Method: Assessment system for rivers using diatom index IO [Ocena stanu ekologicznego rzek w oparciu o Multimetryczny Indeks Okrzemkowy (IO)]

1. General information

1.01 GIG: Central-Baltic
Relevant intercalibration types: n.a.
1.02 Category: Rivers
1.03 BQE: Benthic Diatoms
1.04 Country: Poland
1.05 Specification:
1.06 Method name: Assessment system for rivers using diatoms
1.07 Original name:
Ocena stanu ekologicznego rzek w oparciu o Multimetryczny Indeks Okrzemkowy IO
1.08 Status: Method is/will be used in Second RBMP (2015)
1.09 Detected pressure(s):
Catchment land use, Eutrophication, Pollution with organic matter, General degradation,
Pressure-impact-relationship: n.a.
1.10 Internet reference: n.a.
1.11 Pertinent literature of mandatory character: n.a.
1.12 Scientific literature: n.a.
1.13 Method developed by: n.a.
Email of developer: joanna.faltynowicz@imgw.wroc.pl
Institute of developer: n.a.
1.14 Method reported by: Aleksandra Zgrundo
Email of person reporting the method: aleksandra.zgrundo@ug.edu.pl
Email of institute reporting the method:
Główny Inspektorat Ochrony Środowiska
1.15 Comments: none

2. Data acquisition

Field sampling/surveying
2.01 Sampling/Survey guidelines:
EN-PN 13946:2014-05 „Jakość wody – Wytyczne do rutynowego pobierania próbek oraz wstępnego przygotowania do analiz okrzemek bentosowych z rzek i jezior”
EN-PN 14407:2014-05 „Jakość wody – Wytyczne dotyczące identyfikacji i oznaczania ilościowego próbek okrzemek bentosowych z rzek i jezior”.
Zgrundo i in. 2018. Podręcznik do monitoringu i oceny rzecznych jednolitych części wód powierzchniowych na podstawie fitobentosu
Zgrundo i in. 2018. Annex. Wytyczne metodyczne do przeprowadzenia monitoringu i oceny potencjału ekologicznego zbiorników zaporowych w Polsce
2.02 Short description:
The method is consistent with EN 13946 Water quality - Guidance for the routine sampling and preparation of benthic diatoms from rivers and lakes and EN 14407:2014 Water quality - Guidance for the identification and enumeration of benthic diatom samples from rivers and lakes

2.03 Method to select the sampling/survey site or area: Sites most representative of waterbody and associated with sampling sites used for other biota
2.04 Sampling/survey device: Toothbrush or scraper
2.05 Specification: Toothbrush, knife, scraper, strong scissors, plastic tray, plastic sample bottles with watertight lids, waterproof permanent marker pen or another means of labelling samples, artificial substrate
2.06 Sampled/surveyed habitat:
Specification of sampled habitat: Generally hard substrates of natural (as cobbles, boulders) and anthropogenic origin but also other as macrophytes and macroalgae when former are not present. Sample habitat is chosen based on that which is appropriate for optimising the presence of diatoms at a site.
Sampled habitat: Single habitat(s).
2.07 Sampled/surveyed zones in areas with tidal influence: not relevant
2.08 Sampling/survey month(s):
Spring and autumn.
2.09 Number of sampling/survey occasions (in time) to classify site or area: One occasion per sampling season.
2.10 Number of spatial replicates per sampling/survey occasion to classify site or area: Minimum 5 replicates per sampling occasion.
2.11 Total sampled/surveyed area or volume or total sampling duration to classify site or area: At least 10 cm^2.

