Species occurrence and species richness–phosphorus relationships for lakes and streams worldwide

Level: Bachelor or Master
Start: Anytime
Project form: Database handling and modeling
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Background and short content of the project

Because aquatic eutrophication is currently considered one of the strongest threats to water quality and stream biodiversity worldwide, it is important to identify the freshwater types and regions whose biotic communities are most affected by nitrogen (N) and phosphorous (P) imbalances.

Azevedo et al (2013) compared relationships between P concentration and the relative species richness of autotrophs and heterotrophs in lakes and streams in different regions of the world. They first performed an inventory of peer-reviewed observational field data, which yielded a large number of studies worldwide. Then, concentration–response relationships were derived based on this dataset for the regions where the observations were done. However, because observations were only linked to the region where they were done, the relationships are still limited. Less data are, for example, available from (sub)tropical and xeric areas (see Figure 1).

Therefore, the **goal** of the current study, is to determine species occurrence ranges worldwide and subsequently link the concentration-response data to each region where the respective species occurs to determine species-richness relationships. This will be done for the data on P during a BSc internship, while for a master internship, N data available from Azevedo et al. (2015) wille be included as well as additional data found during a small literature search.

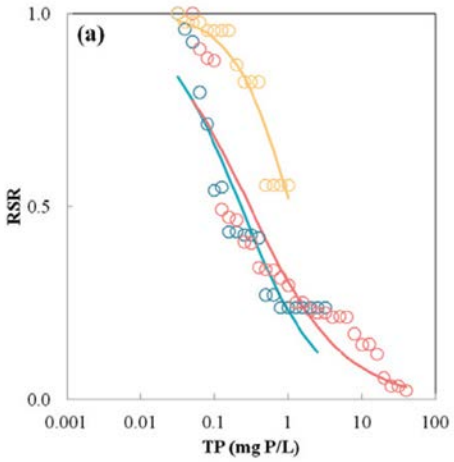

Figure 1: Relative species richness (RSR) of autotrophs along a total phosphorus (TP) gradient in Lakes. Green, orange, rose, and blue represent the (sub)tropical, xeric, temperate, and cold regions, respectively.

Literature

Azevedo LB, Van Zelm R, Elshout PMF, Hendriks AJ, Leuven R, Struijs J, De Zwart D, Huijbregts MAJ. 2013. Species richness – phosphorus relationships for lakes and streams worldwide. Global Ecology and Biogeography, 22(12), 1304-1314.

Azevedo LB, Van Zelm R, Leuven R, Hendriks AJ, Huijbregts MAJ. 2015. Combined ecological risks of nitrogen and phosphorus in European freshwaters. Environmental Pollution 200:85-92.