers will be representing local authorities, deciding the fate of the land .

Case #6: Managing the invasion of the windmill palm in Switzerland



Some context: The windmill palm is native to Southeast China and was imported into Europe in the early 1800s as an ornamental plant. In southern Switzerland (Tessin), this species is appreciated and widely planted in individual gardens. The windmill palm is a symbol of the tropics and vacations and is largely used to promote tourism in the region. Unfortunately, since the 2000s, the species has spread in natural ecosystems due to global warming. The spread of the windmill palm in forests leads to a decrease in the regeneration of native species. It also increases landslides, rockfalls, and wildfires risk and magnitude.

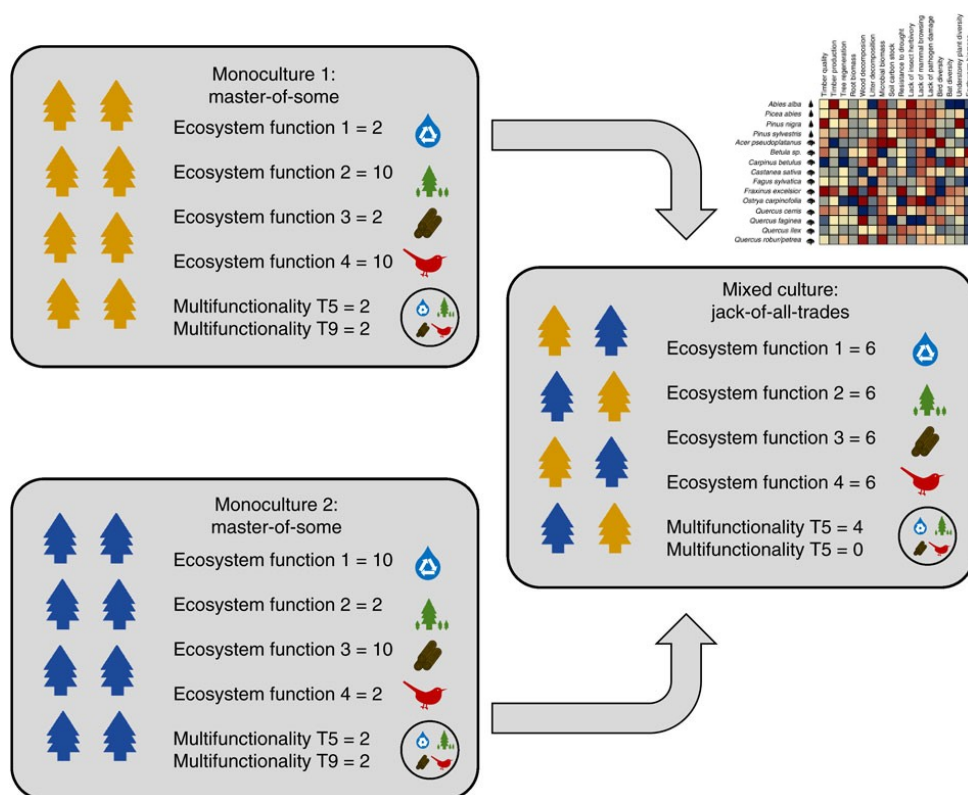
The role of the group(s): You will recommend a strategy allowing to reduce the number of individuals in the natural forests, as well as protecting and restoring the biodiversity and the ecosystem services of the invaded forests (wood production, landslides protection).

The teachers will represent the local authorities

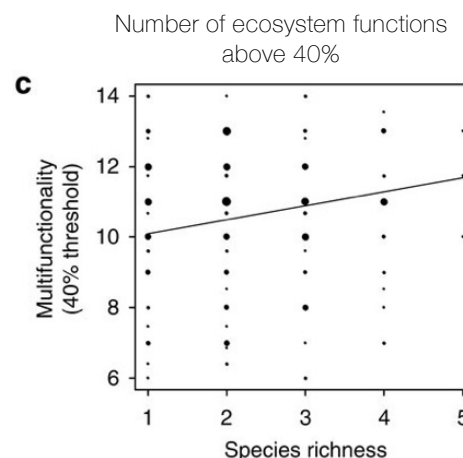
The other groups will defend the interests of the population and the tourism agencies

