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Short course on

Recent Advances in Spatial Analysis of Multivariate Environmental Data: Theory and Practice

24 – 28 October 2011

Day 1

0. Introduction to data analysis.
1. Ordination in reduced space: principal component analysis (PCA), principal coordinate analysis (PCoA), correspondence analysis (CA).
2. Transformation of species abundance data tables prior to linear analyses.

Day 2

3. Measures of similarity and distance, especially for community composition data.
4. Multiple regression. R-square, adjusted R-square, AIC.
5. Polynomial regression.
6. Partial regression.

Day 3

7. Statistical testing by permutation.
8. Canonical redundancy analysis (RDA) and canonical correspondence analysis (CCA). Multivariate analysis of variance by canonical analysis.

Day 4

9. Forward selection of environmental variables in RDA.
10. Spatial modelling: Origin of spatial structures. Multi-scale modelling of the spatial structure of ecological communities (PCNM). Extensions: MEM, AEM.

Day 5

11. Spatial structure functions: univariate correlograms and variogram.
12. Multivariate correlogram and variogram.
13. Cartographic interpolation, kriging.
14. Control for spatial autocorrelation in tests of species-environment relationships.
15. Test of space-time interaction in repeated surveys.
16. Spatial variation partitioning: canonical analysis or Mantel test?

⇒ Lectures in the morning.

⇒ Afternoons: Practicals about these topics using the R language

The day-by-day practicals are described in the file Short_Course_Practicals.pdf

The following instruction files distributed in the folder Practicals_in_R:

• Introduction to the R statistical language (file: Introduction_to_R.pdf)

• Practicals in the R language: Basic matrix operations (file: Basic_matrix_operations.pdf)

• Practicals using the R statistical language (file: Practicals_in_R.pdf)