



LAKE PHYTOPLANKTON

BIOLOGICAL QUALITY ELEMENT

Phytoplankton

WATER CATEGORY

Lakes

MAIN STRESSOR

Eutrophication

GEOGRAPHICAL INTERCALIBRATION GROUP

Central-Baltic, Northern, Mediterranean, [Eastern Continetal]

COMMON INTERCALIBRATION TYPES

All IC lake types (except Alp-GIG). Data limited for applicability in EC GIG

COUNTRIES PARTICIPATING IN INTERCALIBRATION EXERCISE

BE, BU, CY, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LT, LV, NL, NO, PL, PO, RO, SE, UK



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

The lake phytoplankton metric is currently a multi-metric based on chlorophyll, two composition metrics (Phytoplankton Taxonomic Index (PTI) and a Morpho-Functional Group index (MFGI)) and two bloom metrics (evenness and a cyanobacterial bloom metric). It utilises lake phytoplankton composition data from July to September and chlorophyll data from April to September.

A common chlorophyll classification has already been agreed in the IC process. Details of the 4 new candidate metrics are given in:

Phillips et al. (2010) Lake phytoplankton composition metrics WISER Deliverable D3.1-1.

Mischke et. al. (2010). A common metric for phytoplankton blooms in European lakes. WISER Deliverable D3.1-2.

COMBINATION RULE FOR MULTI-METRICS

Still to be decided. Initially average of EQRs

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

Microsoft Access and Excel tools to be made available

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

Phillips et al. (2010) Lake phytoplankton composition metrics WISER Deliverable D3.1-1.

Mischke et. al. (2010). A common metric for phytoplankton blooms in European lakes. WISER Deliverable D3.1-2





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

WISER WP3.1 database – constituted from 4 GIG datasets (CB, EC, M & N GIGs)

Type of dose-response-relationship²

Phytoplankton Taxonomic Index (PTI) – the new PTI index is developed from trophic scores of phytoplankton taxa along the eutrophication gradient. A GAM relationship related PTI to total phosphorus concentrations (TP).

Morpho-Functional Group Index (MFGI) - least squares regression relating MFGI to TP

Evenness: least squares regression relating Pielou's Evenness Index to TP

Cyanobacterial blooms: parametric quantile regression relating cyanobacterial biovolume to TP and deriving the likelihood of exceeding World Health Organisation risk thresholds.

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

PTI related to metrics in several European countries (e.g. NO, SE, DE, UK, IT, ES)

Evenness a component in Estonian national method

Cyanobacterial metric related to metrics in several European countries
(e.g. NL, SE, UK) but existing metrics are largely based on relative %
biovolume, compared with the new metric based on actual biovolume.

FEATURES OF THE RELATIONSHIP TO NATIONAL ASSESSMENT METHODS FOR DARTS THEREOE)4



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CONCLUDING REMARKS¹

The 4 candidate metrics for lake phytoplankton have been made available to the GIGs for comparison with national metrics. Initial reaction from the GIGs has been very positive with the N, CB and Med GIG using the PTI metric as a common metric for phytoplankton composition and some countries (e.g. UK, NO) are considering adopting a country-calibrated version as a national metric for the 2nd phase of Intercalibration. GIGs are still discussing the value of adopting a bloom metric. No current national metric exists, but analysis is continuing on whether it is redundant (high correlation with the PTI) or whether it increases uncertainty in the overall BQE assessment result. GIGs are, therefore, waiting for the WISER uncertainty analysis of phytoplankton metrics to be completed in May 2011, before making a final decision on adoption of a bloom metric. The selection and combination of the metrics into an integrated multi-metric will also be finalised in summer 2011, following the WISER uncertainty analysis, to ensure IC can be achieved on schedule (by Autumn 2011).