Objectives of this lecture

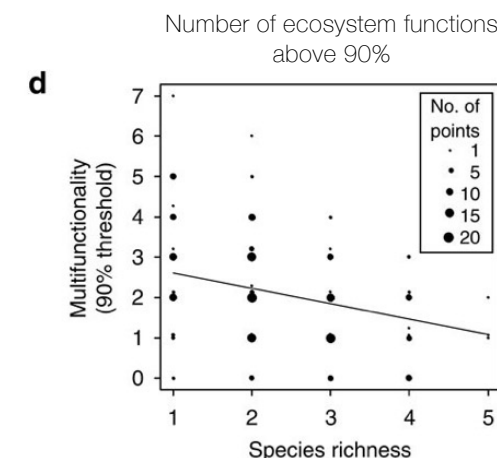
(2) Conduct a field comparison of ecosystem services provided by a monoculture vs. a diverse forest



Diverse tree communities are jack-of-all-trades but master-of-none



Tree diversity can promote multifunctionality at intermediate levels



Tree diversity reduces multifunctionality at high levels

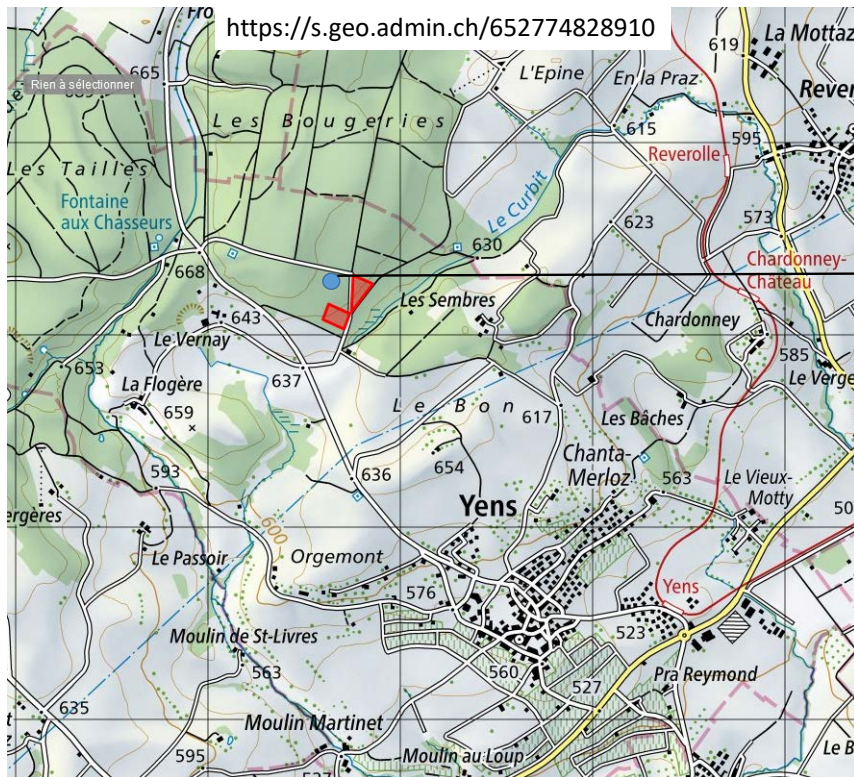
Objectives of this lecture

(2) Conduct a field comparison of ecosystem services provided by a monoculture vs. a diverse forest

- **Fieldwork:** You will work in 2 forested sites: 1 tree plantation vs. a natural forest with limited intervention. Students will measure multiple ecosystem services, including a biodiversity index (IBP) and the amount of wood produced. At the end of the fieldwork, you will prepare a report in groups (same groups as in Task #1).

