Title: Multivariate static methods in community ecology
Dr. Łukasz Sobczyk

2 x 3 hours

Aims:
To gain the fundamental understanding of principal component analysis (PCA) and redundancy analysis (RDA). The ability to interpret correctly multivariate plots and published results of such analysis. Basic orientation in the whole spectrum of multivariate analysis methods.

Subjects:
First part, 3 hours, demonstrations:
Multivariate statistic and ecology. Two kinds of data: species data and environmental data. Two models of species response to environmental gradient; linear and unimodal (linear method and weighted averaging methods). What is ordination/gradient analysis? What it means “multivariate”? How to manage many variables?
PCA – principal component analysis as starting point of multivariate method. Explanation of main terminology: factors, scores, principal axis, biplots etc.
Connections with regression method.
Relationship between two sets of data (community and environmental conditions): redundancy analysis (RDA).
The plots. Frequently occurring symbols, conventions and their interpretation, correct captions and common mistakes in the literature.
Short information about other multivariate methods: correspondence analysis, detrended correspondence analysis, canonical correspondence analysis, canonical correlation analysis, discriminant analysis.
Few words about clustering methods.

Second part, 3 hours, practical exercises:
Analysis of example data; numerical results of PCA and RDA, plots, interpretation.
Short presentation of multivariate methods in popular public domain and commercial computer software: Past, Statistica, Canoco, R (?)
(Students work on their own computers, using the software provided).
Literature: