Begleitung des Interkalibrierungsprozesses (O 4.09) - Teilprojekt komponentenübergreifende Arbeiten und Makrozoobenthos der Seen

www.Interkalibrierung.de

Tätigkeitsbericht

Im Auftrag der Länderarbeitsgemeinschaft Wasser (LAWA)

Berichtszeitraum 01.04.2010 – 31.12.2010

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Inhalt

1. Einleitung, Auftrag und Zielsetzung

Die Interkalibrierung erwies sich als eine der schwierigsten Herausforderungen bei der Umsetzung der Wasserrahmenrichtlinie. Sie soll die internationale Vergleichbarkeit der Bewertungen nach Wasserrahmenrichtlinie gewährleisten, obwohl die Bewertungsverfahren der einzelnen Mitgliedstaaten sehr unterschiedlich sein dürfen und daher auch sind. Letztlich legt sie verbindliche Klassengrenzen für die fünf Bewertungsklassen fest.

Insbesondere die Klassengrenze "gut / mäßig" ist dabei von besonderer Bedeutung, weil für mäßige Gewässer Maßnahmen zur Verbesserung des ökologischen Zustands getroffen werden müssen, während für gute kein Handlungsbedarf besteht. Auch die Klassengrenze "sehr gut / gut" ist wichtig, weil sehr gute Gewässer geschützt werden müssen.

Die Interkalibrierung fällt in den Aufgabenbereich der EU-Arbeitsgruppe ECOSTAT („Ecological Status“). Zur wissenschaftlichen Betreuung der Interkalibrierung wurde das „European Centre for Ecological Water Quality and Intercalibration (EEWAI)“ des Joint Research Centre (JRC) in Ispra, Italien eingerichtet.

In der gerade laufenden zweiten Phase werden die Bewertungsverfahren interkalibriert, die in der ersten scheiterten oder noch nicht fertig entwickelt waren. Außerdem werden offene Fragen und Probleme der ersten Phase aufgegriffen und bearbeitet.

Mittlerweile gibt es eine Vielzahl von Interkalibrierungs-Arbeitsgruppen, weil diese nach Gewässerkategorie, Geographie („Geographical Intercalibration Groups“ = GIGs) und Biokomponenten aufgeteilt sind.

Deutschland bringt sich mit einer Reihe von Experten intensiv in die Interkalibrierung ein, um nach Möglichkeit die deutschen Bewertungsverfahren ohne nachträglichen Überarbeitungsbedarf erfolgreich zu interkalibrieren, und um darüber hinaus die deutschen Positionen wirksam zu vertreten.

Daher übernahm Deutschland fürs Seen-Makrozoobenthos sowie für die großen Fliessgewässer die internationale GIG-übergreifende Leitung und leitet die CB-GIG-Expertengruppen fürs Seen-Makrozoobenthos sowie für die Fische der Seen. Ferner führt Deutschland einen großen Teil der internationalen Analysen für die großen Fließgewässer, für das Seen-Makrozoobenthos im Central/Baltic- und Alpinen GIG, für die Fliessgewässermakrophyten im Central/Baltic-GIG, fürs Seenplankton im Central/Baltic-GIG sowie für die Fische der Seen durch.

Das hier betrachtete Teilprojekt ist Teil eines LAWA-Gesamtprojekts zur Unterstützung aller in 2010 anfallenden deutschen Interkalibrierungsaufgaben, die nicht anderweitig finanziert werden konnten.

Für die einzelnen Projektpartner ges Gesamtprojekts wurden separate Verträge mit eigener Berichtspflicht abgeschlossen, Daher wir bezüglich der Ergebnisse zu den anderen Biokomponenten und Gewässerkategorien auf die entsprechenden separaten Berichte verwiesen.

Der **Auftrag für das vorliegende Teilprojekt** beinhaltete vor allem nationale und internationale Interkalibrierungsarbeiten zum Makrozoobenthos in Seen sowie zu großen Flüssen und übergreifende Arbeiten zum Gesamtprojekt.

- Makrozoobenthos der Seen:
  - Teilnahme an ca. 6 internationalen Expertentreffen (Central GIG, Alpines GIG und GIG-übergreifend)
  - GIG-übergreifende Leitung und Koordination der Makrozoobenthos-Expertengruppen
  - Wissenschaftliche und Gesamtleitung des CB-GIG-Makrozoobenthos-Expertengruppe (Ausarbeitung der Interkalibrierungskonzepte, Koordination, Organisation, offizielle Interkalibrierungsberichte etc.)
  - Zusammenstellung der nationalen Daten in den erforderlichen Formaten;
  - nationale Berechnungen und statistische Absicherungen der Ergebnisse;
  - Fortführung der internationalen Makroinvertebraten-Datenbank zur Durchführung der Interkalibrierung im CB- und AL-GIG;
- konzeptionelle Ausarbeitung zur Umsetzung der Ecostat-Beschlüsse sowie der Interkalibrierungsergebnisse in Deutschland;
- Übertragung der Interkalibrierungsergebnisse fürs Fliessgewässer-Makrozoobenthos auf die nicht interkalibrierten deutschen Gewässertypen: Konzeption, statistische Ausarbeitung, Dokumentation, Abstimmung mit der LAWA und Berichterstattung
- Unterstützung der Arbeiten für große Fließgewässer: Konzeptionelle und interpretative Unterstützung des Leiters Herrn Dr. Schöll (BfG) sowie Datenhaltung und Berechnung von Interkalibrierungsindices für die internationalen Arbeiten.
- Fortführung der zentralen (Interkalibrierungs-) Datenbank:
  - Sammeln und Einpflegen der Daten in die Datenbank für die biologischen Qualitätskomponenten Phytoplankton, Makrozoobenthos; Makrophyten/Phytobenthos für Fließgewässer, Seen, Küsten- und Übergangsgewässer;
- Öffentlichkeitsarbeit: Fortführung der Internetpräsenz www.Interkalibrierung.de, Datenauskünfte etc.;
- Projektkoordination

Wie im Vorgängerprojekt bestand der Großteil der Arbeiten in der Teilnahme und Mitarbeit in diversen Gremien mit Vor- und Nachbereitung (Studium der entsprechenden Hintergrunddokumente, Ausarbeitung von Präsentationen, Protokollen, Tagungsordnungen, Emailkorrespondenzen etc.) sowie Datenaufarbeitungen, während nur wenig Aufwand für die nationale Übersichtsdatenbank, die Öffentlichkeitsarbeit und die Projektkoordination notwendig war. Da die hieraus resultierenden Ergebnisse nur schwer konkret darstellbar sind, stellt der vorliegende Projektbericht eher einen Tätigkeitsbericht als einen Ergebnisbericht dar.

2. Teilnahme an nationalen und internationalen Treffen

Im Berichtszeitraum wurden 12 durchschnittlich 2-tägige Treffen besucht, davon 7 im Ausland **Tab. 1**.

Die nationalen Treffen bei den betreuenden LAWA-Fliessgewässer- und -Seen-Expertenkreisen dienten der Abstimmung der international einzubringenden deutschen Interkalibrierungspositionen sowie der Berichterstattung über den Fortschritt der Interkalibrierungsarbeiten.