Objectives of this lecture

(2) Conduct a field comparison of ecosystem services provided by a monoculture vs. a diverse forest

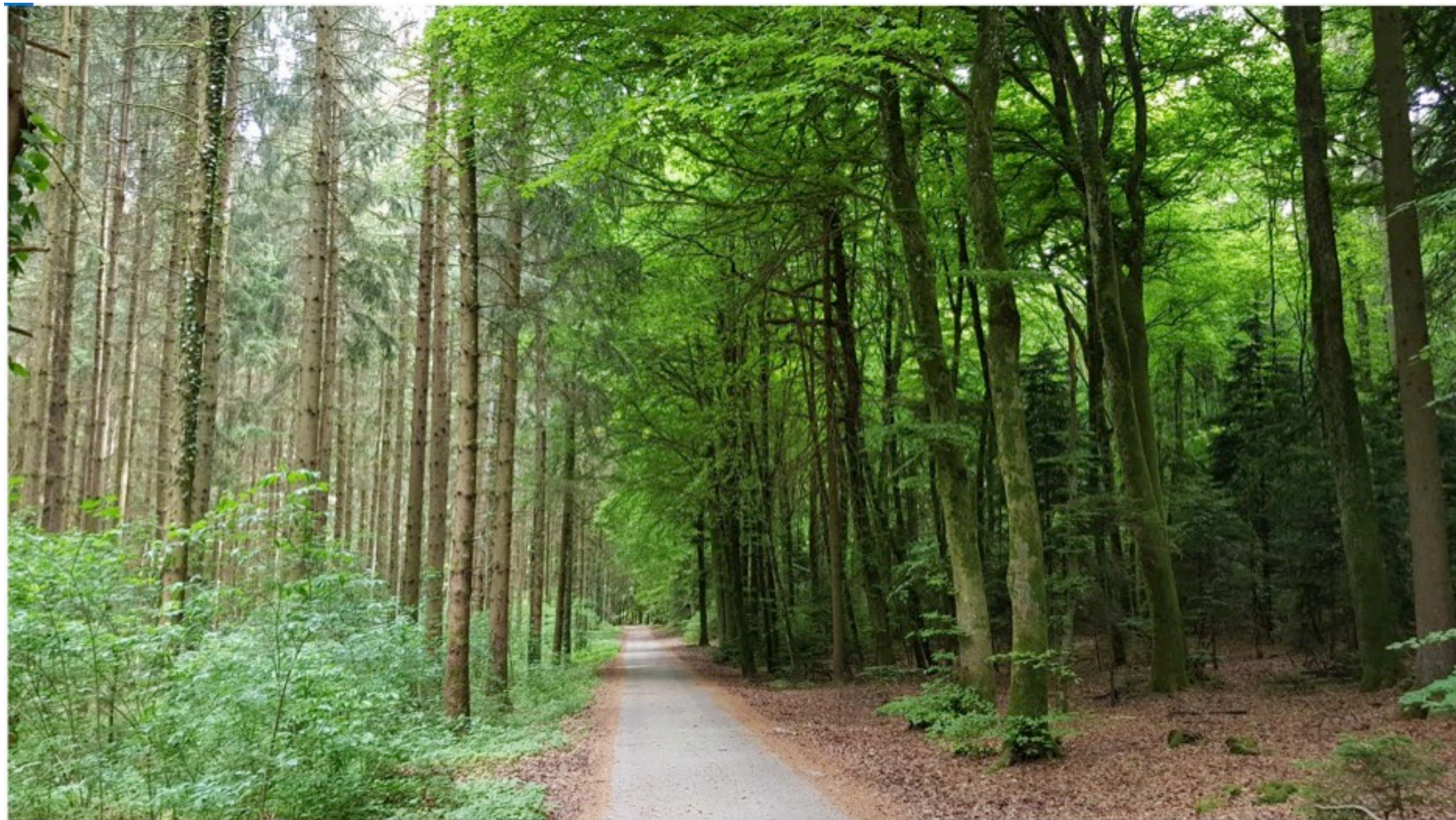




The plantation site



The “natural” forest



Objectives of this lecture

(2) Conduct a field comparison of ecosystem services provided by a monoculture vs. a diverse forest

