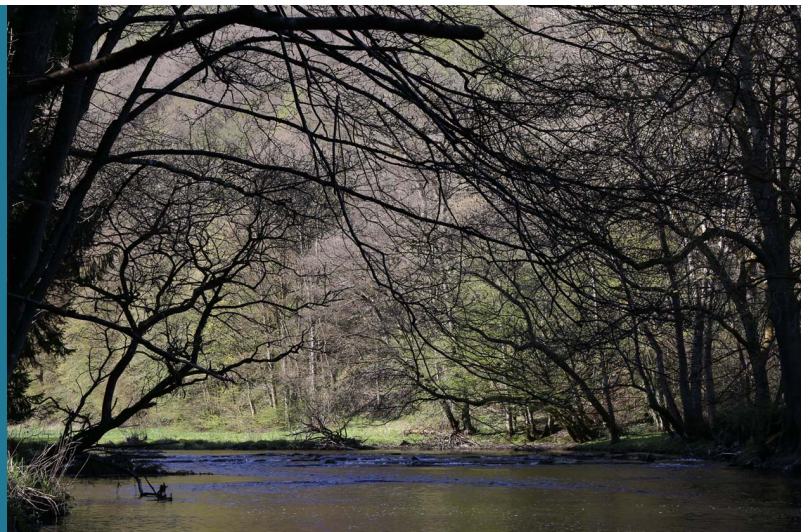


## I2M2

Intercalibration of the new multi-metric I2M2 index for evaluation of the quality of water in Luxembourg watercourses on the basis of macroinvertebrate communities.



### INSPIRATION

In Luxembourg, evaluation of the quality of water in watercourses on the basis of macroinvertebrate communities, small animals living on river beds, has been carried out for a number of years following the Normalised Global Biological Index (IBGN). As this is no longer compatible with the requirements issued in the interim by the European Framework Directive, a new evaluation method needs to be developed.

Faced with this same issue, French researchers have developed I2M2, a new multi-metric index intended to replace the IBGN. The I2M2 index is composed of five metrics presenting the best level compromise between an average power of discrimination increased with different types of pressure, a low specificity for any given type of pressure, significant stability in reference conditions and the best possible complementarity. However, before being ready for use in the programmes intended to evaluate the quality of water in watercourses through macroinvertebrate communities, the I2M2 index must still be intercalibrated to European standards. This intercalibration requires application of a new protocol for sampling macroinvertebrate communities, which has been regularly used by the Luxembourg Institute of Science and Technology (LIST) in various types of watercourses in Luxembourg since 2007.

### INNOVATION

In order to intercalibrate the I2M2 index, sites representative of the best environmental conditions are necessary. In Luxembourg, these sites are unequally distributed across various types of watercourses, such as rivers or streams in the various eco-regions of the country. Data previously used by LIST researchers will be made available for this intercalibration, and new specially dedicated inventories will be produced. To allow for intercalibration of the various types of watercourses without representative sites in Luxembourg, the results of the multi-metric I2M2 index obtained in watercourses with comparable typologies observed in neighbouring countries and presenting conditions which may be considered as close to the reference condition will be used.

This approach is innovative in its cross-referencing of typologies of watercourses from two neighbouring countries, Luxembourg and France for cross-border intercalibration of the I2M2 method. The eco-regions of Oesling and Gutland in Luxembourg, and the Ardennes and the Côtes Calcaires Est region in France may be easily reconciled without any difficulty from the point of view of their topography and geology.

### IMPACT

The I2M2 project will allow for resolution of the typological problems between watercourses in France and Luxembourg to select new potential reference sites for certain types of watercourse. The equivalent types proposed in the two regions will then be validated on the basis of environmental data (physico-chemical, hydro-morphology, land use). Calculation of the multi-metric I2M2 index will then be undertaken both on the basis of inventories existing in Luxembourg and in France since 2007 following application of the new sampling protocol, and on the basis of new inventories carried out in both countries in 2015. All of the results obtained will then be evaluated and inter-calibrated with European standards.

With this project, the developers of the I2M2 index will be able to test the method outside of France, which will allow them to check its correlation with the pressures of a neighbouring country and with the IBGN index. Finally, this project will allow the various partners to propose limits to quality categories for the I2M2 index for equivalent types in both countries concerned by this intercalibration.

### Partners

Université de Lorraine (FR) , National Research Institute of Science and Technology for Environment and Agriculture (FR)

### Financial Support

Administration de la Gestion de l'Eau

### Contact

5, avenue des Hauts-Fourneaux  
L-4362 Esch-sur-Alzette  
phone: +352 275 888 - 1 | [LIST.lu](http://LIST.lu)

Alain DOHET ([alain.dohet@list.lu](mailto:alain.dohet@list.lu))  
© Copyright May 2025 LIST

LUXEMBOURG  
INSTITUTE OF SCIENCE  
AND TECHNOLOGY

