Community ecology – theory, experiments and data analyses

Course syllabus, spring 2023

Summary
This course provides fundamental knowledge in community ecology, with a focus on community dynamics and mathematical modelling, experimental- and time series analyses methods to address key questions in community ecology. It also provides some insights in recent advances in community ecology and discussions of lines of research in community ecology.

Expected learning outcomes
After completed course, the students are expected to

(i) be able to explain fundamental concepts in community ecology
(ii) be able to evaluate how their own research relates to community ecology theory
(iii) be able to explain, and discuss, how various ecological processes can influence the dynamics of animal communities
(iv) know of a range of experimental, statistical, mathematical and graphical methods to analyze such community responses
(v) be able to explain and apply a chosen set of methods for community ecology analyses

Credits
5 ECTS/HEC

Course set-up and content
The course consists of lectures including invited lectures from leading researchers in different fields of community ecology, discussion seminar, modelling/data analysis exercises and a short individual project presented at a final mini-symposium. One week of lectures and exercises are held on SLU campus Ultuna, and the other week is held in SLU Öregrund.

Topics covered during the course include

(i) Trophic interactions & community dynamic regulation
(ii) Non-trophic interactions & community dynamics
(iii) Communities & food-webs as interaction networks
(iv) Community structure and stability
(v) Interaction types, population regulation and alternative community states
(vi) Meta-community ecology
(vii) Community assembly
(viii) Diversity, food-web functioning & ecosystem services
(ix) Eco-evolutionary dynamics of communities

Course participants will learn analytical and graphical analyses of community stability, multivariate time series analyses to identify species dependencies and to explain community dynamics, and simple dynamic modelling of community responses to environmental change.

Through discussion seminars, the individual project and the final symposium, the students will also get the opportunity to practice oral presentation, evaluate and discuss how their own research relates to community ecology theory, as well as practice scientific debate.

Literature
Selected sections from Verhoef, H. A. & Morin, P. J. (eds). 2009. Community Ecology. Processes, Models and Applications. Oxford University Press, Oxford. 264 pp. ISBN 9780199228980

Classical as well as more recent key articles in community ecology, provided before the course starts.

Course leader
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Examination
Participation in discussion seminars and exercises, oral presentation and written extended abstract of individual project, participation in final symposium.

Grades: pass or fail

Prerequisities
Admitted to PhD-studies.

Course dates 2023
March 13th-17th (campus Ultuna/SLU Öregrund)
March 27th-31st (SLU Öregrund/campus Ultuna)

This course is part of the SLU Research school *Ecology – basics and applications*.