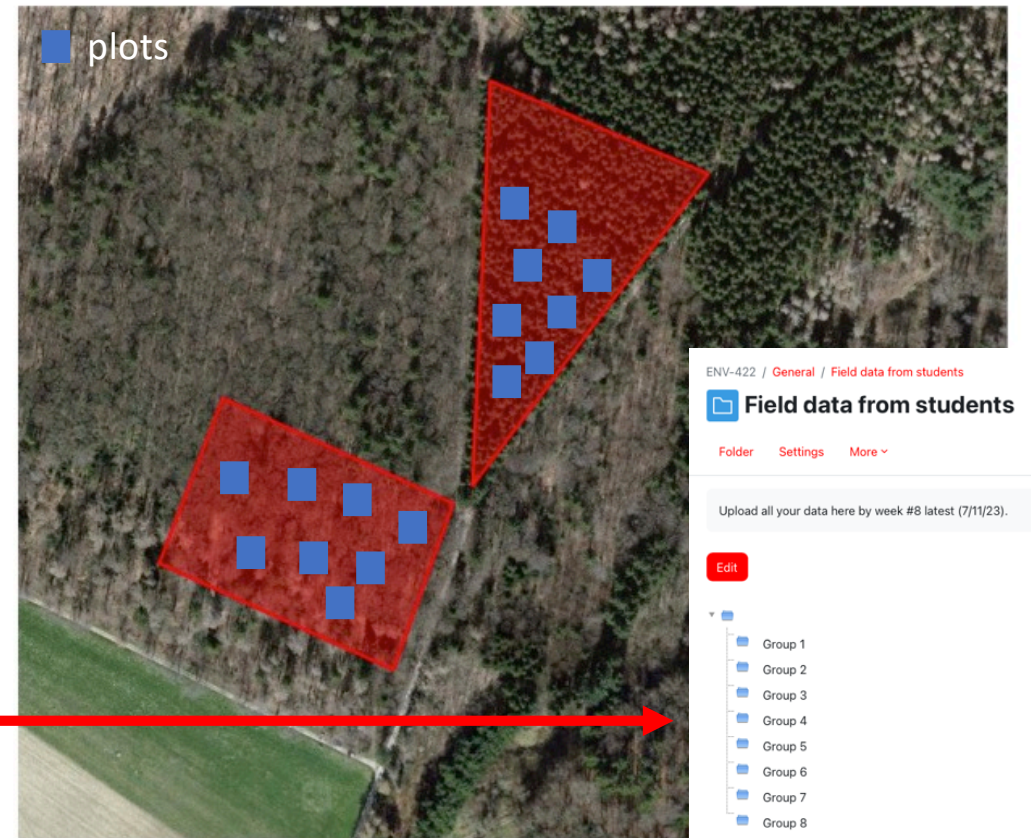
- Potential biodiversity indice (IBP)
- DBH, tree height and density/number of trees
- Aboveground wood production
- Soil pH & plot LAI
- Presence of dendro-microhabitats
- Social aspects of ecosystem services



- read the files on Moodle
- Come prepared for fieldwork

Objectives of this lecture

- All groups will select 1 plot of 10 x 10 m in each forest type (2 plots per group in total)
- Measurements will take place over two days
- At the end of the work, all students will upload their data on Moodle so that all students can use them for the analyses (to increase sample size)



Objectives of this lecture

(2) Conduct a field comparison of ecosystem services provided by a monoculture vs. a diverse forest

- **Grading of the report (50% of the total grade with 50/50 ratio for the whole group and your individual contribution to the work):** You will be evaluated based on the description of the context (literature review), the presentation of the methods and results (methods and results are separated parts) and the discussion (use the literature to place the results in a wider context by explaining the consequences of the results).
- The report should not exceed 7 pages, excluding the references, and should not have more than 4 figures.
- In the report, students need to explain their individual contribution.
- Deadline: **Latest the last day of the course**, you need to send your reports to the teachers

Go on Moodle for further information

Environmental Sciences and Engineering (SIE) / SIE - Master

Applied ecology

Course Settings Participants Grades Reports More ▾



This course is currently **hidden**. Only enrolled teachers can access this course when hidden. You can change the visibility in the **course settings**.

