
What about the data quality used for assessing the ecological status? The example of uncertainty on the French Macrophyte index for rivers (IBMR) related to taxa misidentification

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Abstract

Since the implementation of the European Water Framework Directive in 2000, the assessment of water bodies ecological status is closely based on hydrobiological methods, including several biological elements. However, the assessment using bioindicators is subject to a range of uncertainties that may occur at each stage of the protocol.

The application of sampling protocols allows the calculation of hydrobiological metrics from taxonomic lists. A first source of variability, related to the surveyor effect, can be identified at this stage of the protocol as species identification mistakes.

The aim of this project is to evaluate the impact of the taxa identification errors on IBMR (French standard NF T90-395), officially used in the national river assessment

The first stage was the construction of a confusion matrix, used to model and evaluate the impact of a random introduction of taxonomic confusions on the IBMR score and on the resulting assessment of rivers. An initial approach allowed to analyse the weight and impact of each pair of confusion on the index score. Secondly, new floristic lists were generated by randomly introducing several confusions, to reflect the reality on the field.

Among all paired confusions identified, 56 lead to a shift of the index value of 1 to over 2 points (23 lead to a reduction, 33 to an increase). The modelling of the impact of multiple confusions on 5.400 surveys showed an average difference of 0.05 points, but the maximum can be much higher, mainly for the low richness sites. These shifts lead to a misclassification for 24% of the surveys.

Finally, the uncertainty due to taxonomic confusions can vary significantly depending on the river type concerned. It is then possible to determine weighted coefficients for the impact of confusions between ecoregions.

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