Common Intercalibration Metrics

FACT SHEET

TAXONOMIC COMPOSITION METRIC FOR LAKE EUTROPHICATION

ICM_LM

GENERAL INFORMATION

BIOLOGICAL QUALITY ELEMENT

Macrophytes

WATER CATEGORY

Lakes

MAIN STRESSOR

Eutrophication

GEOGRAPHICAL INTERCALIBRATION GROUP

Mainly Central-Baltic and Nordic

COMMON INTERCALIBRATION TYPES

CB and N lake types

COUNTRIES PARTICIPATING IN INTERCALIBRATION EXERCISE

Countries from CB and N GIGs

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SPECIFICATION

COMMON METRIC DESCRIPTION (INCL. WFD'S INDICATIVE PARAMETERS)

The metric was elaborated by an IC expert (N. Willby) for the purpose of the pan-European intercalibration exercise. For app. 170 macrophyte taxa a lake trophic rank (LTR) has been derived. The LTR scores grade taxa by their response to eutrophication (TP concentration).

For all the lakes in WISER common macrophyte database an Intercalibration Common Index for lake macrophytes (ICM_LM) was calculated as an average value of LTRs (based on presence/absence data).

COMBINATION RULE FOR MULTI-METRICS

Not applicable

SOFTWARE / (EXCEL) SPREADSHEET AVAILABLE FOR CALCULATING THE (INDIVIDUAL) COMMON METRIC(S)

Not applicable

AVAILABLE DOCUMENTS / ONLINE SOURCES REPORTING ON THE DEVELOPMENT OF COMMON METRIC(S)

Deliverable 3.2-3 Report on the most suitable lake macrophyte based assessment methods for impacts of eutrophication and water level fluctuations; available at: www.wiser.eu

PRESSURES + ASSESSMENT SYSTEMS

TAXONOMIC COMPOSITION METRIC
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DESCRIPTION OF DATA SET TO ESTABLISH RELATIONSHIP TO PRESSURE / NATIONAL ASSESSMENT SYSTEMS[1]

The WISER common database includes macrophyte data from approximately 2000 lake-years from 16 countries. For testing the response of macrophyte metrics to eutrophication the TP concentration was used as a pressure proxy. Both biological and TP data for over 1500 lake-years from 12 countries were available. Database was dominated by FI, SE and NO lakes followed by PL, LV and IE ones. From FR, DE and DK only three or two lakes were available. All the lakes belong to four GIGs (CB, N, ATL and EC), however the EC and ATL GIG were represented by a very few lakes only (17 and 13 respectively). No data from MED and ALP GIG were available.

TYPE OF DOSE-RESPONSE-RELATIONSHIP[2]

Since ICM_LM:TP relationship was linear a log regression model was applied. The values of **R^2>0.30** and **R>0.55** were assumed as sufficient to accept a metric as a well performing one. In a pool of all the lakes the ICM_LM:TP relationship was sufficiently strong (R^2=0.52, R=0.72, p=0.000). In different countries determination coefficient ranged between R^2>0.5 (UK, NO, IE, FI, SE) to R^2<0.2 (PL, EE); in BE, LT and RO was insignificant (data too scarce).The metric performed best in high and moderate alkalinity lakes but its use in low alkalinity lakes (<0.2 meq/l) was limited (R^2=0.26, R=0.51).

NATIONAL ASSESSMENT METHODS (OR PARTS THEREOF) RELATED TO THE COMMON METRIC(S)[3]

FEATURES OF THE RELATIONSHIP TO NATIONAL ASSESSMENT METHODS (OR PARTS THEREOF)[4]

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REMARKS

CONCLUDING REMARKS[1]

ICM_LM was proved to be a good indicator of eutrophication process. It can be recommended in many countries and lakes types as common metric for IC purposes. The ICM_LM performed better in moderate- and high alkalinity lakes and its use in ecosystems of the alkalinity <0,2 meq/L may be limited.

[1] short summary of rationale for common metric selection, major findings, and overall discussion