

Introduction to SDMs: Theory and practice in R

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Sapienza University, Roma

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SDM Course Course schedule R exercises Resources

Intro to SDMs

This short course will include:

- Lectures, readings, and discussions covering basic theory and concepts behind species distribution models (SDMs) and ecological niche models (ENMs)
- Practical experience in acquiring and cleaning species occurrence data, as well as designing, building and evaluating SDM and ENM using a variety of R packages
- Students will gain perspective on the potential applications, strengths, and limitations of SDMs/ENMs

Course participants should have a general understanding of R programming. Participants are welcome (but not required) to join the course with their own data / project ideas. A pre-course reading list and R exercise will be provided after course registration is completed. Questions about the course should be sent to Bob Muscarella robert.muscarella@ebc.uu.se.

[Return to the Muscarella Group homepage](#)

[Visit the Github repository for this course](#)

The figure displays four maps arranged in a 2x2 grid, showing species distribution models for two plant species: *C. microstachya* and *C. pyrifolia*. The top row (A and B) is for *C. microstachya*, and the bottom row (C and D) is for *C. pyrifolia*. The left column (A and C) represents the AICc method, while the right column (B and D) represents the Default method. Each map shows a geographic area with a color gradient representing the probability of species presence, ranging from blue (low probability) to red (high probability). The x-axis for all maps is longitude, ranging from -67.1 to -66.8. The y-axis for *C. microstachya* is latitude, ranging from 18.0 to 18.4. The y-axis for *C. pyrifolia* is latitude, ranging from 18.0 to 18.4. Each map includes a legend on the right side indicating the probability scale. The maps show that for *C. microstachya*, the AICc method (RM=2; FC=LQH) results in a more widespread distribution compared to the Default method (RM=1; FC=LQH). For *C. pyrifolia*, the AICc method (RM=4; FC=LQHP) shows a more localized high-probability area compared to the Default method (RM=1; FC=LQH).

Course website: <https://bobmuscarella.github.io/SDM-course/index.html>

Who am I?

- Associate professor in Plant Ecology & Evolution at Uppsala University
- Tropical forest ecologist, (functional) diversity, forest dynamics, natural and anthropogenic disturbance
- Interest in applying SDMs to understand broader context of diversity patterns, and how species respond to environmental conditions
- Interest in methodological development of SDMs (ENMeval R package)

Course overview

- 3 day short course with emphasis on practical exercises
- General understanding of main concepts + hands-on experience
- Use these days as a spring board for continued learning

Like
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Not
like
this...

Learning objectives

- Familiar with basic theory, concepts, and terminology of SDMs / ENMs
- Design, build and evaluate SDMs / ENMs in R
- Understand the strengths and limitations of SDMs / ENMs
- Use SDMs/ENMs to describe and predict species distributions in space + time



Introductions (~ 2 min each)

- Name?
- Department?
- Year of studies?
- Research project?
- Prior experience with R and SDMs?
- What do you hope to gain from this course?
- Anything else?

HELLO

My name is

A close-up photograph of two small glasses filled with espresso coffee. The glasses are positioned in front of a silver espresso machine. Steam is visible rising from the machine's spout and the top of the glasses. The background is blurred, focusing on the coffee and the machine.

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