

Universidad de Panama, Panama City

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Web site (distribution of R functions and PDFs of research papers):
<http://numeralecology.com>

Short course on

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

February 22–26, 2016

Day 1

0. Introduction to data analysis.
1. Ordination in reduced space: principal component analysis (PCA), correspondence analysis (CA), principal coordinate analysis (PCoA).
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 linear regression. R-square, adjusted R-square, AIC, tests of significance.
5. Polynomial regression.
6. Partial regression and variation partitioning.

Day 3

7. Statistical testing by permutation.
8. Canonical redundancy analysis (RDA) and canonical correspondence analysis (CCA).
Multivariate analysis of variance by canonical analysis.
9. Forward selection of environmental variables in RDA.

Day 4

10. Origin of spatial structures.
11. Beta diversity partitioning and LCBD indices
12. Replacement and richness difference components of beta diversity

Day 5

13. Spatial modelling: Multi-scale modelling of the spatial structure of ecological communities: dbMEM, generalized MEM, and AEM methods.
14. Community surveys through space and time: testing the space-time interaction in repeated surveys.
15. Is the Mantel test useful for spatial analysis in ecology and genetics? (If time allows)

⇒ Lectures in the morning.

⇒ Afternoons: Practicals about these topics using the R language

The following files are distributed in the folder Practicals_in_R.zip –

- Day-by-day list of the practical exercises (file: Short_course_practicals.pdf)
- 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)
- Documentation file for PCNM function (file: PCNM_documentation.pdf)
- Documentation file for pcoa.all function (file: pcoa.all_documentation.pdf)

The following files are distributed in the folder Spatial_eigenfunction_practicals.zip –

- NEwR Script Chapter 7
- Gault_forest_reserve
- Legendre-Gauthier practicals