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Biodiversity data analysis (3BL2289)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en biologie	**Cours: 28 pg**	**Voir ci-dessous**	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante

Emmanuel Defossez

Contenu

This course is primarily structured to provide the necessary skills for manipulating and analyzing ecological, spatial, and temporal data, with a particular focus on biodiversity. This is an R course for both participants with no/little programming experience and those who wish to improve their skills.

Beginning with basic concepts such as R syntax, object types, and navigating through the RStudio or Visual Code interfaces, the course progresses to practical tasks including importing files, structuring and manipulating matrix (filtering, slicing, merging, etc.), and computing simple summary statistics from formatted data.

After this reminder of the basics, you'll start your " Biodiversity project" by building your biodiversity dataset from a variety of open data available online (species occurrence, taxonomy, satellite and climatic data, wikidata, etc.). By exploring your own dataset, you will learn:
• How to manipulate specific objects, including raster (spatial data format) and time series
• How to explore the data structure
• To apply statistic and modelling (including niche models and machine learning approach for motivated student).

Following this investigation, the next part of the course is devoted to data visualization and graph design, ranging from simple plots to advanced 3D interactive/animate visualization based on your biodiversity dataset.
The overall goal of this course is to develop the skills necessary to manipulate and structure large data sets to identify patterns and trends related to a specific issue. You'll reach this objective through creating a reproducible R script (ideally shared on GitHub) to investigate a question of your choice using your own dataset. For instance, you might explore the impact of plant diversity on insect diversity, or determine the optimal environmental conditions for species X.

Forme de l'évaluation

Continuous assessment: A data analysis project in the form of an annotated R-Script.

Evaluations will be based on: diversity of data used, diversity and complexity of functions used, reproducibility of R-Script, types of graphics, clarity and aesthetics of figures, annotation of R-Script and interpretation of results.

Modalités de rattrapage

improve the script of the original project

Pré-requis

Basic computer skills and motivation

Forme de l'enseignement

theoretical and practical lessons in the computer room

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Structure large data sets
- Analyse ecological, spatial and temporal biodiversity data
- Develop reproducible R script
- Produce publication ready plots

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