Die internationalen Treffen dienten der Planung, Koordination und Durchführung der eigentlichen Interkalibrierungsarbeiten, sowie der Beteiligung Deutschlands an übergreifenden Problematiken (z.B. Interkalibrierungs-Leitfaden).

Tab. 1: *Teilnahme an Expertentreffen*

Datum	**Treffen**	**Ort**
8.-9.4.2010	Ecostat	Brüssel / BE
14.-17.4.2010	AL-GIG Makrozoobenthos-IK	Rom / IT
19.-20.4.2010	Interkalibrierung großer Flüsse	Koblenz
26.-27.5.2010	LAWA-Seenexperten	Steinhude
15.-18.6.2010	CB-GIG Makrozoobenthos-IK	Tartu / EE
6.-8.7.2010	LAWA-Fliessgewässerexperten	Hamburg
26.-27.8.2010	Comparability Criteria	Ispra / IT
22.-23.9.2010	Interkalibrierung großer Flüsse	Koblenz
20.-22.102010	CB-GIG Makrozoobenthos-IK	Aalst / BE
3.-6.11.2010	Koordinatorentreffen Seen-IK	Ispra / IT
6.-8.12.2010	CB-GIG Makrozoobenthos-IK	Aix e.P. / FR
15.-16.12.2010	Koordination IK großer Flüsse	Koblenz

3. Internationale Arbeiten

Die internationalen Aktivitäten umfassten hauptsächlich die Absprachen und Arbeiten zur Interkalibrierung in den Seeninvertebratengruppen des CB- und AL-GIG, sowie in der Gruppe zur Interkalibrierung großer Fliessgewässer. Darüber hinaus erfolgten Absprachen und Berichterstattungen in übergeordneten Gruppen, wie der Seenkoordinatoren-Gruppe oder ECOSTAT.

3.1 Seenmakroinvertebrateninterkalibrierung im CB- und AL-GIG, sowie GIG-übergreifend

In der Funktion des GIG-übergreifenden Leiters der Seeninvertebrateninterkalibrierung vertrat ich die vier GIG-Gruppen in den übergeordneten und assoziierten Gremien und koordinierte deren Arbeiten. Als koordinativer und wissenschaftlicher Leiter der CB-Gruppe koordinierte ich außerdem die Arbeiten dieser Untergruppe. Dies bedeutete insgesamt einen regen Emailaustausch mit einer Vielzahl von beteiligten Personen.

Im CB- und AL-GIG standen zunächst Korrekturen und Erweiterungen der Datenbank als Voraussetzung für alle Arbeiten im Vordergrund. Die Datenaktualisierungen erfolgten in heterogenen Formaten, die vereinheitlicht und in der gemeinsamen Datenbank zusammengeführt werden mussten. Im Laufe der Zeit führte ich zunehmend auch Datenauswertungen durch.

Im Folgenden wird ein Überblick über die Arbeiten gegeben. Weitergehende Details finden sich in den Protokollen der Sitzungen (**Anhänge 8.1 und 8.2 fürs CB-GIG, 0 fürs AL-GIG, 8.3 und 8.4 für die Großen Flüsse**) sowie in den Berichten an ECOSTAT (Milestone-report; **Anhang 8.6 fürs CB-GIG**).

CB-GIG

Der Datenbestand wurde auf 991 Proben von 873 Probestellen in 197 Seen aus 9 Ländern erweitert.

Insgesamt befanden sich 1191 Taxa in der Datenbank. Die taxonomische Auflösung hängt von der Makrozoobenthosgruppe ab: Überwiegend Familienniveau für Chironomiden und Oligochaeten, gemischte Niveaus für Mollusken und überwiegend Artniveau für die weiteren Gruppen.

Für die ersten Analysen wurden die Taxa mittels der operationellen Taxaliste Deutschlands harmonisiert. Für die weiteren Analysen wurde diese Harmonisierungsliste an alle Länder verteilt, um eine abgestimmte Liste zu erhalten. Diese Abstimmung wurde im Oktober beim Treffen in Aalst vorgenommen. Dabei wurde der Filter mit folgende Änderungen beschlossen: Familienlevel für Chironomidae; Ordnungslevel für Oligochaeta und Polychaeta.

Ein Großteil der Analysen zur Auswahl der sogenannten „Common Metrics“ wurde in Zusammenarbeit mit dem EU-Projekt WISER vorgenommen und durch dieses finanziert.

Zur Auswahl der Kandidaten für die Interkalibrierungsmetrics wurden ca. 80 Metrics berechnet und gegen nationale Bewertungsergebnisse (EQRs) und Belastungsfaktoren korreliert.

Für die nationalen Bewertungsergebnisse der meisten Länder ergaben sich gute Korrelationen mit der Taxazahl sowie mit sensitiven taxonomischen Gruppen (z.B. %ETO und Anzahl der Taxa an ETO oder EPTCBO).

Die Korrelationen mit den Belastungsfaktoren variierten zwischen den Ländern, wahrscheinlich aufgrund der Unterschiede in der Belastungssituation sowie der Besammlungsmethodik. Insgesamt reagierten eine Reihe von Metrics jedoch erwartungsgemäß auf die verschiedenen Belastungsfaktoren.

Als Kandidaten wurden daher vorläufig folgende Metrics ausgewählt:

% Odonata (bezogen auf Individuen), % ETO (bezogen auf Abundanzklassen), ASPT, Taxazahl, % Indifferente (bezogen auf Abundanzklassen), % R/K Strategen (bezogen auf Abundanzklassen), Anzahl Taxa an EPTCBO (oder ETO), % Crustacea (bezogen auf Individuen) sowie % Lithalbewohner (bezogen auf Individuen).

Die endgültige Auswahl der Kandidatenmetrics wird beim ersten Treffen in 2011 mittels GIG-Gruppen-Entscheidung erfolgen, hauptsächlich auf der Basis der Korrelationen mit den nationalen Methoden.

Bezüglich der Durchführbarkeit der Interkalibrierung wurden die entsprechenden Fragen der Interkalibrierungsleitlinie diskutiert:

1) Nach Einschätzung der GIG-Gruppe erfüllen die nationalen Methoden die Anforderungen der WRRL. Dies muss jedoch noch im Detail belegt werden.
2) Die Interkalibrierung ist prinzipiell durchführbar, da alle außer zwei Methoden auf das Eulitoral und hydromorphologische Belastungen fokussieren. Für die anderen Methoden wird ein Vergleich zu Eulitoralproben angestrebt.
3) Die Ländermethoden sind unterschiedlich (= Ausschluß Interkalibrierungsoption 1).
4) Die Probenahmemethoden sind zu unterschiedlich für die Interkalibrierungsoption 3.
5) Die Entwicklung der Common Metrics ist auf einem guten Weg
6) Es gibt zu wenige Referenzseen für einen Referenzabgleich auf Ebene der Gesamtgewässer; eventuell könnte es genügend Referenzen auf Probestellenebene geben.
7) Das Setzen der Grenzen für die Bewertungsklassen der nationalen Methoden scheint für alle Methoden die Anforderungen der WRRL zu erfüllen. Sollte die Detailprüfung dies bestätigen so könnten die nationalen Klassengrenzen direkt auf der Common-Metric-Skala verglichen werden.

