Doubs river fish communities

Source of data

Borcard et al. (2011) use this data as example dataset; data comes from PhD thesis of Verneaux (1973).

Description of the dataset

(from Borcard et al. 2011)

In an important doctoral thesis, Verneaux (1973) proposed to use fish species to characterize ecological zones along European rivers and streams. He showed that fish communities were good biological indicators of these water bodies. Starting from the source, Verneaux proposed a typology in four zones, and he named each one after a characteristic species: the trout zone, the grayling zone, the barbel zone and the bream zone. The corresponding ecological conditions, with much variation among rivers, range from relatively pristine, well oxygenated and oligotrophic to eutrophic and oxygen-deprived waters.

Data have been collected at 30 localities along Doubs river. The first matrix contains coded abundances of 27 fish species, the second matrix contains 11 environmental variables related to the hydrology, geomorphology, and chemistry of the river, and the third matrix contains the geographical coordinates (Cartesian, X and Y) of the sites.

Locality

Doubs river, which runs near France-Switzerland border in the Jura Mountains.

Environmental variables

Code	Description of the variable
das	Distance from the source [km]
alt	Altitude [m a.s.l.]
pen	Slope [per thousand]
deb	Mean minimum discharge [m^3s^{-1}]
pH	pH of water
dur	Calcium concentration (hardness) [mgL^{-1}]
pho	Phosphate concentration [mgL^{-1}]
nit	Nitrate concentration [mgL^{-1}]
amn	Ammonium concentration [mgL^{-1}]
oxy	Dissolved oxygen [mgL^{-1}]
dbo	Biological oxygen demand [mgL^{-1}]

R script for direct import of data to R

```
doubs.spe <- read.csv
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/DoubsSpe.csv',
row.names = 1)
```

```
doubs.env <- read.csv
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/DoubsEnv.csv',
row.names = 1)
doubs.spa <- read.csv
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/DoubsSpa.csv',
row.names = 1)
```

Data are also available from the library ade4 under the name doubs (the variable is a list of three data frames - poi, mil a xy):

```
# install.packages ('ade4')  # uncomment this line if the library is not installed
on your computer
library (ade4)
data (doubs)
doubs.spe <- doubs$poi
doubs.env <- doubs$mil
doubs.spa <- doubs$xy
```

References

- Verneaux, J. (1973) *Cours d'eau de Franche-Comté (Massif du Jura). Recherches écologiques sur le réseau hydrographique du Doubs. Essai de biotypologie*. Thèse d'état, Besançon. 1–257.
- Borcard, D., Gillet, F. & Legendre, P. (2011) *Numerical Ecology with R*. Springer, UseR! Edition.

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Last update: **2018/03/30 23:04**