Sample processing
2.12 Minimum size of organisms sampled and processed: n.a.
2.13 Sample treatment:
Sample is divided (sub-sampling) and organisms of a sub-sample are identified.
2.14 Level of taxonomical identification:
Level: Species/species groups
Specification of level of determination: n.a.
2.15 Record of abundance:
Determination of abundance: Relative abundance
Abundance is related to: n.a.
Unit of the record of abundance: Number of valves
Other record of abundance: a total of at least 300 diatom valves counted per sample
2.16 Quantification of biomass: n.a.
2.17 Other biological data: none
2.18 Special cases, exceptions, additions: none
2.19 Comments: none

3. Data evaluation
Evaluation
3.01 List of biological metrics:
Diatom Index IO = (ZTI + ZSI + GR)/3; ZTI = 1-(TI x 0.25); ZSI = 1-[(SI-1) x 0.33]; GR = Sum of relative abundance of reference taxa; TI = Trophic Index (Rott et al. 1999); SI =

Saprobic Index (Rott et al. 1997); TI and SI are calculated using a weighted formula of Zelinka & Marvan (1961)
3.02 Does the metric selection differ between types of water bodies: No
3.03 Combination rule for multi-metrics: Average metric scores
3.04 From which biological data are the metrics calculated:
List of biological metrics: Data from single sampling/survey occasion

Reference conditions
3.05 Scope of reference conditions: Surface water type-specific
3.06 Key source(s) to derive reference conditions:
Scope of reference conditions:
Existing near-natural reference sites, Expert knowledge, Least Disturbed Conditions
3.07 Reference site characterisation:
Number of sites: A total of 30 sites for different abiotic river types
Geographical coverage:
Reference zones in natural and landscape parks in Central Highlands, Carpathians, Central Plains, Baltic Province and Eastern Plains
Location of sites:
Karkonosze, Tatry, Bieszczady, Magurski, Drawienski and Biebrzanski Natural Parks, Chojnicki, Wdzydzki, Suwalski Landscape Parks
Data time period: February - April and September - November 2004-2009
Criteria:
Absence of point pollution sources, watershed dominated by natural forests, meadows and wetlands; slight hydromorphological changes have not been taken into account as they do not affect benthic diatom communities
3.08 Reference community description:
Epilithic diatom communities dominated by reference species, i.e. oligo-mesotrophilous and oligosaprobic depending on a stream/river type
3.09 Results expressed as EQR: Yes

Boundary setting
3.10 Setting of ecological status boundaries: n.a.
3.11 Boundary setting procedure: In preparation
3.12 "Good status" community: In preparation

Uncertainty

3.13 Consideration of uncertainty: No (to be done)
3.14 Comments: none

Method: Assessment system for lakes using diatom index IOJ [Ocena stanu ekologicznego jezior w oparciu o Multimetryczny Indeks Okrzemkowy okrzemkowy (Indeks Okrzemkowy IOJ)]

1. General information

1.01 GIG: Central-Baltic
1.02 Category: Lakes
1.03 BQE: Benthic Diatoms
1.04 Country: Poland
1.05 Specification:
1.06 Method name: Assessment system for lakes using diatoms
1.07 Original name:
Ocena stanu ekologicznego jezior w oparciu o Multimetryczny Indeks Okrzemkowy (Indeks Okrzemkowy IOJ)
1.08 Status: Method is/will be used in Second RBMP (2015)
1.09 Detected pressure(s):
Catchment land use, Eutrophication *Pressure-impact-relationship:* No, pressure-impact relationship has not been tested.
1.10 Internet reference: n.a.
1.11 Pertinent literature of mandatory character: n.a.
1.12 Scientific literature: n.a.
1.13 Method developed by: Joanna Picinska-Faltynowicz
Email of developer: joanna.faltynowicz@imgw.wroc.pl
Institute of developer:
Institute of Meteorology and Water Management, Wroclaw Branch, Department of Ecology
1.14 Method reported by: Aleksandra Zgrundo
Email of person reporting the method: aleksandra.zgrundo@ug.edu.pl
Email of institute reporting the method:
Główny Inspektorat Ochrony Środowiska
1.15 Comments: none