AL-GIG

Trotz laufender Analysen wurde die internationale Datenbank ständig weiter aktualisiert. Außerdem wurde begonnen Belastungsparameter auf Probestellenebene zu sammeln, um die statistische Aussagekraft zu erhöhen.

Frankreich konstatierte, dass es bis zum Ende der aktuellen Interkalibrierungsrunde kein Verfahren mehr entwickeln werde. Stattdessen werde es die Interkalibrierungsmetrics als nationales Verfahren übernehmen, falls diese für die nationalen Typen anwendbar sein würden. Auch Italien plante, die Interkalibrierungsmetrics zu übernehmen.

Es wurde beschlossen, die Interkalibrierung zweigleisig laufen zu lassen:

Auf der ersten Schiene werden die eulitoralen Verfahren von Slowenien und Deutschland interkalibriert, die in diesen Ländern als offizielle Verfahren vorgesehen sind.

Auf der zweiten Schiene werden Interkalibrierungsmetrics fürs Sublitoral entwickelt. Da hierfür nur das Bewertungsverfahren Deutschlands existierte, das derzeit nicht als offizielles Bewertungsverfahren vorgesehen war, müssen die Klassengrenzen für die ökologischen Zustandsklassen gemeinsam abgeleitet werden, und können dann mit den deutschen Klassengrenzen abgeglichen werden.

Es wurde beschlossen, hydromorphologische Veränderungen als Belastungsfaktor zu betrachten. Die Gruppe war sich bewusst, dass Makroinvertebraten auch auf Sekundäreffekte der Eutrophierung reagierten, jedoch könne dieser Stressor effizienter und kosteneffektiver mit Phytoplankton oder Makrophyten/Phytobenthos bewertet werden.

Für die Ableitung der Interkalibrierungsmetrics wurden fünf zunächst fünf Harmonisierungsvarianten der Taxalisten beschlossen:

1) die unveränderten Rohdaten; 2) Gattungsebene; 3) Familienebene; 4) alle unverändert bis auf Tribus für Chironominae, Unterfamilie für weitere Chironomidae und Familie für Oligochaeta; 5) wie zuvor, aber Gattung für die nicht genannten Gruppen.

Nach deren Vergleich und der endgültigen Auswahl der Metrics sollte eine der Varianten zur Durchführung aller Interkalibrierungsberechnungen ausgewählt werden.

Die Ableitung der Interkalibrierungsmetrics war zum Ende des Berichtszeitraumes noch in Arbeit, jedoch zeichneten sich ähnliche Metrics wie im CB-GIG ab.

3.2 Große Flüsse

Die Interkalibrierungsarbeiten zu den großen Flüssen begannen im September 2009. Zunächst stand die Datensammlung im Vordergrund. Einige Pilotanalysen zur Planung des Vorgehens wurden jedoch schon mit der unvollständigen Datenbank vorgenommen.

Nachfolgend wird ein Überblick über die Arbeiten und Beschlüsse im Berichtszeitraum gegeben. Weitere Einzelheiten werden aus den Protokollen des zweiten und dritten Treffens ersichtlich (**Anhänge 8.3 und 8.4**).

Insgesamt wurden bis zum Ende des Berichtszeitraums 1752 Probenahmen aus 314 Gewässerstellen in 17 Ländern mit insgesamt rund 50000 Taxadatensätzen vereinheitlicht und in die Datenbank integriert. Leider wurden die zur Verfügung gestellten Datenschablonen nur sehr ungenau eingehalten. eine Aufgrund der heterogenen Datenformate und zahlreicher Codierungsfehler für die Probestellen, Probenahmen und Taxa nahm die Datenbearbeitung bislang den allergrößten Teil des Arbeitsaufwandes ein.

Aufgrund der Datenlage wurden folgende Beschlüsse gefasst:

Die Interkalibrierung sollte nur für Makroinvertebraten und Diatomeen (je 11 nationale Verfahren) durchgeführt werden.

Für die Makroinvertebraten waren die Probenahmeunterschiede der Länder zu gravierend, um die Bewertungsverfahren der Länder auf Daten anderer Länder anzuwenden. Somit waren die Interkalibrierungsoptionen 1 und 3 auszuschließen. Es verblieb Option 2, die Interkalibrierung mittels gemeinsamer Interkalibrierungsmetrics. Eine Vorauswahl von 7 Kandidaten dieser Metrics erfolgte in einem separaten Auftrag der BFG aufgrund der Korrelationen mit den morphologischen Belastungsparametern (Böhmer, 2010). Für diese Metrics wurden länderspezifische Standardisierungen vorgenommen, um dann Referenzbedingungen abzuleiten.

Für die Diatomeen sind die Probenahmen einheitlicher, so dass die Durchführung der Interkalibrierungsoption 3 angestrebt werden konnte. Allerdings war zum Ende des Berichtszeitraumes noch nicht absehbar, ob es gelingen würde, hierfür die Gewässer nach allen länderspezifischen Gewässertypisierungen einzustufen und alle nationalen Verfahrensergebnisse für die Probenahmedaten zu berechnen. Andernfalls müssten auch für die Diatomeen Interkalibrierungsmetrics gemäß Option 2 eingesetzt werden.

Sowohl bei den Makroinvertebraten als auch bei den Diatomeen stellt die Ableitung von Referenzbedingungen eine große Herausforderung dar, weil fast alle Länder keine Referenzgewässer besaßen. Auch das „Alternative Benchmarking“ scheiterte bislang am Problem, dass die Länder jeweils nur einen kleinen Teil des Belastungsgradienten abdeckten . Daher schlug ich vor, die Standardisierung der Interkalibrierungsmetrics nicht über „Benchmarks“ sondern mittels der Gesamtdaten im Belastungsgradienten (sogenannte Dosis-Wirkungsbeziehungen) vorzunehmen (vgl. Präsentation im nachfolgenden Kapitel 3.3).

Nach der Standardisierung mittels dieser Dosis-Wirkungsbeziehungen könnten die Daten aller Länder zusammengefasst werden, um eine Normalisierung der Interkalibrierungsmetrics mittels eines beliebigen Punktes auf der Dosis-Wirkungskurve (Benchmarking) oder mittels abgeleiteter Referenzwerte vorzunehmen. Die Exaktheit der Referenz spielte in diesem Falle keine Rolle, weil die Referenz für alle Länder dieselbe wäre (in Bezug auf die standardiserten Metrics).

Sowohl für die Makroinvertebraten, als auch für die Diatomeen wurde die Standardisierung der Interkalibrierungsmetric-Kandidaten sowie die Ableitung von Referenzbedingungen mit einem vorläufigen Datenbestand vorgenommen (Böhmer, 2010). Falls die skizzierte Vorgehensweise beim Treffen im Februar 2011 Zustimmung fände, müssten die Berechnungen mit dem endgültigen Datenbestand wiederholt werden.