▾ General

[Collapse all](#)

Summary

The course will provide the ecological systems' knowledge needed to question applied sustainability solutions. We will critically assess the complexity of current environmental issues, illustrating basic ecological concepts and principles.

The course combines elements of a classic lecture, group discussions, problem-based learning, and fieldwork. Our central aim is to balance participants' respect for complexity with a sense of possibility by providing examples from the vast solution space offered by ecological systems, such as e.g. green infrastructure to manage water. The class will include two excursions where the students will have the opportunity to discuss critical ongoing problems faced by environmental managers.

Keywords

applied ecology, resource management, forest ecosystems, trees, community ecology, species interactions, ecosystem functions and services, biodiversity, climate change

Evaluation

- 50% Oral presentation and discussion of a case study in a group (**only presentation, no report**)
- 50% Written report of a field study in the same group (**deadline: December 19th, 2023**)



Announcements



Group Choice



Practical resources Applied Ecology



Evaluation of oral presentations

▾ 10 September - Introduction (CHB330)

▾ 17 September - Cases 1, 2 and 3 (CHB330)

▾ 24 September - Cases 4, 5 and 6 (CHB330)

▾ 1 October - Excursion 1 in Lausanne

▾ 8 October - Fieldwork 1 (Yens)

▾ 15 October - Fieldwork 2 (Yens)

▾ 22 October - Holidays

▾ 29 October - Labwork (GR B2 423)

▾ 5 November - Excursion 2 in Suchy

▾ 12 November - Guest presentation Agroscope + data analyses (CHB330)

▾ 19 November - Excursion 3 at EPFL + data analyses (CHB330)

▾ 26 November - Excursion 3 at EPFL + data analyses (CHB330)

▾ 3 December - Report and presentation preparation (CHB330)

▾ 10 December - Student presentations (CHB330)

▾ 17 December - Student presentations (CBH330)

Objectives of this lecture

(3) Participate in three excursions

- **Excursion 1: Urban trees in Lausanne**



Michaël Rosselet, responsable du patrimoine arboré de Lausanne

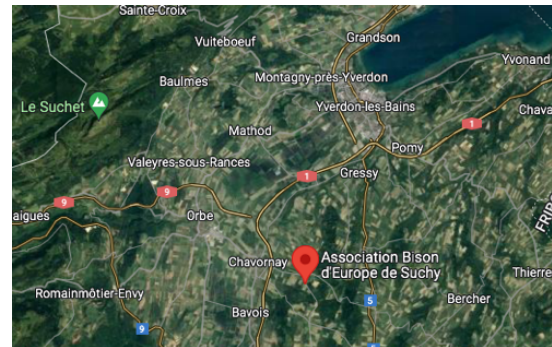
- How to select suitable tree species?
- Experiences from past plantations: what can we keep, what do we need to change?
- Trade-offs of green spaces with other services in the city
- Diversity of urban trees: species and genes
- Habitat trees in the city
- Urban forests
- and more...

Ecoquartier "Plaines-du-loup"

Objectives of this lecture

(3) Participate in three excursions

- Excursion 2: the Bison conservation forest of Suchy



Projet de cellule de conservation du bison d'Europe



Historique et état actuel du bison d'Europe

Préhistoire : Le plus grand mammifère de nos forêts, sa population était très importante.

Moyen-âge : Plusieurs facteurs l'ont contraint à émigrer au nord-est de l'Europe :

déforestation



chasse : viande



braconnage : fourrure, cornes

11^{ème} siècle : Disparition du bison d'Europe du Plateau suisse.

1920 : Suite à la première guerre mondiale, plus que quelques bisons d'Europe dans des zoos.
→ programme d'élevage et de croisement des derniers survivants entre parcs animaliers
→ réintroduction en Pologne

1939-1945 : Seconde guerre mondiale, frein au projet : 30 % de perte.

1952 : Réactivation du projet
Nouveaux lâchers de bisons d'Europe en forêt polonaise et en Biélorussie
D'autres ont suivi en Europe de l'est.

1963 : Liste rouge de l'IUCN (Union Internationale pour la Conservation de la Nature).
Bison d'Europe : «vulnérable».
→ risque d'extinction très élevé à l'état sauvage
→ consanguinité
→ maladie bovines



Aujourd'hui : 3 000 bisons en Europe :
→ 2 000 en liberté (Pologne, Roumanie, Biélorussie ...)
→ 1 000 en captivité dans des zoos ou en semi-captivité (cellules de conservation) dans des réserves ou des parcs

Distribution du bison d'Europe
juste après la glaciation (en jaune)
Au XIII - XV^{ème} siècle (en vert)
Etat actuel (en rouge)



© carte : wikipedia.org

En Europe de l'ouest, il n'y a plus de forêts assez vastes et bien préservées pour permettre à de nouvelles populations de bisons d'Europe de vivre en liberté.

Objectives of this lecture

(3) Participate in three excursions

- Excursion 3: EPFL's thermal power plant



Schedule of the lectures

Date	Time	Topic	Week	Location
10/9/24	8-12h	Introduction	1	CHB 330
17/09/2024	8-12h	Presentation of cases 1, 2 and 3	2	CHB 330
24/9/2024	8-12h	Presentation of cases 4, 5, and 6	3	CHB 330
1/10/24	8-12h	Excursion to Lausanne	4	Lausanne
8/10/24	8-12h	Field work #1	5	Field
15/10/2024	8-12h	Field work #2	6	Field
22/10/2024	HOLIDAYS			
29/10/2024	8-12h	Lab work #1	7	GR B2 423
5/11/24	8-12h	Excursion to Suchy	8	CHB 330
12/11/24	8h30-10h 10-12h	Presentation by Massimiliano Probo (1h30) Data Analyses I	9	CHB 330
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← Today

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Case presentations
CHB 330

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Excursion 1

We meet in Lausanne, Plaine du Loup, Station Bois-Gentil at 08:30

The excursion ends at the Plaine du Loup at 11:30

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Fieldwork

We meet at 7h45 at the bus stop on Avenue Piccard. We plan to be back at EPFL at 12h.



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Labwork

Each group will be assigned a time slot to come to GR B2 423 to conduct their lab work.

The time slots will be available on Moodle in week 4 (once all groups are formed).

All groups need to upload their final data on Moodle by week 9

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5/11/24	8-12h	Excursion to Suchy	8	CHB 330
12/11/24	8h30-10h 10-12h	Presentation by Massimiliano Probo (1h30) Data Analyses I	9	CHB 330
19/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Data Analyses II	10	CHB 330
26/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Work on Presentation & report I	11	CHB 330
3/12/24	8-12h	Work on Presentation & report II	12	CHB 330
10/12/24	8-12h	Student presentations I	13	CHB 330
17/12/2024	8-12h	Student presentations II	14	CHB 330



Excursion 2

We meet at 7h45 at the bus stop on Avenue Piccard. We plan to be back at EPFL at 12h.



Schedule of the lectures

Date	Time	Topic	Week	Location
10/9/24	8-12h	Introduction	1	CHB 330
17/09/2024	8-12h	Presentation of cases 1, 2 and 3	2	CHB 330
24/9/2024	8-12h	Presentation of cases 4, 5, and 6	3	CHB 330
1/10/24	8-12h	Excursion to Lausanne	4	Lausanne
8/10/24	8-12h	Field work #1	5	Field
15/10/2024	8-12h	Field work #2	6	Field
22/10/2024	HOLIDAYS			
29/10/2024	8-12h	Lab work #1	7	GR B2 423
5/11/24	8-12h	Excursion to Suchy	8	CHB 330
12/11/24	8h30-10h 10-12h	Presentation by Massimiliano Probo (1h30) Data Analyses I	9	CHB 330
19/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateform (1.5 h) Data Analyses II	10	CHB 330
26/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateform (1.5 h) Work on Presentation & report I	11	CHB 330
3/12/24	8-12h	Work on Presentation & report II	12	CHB 330
10/12/24	8-12h	Student presentations I	13	CHB 330
17/12/2024	8-12h	Student presentations II	14	CHB 330



