R for Macroecological and Global Change Studies

Organizer: Brody Sandel, Ecoinformatics and Biodiversity Group, Department of Bioscience, Aarhus University

Venue: The beautiful Sandbjerg Estate in southern Denmark (http://www.sandbjerg.dk/en/) Sandbjergvej 102, 6400 Sønderborg.

Dates: June 14-20, 2015

Format: An intense, week-long (Sunday-Saturday) course with a mix of lectures and practical exercises.

Supported by: International Research School in Applied Ecology. **Board and lodging** are covered for participants from IRSAE, who may also apply for a mobility grant to cover **travel costs** (see application form at (http://irsae.no/grants/)

Scientific content: As the amount of data available to ecologists grows, more sophisticated tools are needed to extract knowledge from data. The statistical programming language R is well-suited for addressing this challenge, with the capabilities of handling massive datasets, performing the functions of traditional GIS software, and executing spatial analyses.

This course will introduce R, with a focus on aspects of the language that are relevant in the analysis of large spatial datasets. The course assumes no or little prior knowledge of R but will move quickly through introductory topics such as defining functions, plotting and basic statistical tests. With this foundation, we will then introduce more advanced topics related directly to macroecological and biogeographical studies beginning with handling and manipulating vector- and raster-type data. We will then introduce two widely-used methods in spatial macroecology and global change studies – species distribution modeling and spatial regression methods. We will conclude with a small project that integrates the topics covered in the course. Students may bring their own data to analyze in the project if it fits the course themes.

The course will last for one week, with a morning and afternoon class each day. Each class will begin with a lecture, after which students will work on problems in R with guidance from the lecturer. Each student will need to bring a laptop capable of running the latest version of R to each class.

Course schedule

Sunday (June 14):	Arrival at Sandbjerg in the afternoon, welcome dinner
Monday morning:	Introduction to the R programming language
Monday afternoon:	Functions and plotting
Tuesday morning:	Model specification, statistical tests and model selection
Tuesday afternoon:	Multivariate ordination
Wednesday morning:	Spatial data in R
Wednesday afternoon:	Species distribution modeling
Thursday morning:	Spatial regression I: spatial filters
Thursday afternoon:	Spatial regression II: simultaneous autoregressive models
Friday:	Work on projects
Saturday:	Departures

Participation: This course is open to all PhD students. There will be room for a maximum of 15 students in the course, so strong competition for attendance is expected.

Registration: Email a brief description of your PhD project and description of the relevance of the course to your research, along with a CV to Brody Sandel (brody.sandel@bios.au.dk). Deadline March 31, 2015.

AARHUS UNIVERSITY