

SC5 - Statistical Methods in Ecotoxicology Using R

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Abstract

The open source statistical environment R (<http://www.r-project.org>) has become the lingua franca of data analysis among statisticians and is also in widespread use in many applied sciences. Many advanced or recent statistical and graphical/visualisation techniques are only available in R. In short, it is an extremely powerful all-in-one alternative software to specialised commercial data analysis software currently used by many ecotoxicologists. Moreover, it encourages collaborative and reproducible research.

The focus will be on giving the participants practical experience with the software as it requires some training get going using the programme. The course material will be a blend of lectures and case-studies with toxicological data, from recent publications.

ANOVA methods revisited, linear, non-linear regression (including dose-response analysis), logistic and Poisson regression models will be introduced through case studies. More advanced topics such as linear mixed models, mixture modelling, and multiplicity adjustment of p-values will also be discussed. Expert teachers will provide guidance and assistance throughout the course.

The course is intended for PhD students, researchers, and scientists in toxicology and environmental sciences. An elementary understanding of statistical concepts is a prerequisite. Participants are encouraged to bring their own data.

Course objectives

- 1) Review state-of-the-art statistical methods used in ecotoxicology
- 2) Provide hands-on experience for routine/standard data analysis
- 3) Demonstrate the power of open source statistical software
- 4) Enable participants to use the software for their own data analysis

Course level

Advanced