3.3 „Guidance“ zur Interkalibrierung

In meiner Funktion als Seenmakroinvertebratenkoordinator trug ich zur Gestaltung des Interkalibrierungsleitfadens („Intercalibration Guidance“) bei. Diese Mitarbeit erfolgte über Stellungnahmen zu den Entwurfsversionen, durch aktive Teilnahme beim Workshop zum Anhang „Comparabilty Criteria“ sowie auch als Diskussionsbeiträge in der ECOSTAT-Sitzung in Brüssel.

Beim Workshop zu den Comparability Criteria präsentierte ich den Vortrag „Approaches to set Reference Conditions“, der nachfolgend in gekürzter Fassung wiedergegeben wird. Hierbei wurden verschiedene Möglichkeiten zur Referenzfindung und zum „Benchmarking“ vorgestellt, welche zur Anwendung kommen könnten, wenn die in der Guidance beschriebene Vorgehensweise aufgrund schwieriger Datenlage nicht anwendbar ist (z.B. bei großen Fliessgewässern, die für jedes Land nur einen kleinen Teil des gesamten Belastungsgradienten abdecken):

Reference Criteria: Example CB Lake Benthic Fauna

	Criteria (1)
Catchment characteristics	(1) Reference threshold > 85 % nature (i.e. "natural" forests, wetlands, moors, meadows, pasture); NOTE: Rejection threshold = 70 %
	(2) No intensive crops (incl. vines) within in the near surroundings (i.e. within a zone of 200 m from the lake shore)
	(3) ≤ 5 % urbanisation and peri-urban areas in the near surroundings (i.e. within a zone of 200 m from the lake shore)
	(4) No direct inflow of treated or untreated waste water
	(5) Impact of wastewater from scattered dwellings low (i.e. < 10 inhabitants km^{-2}) within the whole catchment
Morphology	(6) ≤ 5 % artificial modification of the shore line
Trophic state	(7) Generally: No (or insignificant) deviation of the actual from the natural trophic state
Other pressures	(8) No mass (or significant) recreation activities (camping, swimming, roing, coarse fish angling, put and take angling, releasing and feeding of ducks for hunting)
	(9) No actively invading (and reproducing) plant or animal species that may negatively impact the structure, productivity, function and diversity of the ecosystem
	(10) no evidence for one of the following pressures: - Significant changes in the hydrological and sediment regime of the tributaries (larger than the range between the natural mean low water level and the natural high water level) - Fish farm activities or other fishing operations that negatively impact the structure, productivity, function and diversity of the ecosystem - Introduction of non-native fish species, unless their abundance and biomass is insignificant - Sigificant changes in status parameters prior to major changes in industrialisation, urbanisation and intensification of the agriculture - Substances mentioned in Annex X and/or in annex VIII of the WFD in concentrations above the limits of detection of the most advanced analytical techniques in general use or presence of possible and important sources of pollutants. - Measured values of other anthropogenic, synthetic substances above quality objectives and not near natural background concentrations, except for those from atmospheric sources

Criteria similar in AL-group; both oriented at Plankton IC and Refcond

Problem:
Few candidate reference lakes and incomplete data
- only about 10-15 lakes remain

References Large Rivers

- only existent in few countries
- major problem for the derivation of reference conditions and for the whole intercalibration exercise:
  Most countries cover only a small part of the pressure gradient

Reference Condition Sampling Sites to get more reference data

References on sampling site level instead of water body level (e.g. near natural shore stretches in non-eutrophicated lakes)

- advantage:
  - more references
- disadvantages:
  - requires site level pressure data
  - sites might be influenced by adjacent impacted sites
  - only possible when biological assessment works on sampling site level
- probably we will not succeed to get these data in IC phase 2

Alternative Benchmarking

Requirements:

- Pressure data representing all relevant factors (chemistry and hymo for benthic fauna)
- A range on the pressure gradient with sufficient data sets for all countries

Problems:

- Results vary in dependence of the factors
- Easy if a single factor is relevant (e.g. TP for Diatoms), but how to combine several factors (e.g. TP, BOD, %modified shoreline, navigation intensity)?
- different countries cover different ranges of the pressure gradient ➔ no benchmark with sufficient data for all countries for Large Rivers as well as Lake BF

➔ outcome strongly depends on the selection and combination of the pressure data

Other possibilities to derive reference conditions

Extrapolation:

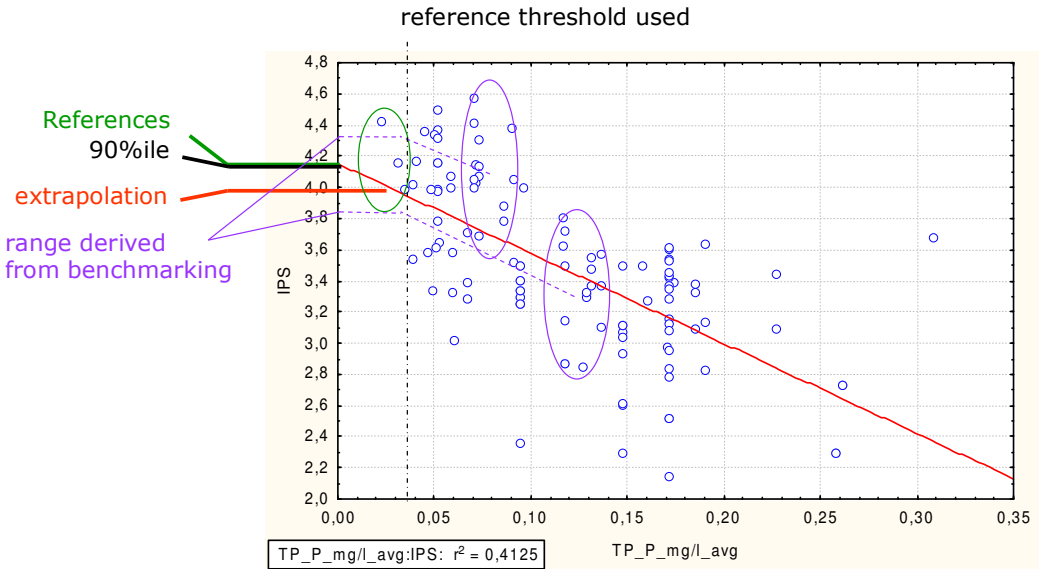
- the regression line between pressure factor and metric value is extrapolated to the reference threshold
- requires good correlations, but often the pressure gradient is not sufficiently covered;
- also somewhat dependent on the factor or factor combination selected

Percentiles:

- for each metric the best 10% are seen as reference values;
- assumes that there are at least some sites in high biological status, or at high status for the metric under consideration

