Common Intercalibration Metrics

FACT SHEET

ABUNDANCE METRIC FOR LAKE EUTROPHICATION

MAXIMUM COLONISATION DEPTH (C_MAX)

GENERAL INFORMATION

BIOLOGICAL QUALITY ELEMENT

Macrophytes

WATER CATEGORY

Lakes

MAIN STRESSOR

Eutrophication

GEOGRAPHICAL INTERCALIBRATION GROUP

Central-Baltic, Nordic

COMMON INTERCALIBRATION TYPES

Deep lakes (max depth >5m)

COUNTRIES PARTICIPATING IN INTERCALIBRATION EXERCISE

Central-Baltic and Nordic GIG

Common Intercalibration Metrics

FACT SHEET

ABUNDANCE METRIC FOR LAKE EUTROPHICATION

MAXIMUM COLONISATION DEPTH (C_MAX)

SPECIFICATION

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

The metric is an absolute value of maximum depth of plant growth and is considered as a measure of abundance

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

ABUNDANCE METRIC FOR LAKE EUTROPHICATION

MAXIMUM COLONISATION DEPTH (C_MAX)

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

Data on maximum colonisation depth from 16 countries (mainly the CB-GIG database, supplemented with data from Italy, Sweden, Norway, Finland, UK and Ireland) and app. 1300 lakes were collected. TP and chlorophyll a concentration were used as a proxy of pressure.

TYPE OF DOSE-RESPONSE-RELATIONSHIP[2]

The log-log regression between C_max and different eutrophication indicators (TP, TN, chla, Secchi disk reading) in lakes of different alkalinity and couloru was used. In high alkalinity lakes (>0.1 meq/l) the strongest relationships with Secchi depth (R^2=0.58) and chla (R^2=0.35) were found, and also in low and moderate alkalinity lakes: R^2=0.43 and R^2=0.22, respectively. In Nordic lakes water colour and latitude appeared to be an important factors affecting C_max.

A large variability in C_max for reference lakes both between countries and within individual countries was demonstrated.

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]

[1] e.g. number and location of sites, common intercalibration types covered, sampling season, spatial and temporal match of data, level of data aggregation

[2] e.g. explanatory variables, type of statistical analysis, quality of relationship

Common Intercalibration Metrics

FACT SHEET

ABUNDANCE METRIC FOR LAKE EUTROPHICATION

MAXIMUM COLONISATION DEPTH (C_MAX)

REMARKS

CONCLUDING REMARKS[1]

The analyses on abundance demonstrated that max colonization depth is significantly correlated to eutrophication stressors and can be used in deep lakes (max depth > 5 m) as an indicator of eutrophication. Clear relationships can be established between macrophyte abundance (C_max and coverage) and chlorophyll *a* and Secchi depth.

Since a large variability in C_max for reference lakes was demonstrated it is suggested to conduct more detailed investigations on that in the future.

It is recommended that C_max is used as a macrophyte abundance metric in lakes with maximum depths above 6 m (or mean depths above 3 m) and coverage of submerged macrophytes in shallow lakes (mean depth <3 m).

The analyses were mainly conducted on siliceous deep or shallow lakes (due to data availability), but other lake types, as for example coloured lakes have other macrophyte characteristics - as also demonstrated here, and should be analysed in more details.

At latitudes above approximately 60^{o} C_max may be reduced due to decreased PAR.