2. Data acquisition

Field sampling/surveying
2.01 Sampling/Survey guidelines:
EN-PN 13946:2014-05 „Jakość wody – Wytyczne do rutynowego pobierania próbek oraz wstępnego przygotowania do analiz okrzemek bentosowych z rzek i jezior”
EN-PN 14407:2014-05 „Jakość wody – Wytyczne dotyczące identyfikacji i oznaczania ilościowego próbek okrzemek bentosowych z rzek i jezior”.
Zgrundo i in. 2018. Podręcznik do monitoringu i oceny jeziornych jednolitych części wód powierzchniowych na podstawie fitobentosu
2.02 Short description:
The method is consistent with EN 13946 Water quality - Guidance for the routine sampling and preparation of benthic diatoms from rivers and lakes and EN 14407:2014 Water quality - Guidance for the identification and enumeration of benthic diatom samples from rivers and lakes

2.03 Method to select the sampling/survey site or area: Sites most representative of waterbody and associated with sampling sites used for other biota
2.04 Sampling/survey device: Toothbrush or scraper
2.05 Specification: Toothbrush, knife, scraper, strong scissors, plastic tray, plastic sample bottles with watertight lids, waterproof permanent marker pen or another means of labelling samples, artificial substrate
2.06 Sampled/surveyed habitat:
Specification of sampled habitat: Generally hard substrates of natural (as cobbles, boulders) and anthropogenic origin but also other as macrophytes and macroalgae when former are not present. Sample habitat is chosen based on that which is appropriate for optimising the presence of diatoms at a site.
Sampled habitat: Single habitat(s)
2.07 Sampled/surveyed zones in areas with tidal influence: not relevant
2.08 Sampling/survey month(s): Late summer – autumn
2.09 Number of sampling/survey occasions (in time) to classify site or area: One occasion per sampling season
2.10 Number of spatial replicates per sampling/survey occasion to classify site or area: One
2.11 Total sampled/surveyed area or volume or total sampling duration to classify site or area:
n.a.

Sample processing
2.12 Minimum size of organisms sampled and processed: n.a.
2.13 Sample treatment:
Sample is divided (sub-sampling) and organisms of a sub-sample are identified.
2.14 Level of taxonomical identification:
Level: Species/species groups
Specification of level of determination: n.a.
2.15 Record of abundance:
Determination of abundance: Relative abundance
Abundance is related to: n.a.
Unit of the record of abundance: Number of valves
Other record of abundance:
a total of at least 300 diatom valves counted per sample (in a permanent slide)
2.16 Quantification of biomass: n.a.
2.17 Other biological data: none
2.18 Special cases, exceptions, additions: none
2.19 Comments: none

3. Data evaluation
Evaluation
3.01 List of biological metrics:
Diatom Index IOJ = 0.6 x ZTJ + 0.4 x GRJ; ZTJ = 1-(TJ x 0.1); TJ calculated using a weighted formula of Zelinka & Marvan (1961); GRJ = Sum of relative abundance of reference taxa;

3.02 Does the metric selection differ between types of water bodies: No
3.03 Combination rule for multi-metrics: Average metric scores
3.04 From which biological data are the metrics calculated:
List of biological metrics: Data from single sampling/survey occasion in time

Reference conditions

3.05 Scope of reference conditions: Surface water type-specific
3.06 Key source(s) to derive reference conditions:
Scope of reference conditions:
Existing near-natural reference sites, Expert knowledge, Least Disturbed Conditions
3.07 Reference site characterisation:
Geographical coverage:
Reference zones in natural and landscape parks of Central Plains, Baltic Province and Eastern Plains
Location of sites:
Drawienski Natural Park, Chojnicki, Drawski and Suwalski Landscape Parks
Data time period: August-October 2006-2009
Criteria:
Absence of point pollution sources, watershed overgrown by natural forests, meadows and wetlands
3.08 Reference community description:
Epiphytic diatom communities dominated by reference species, i.e. oligo-, meso- or eutrophilous depending on lake type
3.09 Results expressed as EQR: Yes

Boundary setting
3.10 Setting of ecological status boundaries: n.a.
Other boundary setting: Ecological status boundaries are processing at present
3.11 Boundary setting procedure: In preparation
3.12 "Good status" community: In preparation.

Uncertainty
3.13 Consideration of uncertainty: No (to be done)
3.14 Comments: none