Comparison of different approaches to derive reference conditions

- Example for Diatoms/IPS and TP in Large rivers



Comparison of different approaches to derive reference conditions

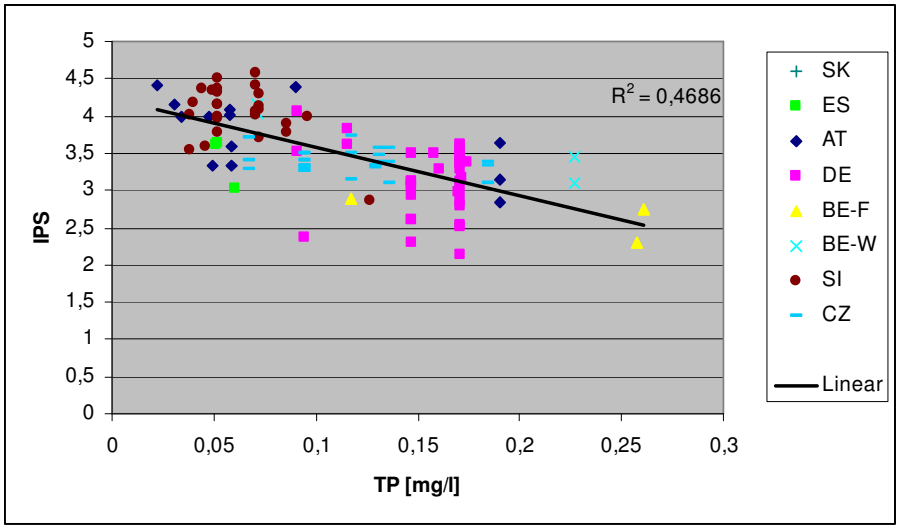
- All approaches except the percentiles are influenced by various factors and decisions
- As a consequence this influence is bigger than the differences between the approaches

➔ All approaches seem to work if there is sufficient sites (see example)!

But the example is for all countries together

➔ must be be split up by countries or even further by national types to obtain specific reference conditions!

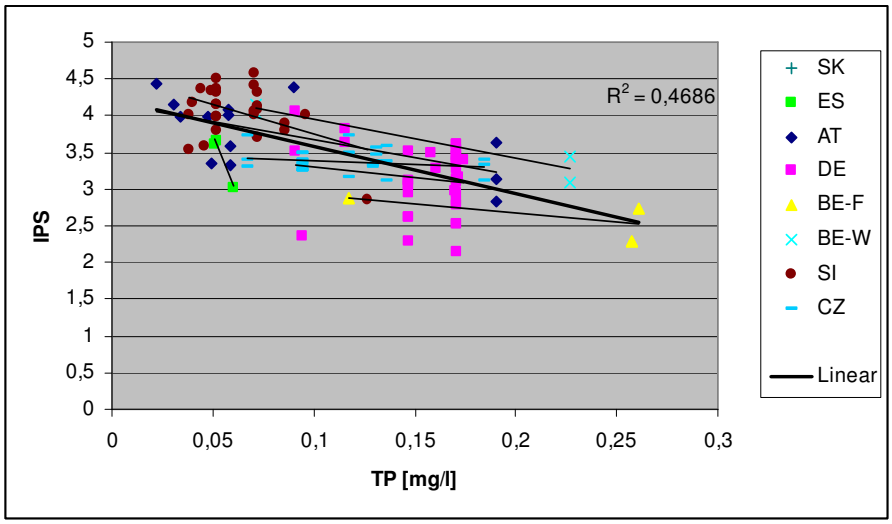
Problems deriving reference conditions
- Example for Diatoms/IPS and TP in Large rivers



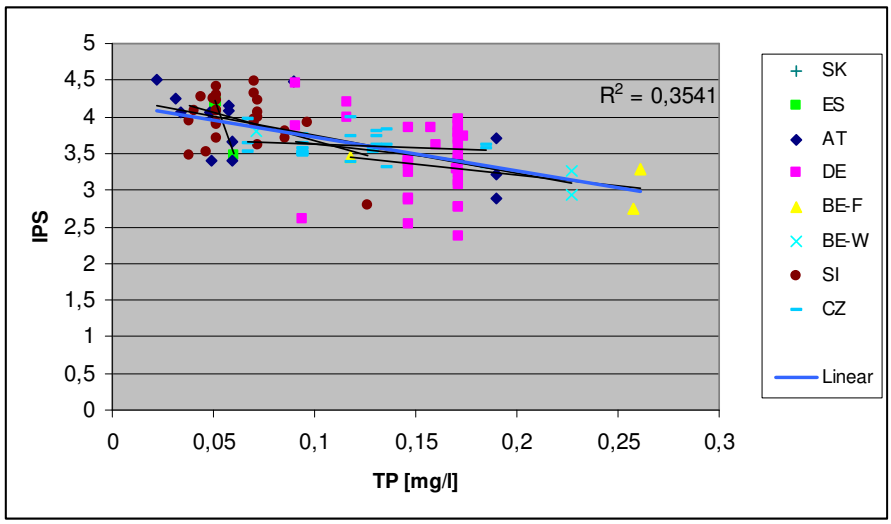
Most countries cover only small parts of the gradient and few sites for some countries

➔ All options to derive reference conditions are problematic!

Problems deriving reference conditions
- Example for Diatoms/IPS and TP in Large rivers



Alignment of Regression Lines by Metric Standardisation = "Multiple Benchmarking"
- all Countries after Standardisation



Resulting factors:	DE	BE-F	BE-W	CZ	ES	SI	SK	AT
	1,1	1,2	0,945	1,07	1,15	0,98	1	1,02

Metric Standardisation and Normalisation

- Multiplikation with country specific factor or addition of an offset ➔ standardised metric
- Derivation of Common Reference for standardised common metric
- Division by common reference value ➔ normalised common metric, expressed as EQR from 0 to 1
  (precision of common reference value does not influence the comparison between countries, because it is the same factor for all)
- Several normalised Metrics can be averaged to a common multimetric index (as EQR from 0 to 1)

Conclusions

- The derivation of a reference condition is very problematic for large rivers as well as for lake benthic invertebrates
- The percentile approach seems to be the best and most robust reference approach for lake benthic fauna
- Another option is the alignment of dose response curves (“multiple benchmarking”), which seems to be the only solution for the large rivers

3.4 WISER-Kooperation

Wie im Vorjahr wurde die Koorperation mit dem EU-Projekt WISER fortgeführt, das u.a. die wissenschaftliche Unterstützung der Interkalibrierung zum Ziel hat. Die Unterstützung bei der Erarbeitung der Interkalibrierungsmetrics wurde in den vorigen Kapiteln bereits erwähnt.

Im Rahmen der Kooperation wurden WISER-Vertreter zu allen Seeninvertebraten-IK-Sitzungen eingeladen.

Ferner fand ein Datenaustausch statt.

4. Zusammenstellung nationaler Daten zur Interkalibrierung

Insgesamt wurden deutsche Daten zu allen Biokomponenten der großen Fließgewässer sowie Makrozoobenthosdaten für die Seeninterkalibrierung zusammengestellt. Der Schwerpunkt bei der Bearbeitung der nationalen Daten lag bei der Vervollständigung fehlender Parameter (insbesondere Uferstruktur der Seen).

Für die Voralpenseen kamen auch viele neue biologische und abiotische Daten hinzu.

Die Bearbeitung erfolgte in enger Zusammenarbeit mit dem parallel durchgeführten LAWA-Projekt zur Weiterentwicklung der Makrozoobenthosbewertungsverfahren der Seen (Projektleitung IGB Berlin).

5. Überarbeitung der Internetpräsenz zur Interkalibrierung

Die Internetpräsenz www.Interkalibrierung.de war 2006 eingerichtet worden.