Guest presentation by Massimiliano Probo

 **Agroscope**



Followed by dedicated time slot to conduct data analyses

All in CHB 330

Schedule of the lectures

Date	Time	Topic	Week	Location
10/9/24	8-12h	Introduction	1	CHB 330
17/09/2024	8-12h	Presentation of cases 1, 2 and 3	2	CHB 330
24/9/2024	8-12h	Presentation of cases 4, 5, and 6	3	CHB 330
1/10/24	8-12h	Excursion to Lausanne	4	Lausanne
8/10/24	8-12h	Field work #1	5	Field
15/10/2024	8-12h	Field work #2	6	Field
22/10/2024	HOLIDAYS			
29/10/2024	8-12h	Lab work #1	7	GR B2 423
5/11/24	8-12h	Excursion to Suchy	8	CHB 330
12/11/24	8h30-10h 10-12h	Presentation by Massimiliano Probo (1h30) Data Analyses I	9	CHB 330
19/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Data Analyses II	10	CHB 330
26/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Work on Presentation & report I	11	CHB 330
3/12/24	8-12h	Work on Presentation & report II	12	CHB 330
10/12/24	8-12h	Student presentations I	13	CHB 330
17/12/2024	8-12h	Student presentations II	14	CHB 330



Excursion 3 + data analyses

Students will be separated into groups to visit the thermal power plant:

Groups 1, 2, 3, 4, 5, 6 on 19/11 and 7, 8, 9, 10, 11, 12 on 26/11.

We will meet at 8:30 near the pumping stations next to the lake (details will be provided before the excursion).

The other students will have dedicated time slots in CHB 330 to work on data analyses and presentations.

Schedule of the lectures

Date	Time	Topic	Week	Location
10/9/24	8-12h	Introduction	1	CHB 330
17/09/2024	8-12h	Presentation of cases 1, 2 and 3	2	CHB 330
24/9/2024	8-12h	Presentation of cases 4, 5, and 6	3	CHB 330
1/10/24	8-12h	Excursion to Lausanne	4	Lausanne
8/10/24	8-12h	Field work #1	5	Field
15/10/2024	8-12h	Field work #2	6	Field
22/10/2024	HOLIDAYS			
29/10/2024	8-12h	Lab work #1	7	GR B2 423
5/11/24	8-12h	Excursion to Suchy	8	CHB 330
12/11/24	8h30-10h 10-12h	Presentation by Massimiliano Probo (1h30) Data Analyses I	9	CHB 330
19/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Data Analyses II	10	CHB 330
26/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Work on Presentation & report I	11	CHB 330
3/12/24	8-12h	Work on Presentation & report II	12	CHB 330
10/12/24	8-12h	Student presentations I	13	CHB 330
17/12/2024	8-12h	Student presentations II	14	CHB 330

**Final time slot to work on the report
and presentations in CHB 330**



Schedule of the lectures

Date	Time	Topic	Week	Location
10/9/24	8-12h	Introduction	1	CHB 330
17/09/2024	8-12h	Presentation of cases 1, 2 and 3	2	CHB 330
24/9/2024	8-12h	Presentation of cases 4, 5, and 6	3	CHB 330
1/10/24	8-12h	Excursion to Lausanne	4	Lausanne
8/10/24	8-12h	Field work #1	5	Field
15/10/2024	8-12h	Field work #2	6	Field
22/10/2024	HOLIDAYS			
29/10/2024	8-12h	Lab work #1	7	GR B2 423
5/11/24	8-12h	Excursion to Suchy	8	CHB 330
12/11/24	8h30-10h 10-12h	Presentation by Massimiliano Probo (1h30) Data Analyses I	9	CHB 330
19/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Data Analyses II	10	CHB 330
26/11/2024	8h30-10h 10-12h	Excursion EPFL Energy plateforme (1.5 h) Work on Presentation & report I	11	CHB 330
3/12/24	8-12h	Work on Presentation & report II	12	CHB 330
10/12/24	8-12h	Student presentations I	13	CHB 330
17/12/2024	8-12h	Student presentations II	14	CHB 330