Sie dient der allgemeinverständlichen Darstellung von Grundlagen, Hintergründen, wissenschaftlicher Umsetzung, abgeschlossenen Ergebnissen und weiterführenden Informationsmöglichkeiten.

Im Berichtszeitrum fielen kaum Änderungen an, weil abgeschlossene Interkalibrierungs-ergebnisse erst Ende 2011 zu erwarten sind.

6. Arbeiten zur Interkalibrierungsdatenbank

Die Interkalibrierungsdatenbank beinhaltet Informationen über die Probenahmen und Gewässerstellen, welche im Rahmen der Interkalibrierungsarbeiten zum Einsatz kamen, jedoch keine Taxadaten oder abiotsiche Begleitdaten. Sie dient daher auch nicht der Sammlung und Bereitstellung der für die laufenden Expertenarbeiten benötigten Daten, sondern dem Überblick über die Interkalibrierungs-Gewässerstellen Deutschlands.

Gemäß den Absprachen bei den UBA-Interkalibrierungstreffen sollten nach Möglichkeit die Parameter GIG, Biokomponente, Stellenbezeichnung, Koordinaten, Interkalibrierungstyp, nationaler Gewässertyp, Probendatum oder Probencode, nationales Bewertungsergebnis (Zustandsklasse + evtl. mehrere Indices) und Interkalibrierungsbewertung (z.B. die Common Metrics) erfasst werden.

Da die Arbeiten der verschiedenen Interkalibrierungsgruppen Deutschlands in vollem Gange waren, und niemand absehen konnte, welche Daten 2011 in der endgültigen Interkalibrierung verwendet werden würden, fielen nur wenige Aktualisierungen an.

Ende 2011, nach Abschluß der Interkalibrierung, werden umfangreiche Aktualisierungsarbeiten anfallen.

7. Literatur

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8. Anhang

8.1 Ergebnisprotokoll des Seen-Makroinvertebraten-CB-GIG-Treffens in Tartu (Originaltext)

Minutes CB-GIG lake macroinvertebrates meeting

Tartu (Estonia), June 16-17, 2010

Participants

Henn Timm (Estonia, host)
Kestas Arbaciauskas (Lithuania)
Juergen Boehmer (Germany; chairman)
Bart Reeze (Netherlands)
Wim Gabriels (Flanders, Belgium)

Absent

Malgorzata Golub (Poland), Peter Wiberg (DK), Andris Ceirans (LV) due to lack of funds.
Ben McFarland (UK) changed his job to a private company. Geoff Phillips (UK) provided the name of a new delegate: Richard Hemsworth. Unfortunately Richard wasn't able to attend due to change of delegate and lack of funding.
Gwendolin Porst (WISER project), because another meeting in the USA.
Lionel Mazella (FR) without message.

Action list

Responsible	Action	By
Juergen	Send around format milestone report	Asap
All	Fill in format milestone report for compliance of national methods (chapter 4 of milestone report)	August
All	Check compliance of national methods with boundary setting protocol (see annex IV of IC guidance)	August
All	Read IC guidance (step Q6, benchmarking annex III and comparability criteria annex V)	September
All	Check data on questions about international typology (questions based on mean depth)	June
Kestas	Revise submitted and add new data with emphasis on reference lakes	June
Wim	Expand and revise data in dataset	June
Juergen	Ask LV delegate to reconsider reference lakes and supply information about reference criteria	June
Juergen	Send around list for harmonisation of taxonomic level	June
Juergen	Ask Peter to contribute to first multivariate analysis	June
Bart/ Peter	First rough (multivariate) analysis of data (if funds are sufficient)	September
Juergen	Selection of metrics for the common metric	July
Juergen	Give suggestions for common metric	July
Kestas	Send around a list of invasive species (as a proposal)	July

Agenda

1. Welcome
2. Status of national methods
3. Status of data collection
4. Compliance of methods
5. Intercalibration process (based on new IC guidance)
6. Discussion on boundary setting protocol (annex IV of IC guidance)
7. Results: towards a common metric
8. Other discussion points
9. Workplan and next meeting(s)

Wednesday, June 16, 2010

1. Welcome, overview

Henn Timm (EE) gives short overview of Estonian lakes. Contrary to most European 'brown'lakes, some brown lakes in Estonia may be very well buffered.

The agenda is approved. The minutes of the Vilnius meeting are approved.

2. Status of national methods

Germany: the national method is under revision. Method is nationally accepted. Only class boundaries have to be set. Descriptions only available in German. Assessment on site-level, lake assessment based on weighted averaging.

Lithuania: still no national method. Method is still under construction. Main problem is lack on representative data on lakes. Data are being collected.

Estonia: developed a national typology. For each type reference situations were found. National method is official and accepted, further improvements are possible. Descriptions only available in Estonian. Assessment on site-level (one site per lake).

Flanders (Belgium): method is official and published. Assessment on site-level, lake assessment based on averaging.

Netherlands: the method is finished and at the moment it is not being further adjusted. Assessment on site-level, lake assessment based on weighted averaging.

3. Status of data collection

Currently in the database:

Belgium: 12 lakes. Important missing data data will be added (mean depth, CB typology, landuse, nutrients). For 6 lakes new samples on species level are available. Data to genus/ family level.

Germany: 138 lakes. Data of 53 lakes are consistent, only those lakes might be used for analysis. Major problem is chemistry. Other data more or less complete. Landuse has to be completed. All data to species level (53 lakes), except for chironomids and oligochaeta. Other lakes mixed id-level. Probably the analysis should be limited to the set of 53 lakes.

Estonia: 20 lakes. Data are quite complete, no actions needed. Some extra data for shoreline alteration will be added. Data to species level, except for chironomids, oligochaeta and watermites.

Great-Britain: 35 lakes, about 20 lakes littoral and CPET data available. Data quite complete, no action needed. Littoral data to species level, except for chironomids and oligochaeta.

Lithuania: 10 lakes. Some important data are missing (landuse, shoreline alteration (%)). New data are available and will be sent within a month (including missing data).

Latvia: 23 lakes. Important missing data are landuse (surroundings (100-300m)) and shoreline (15 m)) and shoreline alteration (%).

Netherland: 32 lakes. Missing data are mean depth (not available). All data to species level.

Poland: 6 lakes (WISER-data). Shoreline alteration (%) is missing.

Denmark: 17 lakes, stressor data incomplete;

Not in the database:

France: sent data for sublittoral and profundal. Parallel eulittoral samples will be needed for intercalibration.

4. Compliance of methods

The milestone report provides a good format to check the compliance of national methods (chapter 4). It was agreed that everybody fills in this format before the end of august (see action list).

5. Intercalibration process (based on new IC guidance)

Q1: compliance of methods. See point 4 and action list.

Q2: Feasability check. Done in the beginning of the process: we focus on eulittoral and hydromorphological pressure. Some methods are not similar (CPET and French method). For those methods parallel data were collected (eulittoral and specific data for the methods).

Q3: All countries have different assessment methods so far.

Q4: The sampling is different in most countries. Furthermore the Dutch method is the only method requiring identification to species level for chironimids and oligochaeta. The data of other countries only provide family-data. Conclusion: option 2 is most favourable. Nevertheless we will give option 3 a try.

Q5: First results show weak correlations between national methods and metrics possibly to be included into the common metric. The Dutch method seems to perform well in correlations with pressure data and possible metrics.

Q6: There might be enough sites for reference conditions if we agree to assess at a site level. There are not enough reference lakes for intercalibration at a lake level. Description of reference biological communities will probably be desribed at the level of values for the (common) metrics at reference conditions.

Q7: Compliance of boundary setting of national methods. The boundary setting seems to be WFD-compliant for all available methods, which would bring us to a direct comparison of national classifications. Description of biological communities representing moderate deviation from reference conditions will be desribed at the level of values for the (common) metrics at the good-moderate boundary.

6. Discussion on boundary setting protocol (annex IV of IC guidance)

Estonia: Henn Timm explains boundary setting for the Estonia method. The boundary setting is based on a practical view on possible scores for the sum of the five metrics.

Germany: all metrics were related to pressure data.

Belgium: the reference value for the method was set based on maximum scores (expert judgement) for the individual metrics. Initially, the range of the method was devided into five equal classes. Based on the river IC exercise the classes were upgraded a little bit.

Netherlands: boundaries are derived from a theoretical reference and deviding the range into five equal classes. There has been no comparison with pressure data yet. The pressure data from the current IC database provide a good basis for that.

7. Results: towards a common metric

The common metric will be based on a numer of ASTERICS metrics (and a number of others). Correlations were carried to identify metrics for the common metric. The common metric needs a good correlation with stressor parameters and national EQR's. Correlations were carried out between;

- Stressors x possible metrics
- National EQR's x possible metrics;
- (Stressors x national EQR's).

There are a numer of possible metrics which perform well for correlations with stressors and national EQR's:

- % Odonata (individuals) (composition/ tolerance);
- % ETO (abundance classes) (composition/ tolerance);
- Number of sensitive groups (diversity/ tolerance);
- Numer of taxa (diversity);

- ASPT (tolerance);
- % Indifferent species (abundance classes) (functional/ guild);
- % R/K Strategists (abundance classes) (functional).

Discussion for further analysis:

- Level of comparison: site level or lake level. All available assessment systems are operating at site level. The WFD however requests a comparison at waterbody-level. The abiotic data are available at lake level too. Decision: use site level, show the results are valid for lake level as well;
- Building of common metric: how to proceed. Metric values might be biased between countries due to different ways of sampling and data processing. Normalisation (dividing metric values by reference values) will presumably level this bias out. So to enable the selection of the right metrics we need to select reference sites first. This seems to be difficult at this stage. Decision: normalisation will be carried out based on 90-percentile metric values for the whole dataset (and dataset per country which provides calculation factors);
- Still we need reference sites later on in the process. Due to the lack of reference data we will calibrate results of modelling with actual data from reference sites;
- After selection of possible metrics intercorrelation (covariation) between the possible metrics need to be checked. Then select metrics which describe the relation with stressors best.

Thursday, June 17, 2010

8. Other discussion points

Taxonomic level: some harmonisation on the taxonomic level is needed for metric calculation and multivariate analysis. For example:

- Chironomids and dipterans on family level;
- To be excluded: zoöplankton, fish, Acari, Ostracoda, meiofauna (nematods)

Juergen will send around an existing list which for discussion.

Some basic data-analysis needs to be done to check coherence of the data, outliers, typology, reference sites, etc. A good way to explore the data is a multivariate analysis (correspondal analysis).

Juergen will ask Peter Wiberg to contribute in a first multivariate analysis.

There are no reasons to change the current typology so far (CB1 and CB2). There are not enough data to include CB3. Maybe the multivariate analysis will provide new input for the typology discussion.

Invasive species. We need a list of invasive species to set op a metric on biocontamination (as a check for interference with metric scores). A list will be set up for catchment within Europe (group Phil Boon), but this might take a couple of years.

Kestas will distribute a list of invasive species (as a proposal). This list needs to be extended/ checked by the rest of the group.

9. Workplan and next meeting(s)

Workplan

Next steps are:

- Finalisation of the dataset (new data, international typology);
- Harmonisation of taxonomic level;
- Reconsider reference lakes and supply information about reference criteria;
- First rough (multivariate) analysis of data;
- Selection of metrics for common metric;
- Building common metric.

See action list.

Next meetings

The next meeting will take place on October 20, 21 in Aalst (Flanders), hosted by Wim Gabriels.

Action list NL (specific)

Wie	Wat	Wanneer
Bart	Check correlaties maatlat NL x pressure data IC database	
Bart	Check internationale typologie (bijvoorbeeld M20 met geringe diepte die tot CB1 worden gerekend)	

8.2 Ergebnisprotokoll des Seen-Makroinvertebraten-CB-GIG-Treffens in Aalst (Originaltext)

Draft minutes CB-GIG lake macroinvertebrates meeting

Aalst (Belgium), October 20-21, 2010

Participants

Kestas Arbaciauskas (Lithuania)
Rachel Benstead (UK)
Jürgen Böhmer (Germany; GIG leader)
Wim Gabriels (Flanders-Belgium)
Gwendolin Porst (WISER)
Bart Reeze (the Netherlands)
Henn Timm (Estonia)

Denmark, Poland and Latvia cannot attend due to funding problems. We will of course keep them informed of all developments.

Minutes

1. Welcome by Mr. Rudy Cautaerts, head of Department Water Monitoring

2. Approval of agenda; aims for the present meeting; approval of the minutes of the previous meeting; election of meeting secretary (for the minutes)

Agenda is approved, with the addition of one item (WISER presentation).

Meeting secretary: Wim

Jürgen gives an overview of the minutes from the Estonia meeting (drafted by Bart):

Milestone report needs to be updated; later on everyone will have to answer all questions regarding compliance check. Data from Kestas are not submitted yet. Wim has sent data. No response from Latvia about reference lakes. List for harmonisation of taxonomic data was distributed by Jürgen. The list of invasive species was distributed by Kestas. We will intercalibrate at site level as most countries assess at site level.

The minutes are approved.

3. Feedback from ECOSTAT meeting: Milestone 3, deadline of second intercalibration round, intercalibration guidance Annex V

Annex V was approved by ECOSTAT (and will probably be approved by the water directors as well).

Deadline for the GIGs for the second intercalibration round is june 2011 (Milestone 5).

4. WISER presentation by Gwendolin

Final report on deliverable 3 (assessment of European lakes using benthic macroinvertebrates, i.e. developing of common metrics using WISER data set as well as GIG data) is due 28 februari 2011. The final deadline for WISER is 29 march 2012.

5. WFD compliance of national methods

Situation for all countries is the same as during last meeting.

Milestone 3 report is used as template for milestone 4. The different questions of the Milestone (points 1-4) are discussed and updated where necessary.

For question 3 (method compliance check):

-UK must write a response to question 3 and 8 (parameters included)

-all countries must list their national types and state whether they are compliant with Annex II (provide a conversion table from national types to common types if possible)

6. Harmonisation of identification level (German taxa harmonisation filter)

The harmonisation filter is approved with a number of modifications:

-Chironomidae are set to family level;

-Oligochaeta are set to order level;

-Polychaeta remain at order level;

-all mites, copepods, ostracods, hydrozoans and bryozoans are ignored.