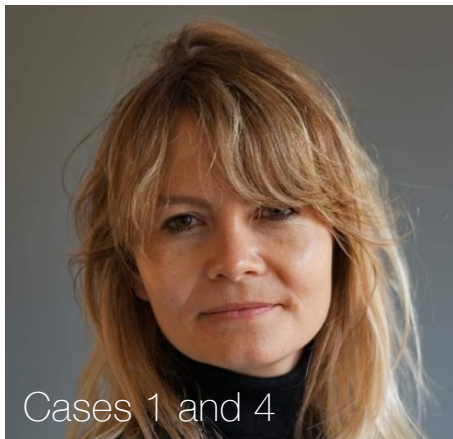
Student presentations in CHB 330

Groups 1, 2, 3, 4, 5, 6 on 10/12
and 7, 8, 9, 10, 11, 12 on 17/12.

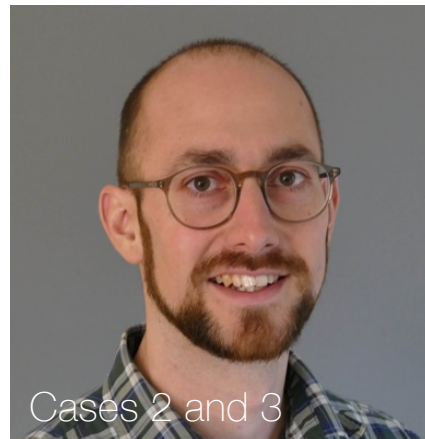


The teaching team

Charlotte Grossiord



Christoph Bachofen



Helena Vallicrosa



Thibaut Juillard



How to prepare the scientific report

Structure of the report

Page 1: Title, name of the students, group # and abstract (max. 200 words). The abstract should say (1) the research conducted, including the rationale, (2) methods, (3) key results, and (4) the main conclusion, including the key points of discussion. It should not contain citations.

Example of a 200 words abstract

Research

New
Phytologist 

Can we predict carbon stocks in tropical ecosystems from tree diversity? Comparing species and functional diversity in a plantation and a natural forest

Maria C. Ruiz-Jaen¹ and Catherine Potvin^{1,2}

¹Department of Biology, McGill University, 1205 Dr Penfield, Montréal H3A-1B1, QC, Canada; ²Smithsonian Tropical Research Institute, Apartado 0843-03092, Balboa, Panama

- Linking tree diversity to carbon storage can provide further motivation to conserve tropical forests and to design carbon-enriched plantations. Here, we examine the role of tree diversity and functional traits in determining carbon storage in a mixed-species plantation and in a natural tropical forest in Panama.
- We used species richness, functional trait diversity, species dominance and functional trait dominance to predict tree carbon storage across these two forests. Then we compared the species ranking based on wood density, maximum diameter, maximum height, and leaf mass per area (LMA) between sites to reveal how these values changed between different forests.
- Increased species richness, a higher proportion of nitrogen fixers and species with low LMA increased carbon storage in the mixed-species plantation, while a higher proportion of large trees and species with high LMA increased tree carbon storage in the natural forest. Furthermore, we found that tree species varied greatly in their absolute and relative values between study sites.
- Different results in different forests mean that we cannot easily predict carbon storage capacity in natural forests using data from experimental plantations. Managers should be cautious when applying functional traits measured in natural populations in the design of carbon-enriched plantations.

Structure of the report

Pages 2-7: Should follow the structure:

- Introduction (state of the art, objectives and hypotheses; use references) *about 1.5 pages*
- Methods (describe methods, sites and statistics briefly so that someone can reproduce the study; you can cite references to avoid describing methods in too much detail) *about 1.5 pages*
- Results (describe the results, including giving the significant differences) *about 1 page*
- Discussion (discuss the results as a whole, use references, explain the meaning of your findings for forest management purposes) *about 2 pages*
- Conclusions (state the main finding and suggest avenues for future work) *about 0.5 page*

--> Include the reference list and annexes after the 7 pages

**See you next week in
the same room as today**

GRB330