Jürgen will send the new database and the updated version of the harmonisation filter to everyone by the end of october.

7. Database: available data, stressors, metrics (...)

Presentation by Jürgen about the database:

-9 countries

-197 lakes

-873 stations

-991 samples

In total 1191 taxa. Taxonomic resolution varies depending on group; they were harmonised using an operational taxa list from Germany.

In order to select candidate metrics, metrics were correlated against national EQRs. Good results are found for several metrics.

Stressor parameters were correlated against individual metrics. Which metrics give the strongest correlations, depends on the dataset used (combined or for single countries). Some metrics seem to respond differently in different countries:

-number of EPTCBO taxa (or ETO)
-ASPT
-% Odonata individuals
-% ETO (in relation to abundance classes)
-rk-index (ratio r-strategists vs. k-strategists)
-% habitat preference lithal individuals
-% indifferent individuals
(-% Crustacea individuals)

The final selection of metrics should depend on correlation of the metrics with national EQRs and with pressures, and on acceptance by countries.

Kestas will try to update the Lithuanian data and send it to Jürgen ASAP.

8. Selection of common metrics, reference conditions/alternative benchmarking

In order to combine metrics, the metrics values need to be rescaled to the interval (0-1), ("normalised"). For this purpose, we need reference (or benchmark) values for each metric. This can be done by using a correlation of the metric against e.g. total P and convert the value of P which is considered reference into the corresponding value of this metric. A similar approach would be to use a "benchmark" value: e.g. a different P value which is assigned a certain EQR value instead of the reference (e.g. 0.6 instead of 1). A different, but more robust, approach is using the 90th percentile of a metric as reference value.

When different countries have a different correlation between pressures and metrics, multiple benchmarking could be considered, which would mean shifting the correlation curve in such a way that a similar pressure level (e.g. a certain total P-value) always corresponds to the same metric value. This could be advantageous since taxa richness seems to be biased between countries, presumably partly due to differences in sampling effort.

The agreed next steps are:

-harmonisation of taxa lists to produce the new data set

-normalising all metrics by dividing the values by the 90th percentile (e.g. metric value at the 90th percentile becomes 1)

-selection of different combinations of metrics (initially using a weighting factor of 1 for all metrics)

-comparing the multimetric indices with the pressures and the national EQRs

Option 3 seems doesn't seem to be very promising with our data (due to suspected differences in sampling effort), and also it's quite time-consuming. Therefore we decide to use option 2.

9. Boundary setting

We can either use the average of the boundaries or the median. The median will be affected less by changing boundaries. The final decision on boundary setting methods can be taken at a later stage (after finalising the common metric).

10. Compilation of alien species lists

Kestas has compiled and distributed a list of alien species. Several countries have indicated in this list which ones are present in their country. However, some species are alien in one member state (e.g. *Astacus astacus* in UK) but native in other member states.

Only species should be considered which are also in the taxa list used for calculating the common index.

A number of indices assessing alien impact can be calculated:

ACI (Abundance Contamination Index) = number of individuals of aliens / total number of individuals

RCIo (Richness Contamination Index at order rank) = number of alien orders present / total number of orders identified

RCIf (Richness Contamination Index at family rank) = number of alien families present / total number of families identified

Based on the list Kestas distributed earlier, we will compile a list of alien species with indication of nativity (native or alien) for member states.

Jürgen will ask Jochen Vandekerkhove which (black)list(s) they use to assess impact of aliens.

Kestas will check the national databases (from the ECOSTAT questionnaire report) in order to update our list.

By december 2010 Kestas will distribute a draft list of all candidate alien species, each country has to indicate which ones are native to their country.

Jürgen will check with Daniel Hering (WISER) about the availability of the data. He will send Jochen Vandekerkhove the dataset with national EQRs and species lists wherever aliens occur.

11. Summary of conclusions of the meeting and future tasks

Action points:

-Every country will eventually need to supply information on the compliance criteria for national methods (template by Angelo Solimini will probably be updated in future).

-For Milestone 4, we will update Milestone 3. Jürgen will distribute the draft for Milestone 4 end of february for comments and additional information. For this, UK must write a response to question 3 and 8 (parameters included) and all countries must list their national types and state whether they are compliant with Annex II (provide a conversion table from national types to common types if possible).

-Kestas will update the Lithuanian data and send it to Jürgen ASAP.

-Jürgen will send the new database and the updated version of the harmonisation filter to everyone by the end of october.

-For Milestone 4, we will include information on common metrics and correlations with each national EQR.

-Jürgen will ask Jochen Vandekerkhove which (black)list(s) they use to assess impact of aliens next week.

-Kestas will check the national databases (from the ECOSTAT questionnaire report) in order to update our list. By december 2010 Kestas will distribute a draft list of all candidate alien species, each country has to indicate which ones are native to their country.

-Jürgen will check with Daniel Hering (WISER) about the availability of the data next week. He will send Jochen Vandekerkhove the dataset with national EQRs and species lists wherever aliens occur next week.

Next meeting:

Next ECOSTAT meetings are 30-31 March 2011 (Brussels) (Milestone 4) and 29-30 June 2011 (Ispra) (Milestone 5) and 24-25 October 2011 (Brussels).

We have a GIG meeting on 2-3 March 2011 in London (hosted by Rachel) to discuss the final decisions on metric selection and completing Milestone 4 and discuss the boundary setting procedure.

For the final decisions and completing Milestone 5, will have a meeting on 24-26 May 2011, probably in Berlin (hosted by Gwen) (to be confirmed).

8.3 Ergebnisprotokoll des zweiten XGIG-Treffens zu großen Flüssen in Koblenz (Originaltext ohne Anhang)

Minutes

XGIG Large River Intercalibration - Second Workshop in Koblenz, April 19th, 2010

Franz Schöll

Participants: Sebastian Birk (DE), Jürgen Böhmer (DE), Roel Knoben (NL), Wim Gabriels (BE-FL), Denisa Nemejcova (CZ), Franz Schöll (DE)

Low number of participants due to problems in air traffic (volcano-incidence)

1. National methods to assess the ecological status of very large rivers

12 Member States have reported on their assessment methods for the various BQE applied to very large rivers prior to the meeting. The group discussed aspects of the methods' WFD compliance and intercalibration feasibility. The criteria given by the new intercalibration guidance seem to be met in general (i.e. EQR, five class assessment etc.). However, Member States will be asked to provide more detailed information or amend/correct the data given (see Actions). A methods' overview is annexed to this document.

General remarks on bioassessment of very large rivers

The intercalibration exercise of very large rivers is focusing on existing (and approved) national methods. All these national methods acquire their biological data from the main river channel and are mainly based on concepts similar to the assessment of smaller rivers. We acknowledge that very large rivers feature more relevant habitat types than just the main channel (e.g. secondary channels, floodplain pools, dead arms), suggesting an ecologically more relevant assessment concept for very large rivers. We encourage to discuss this issue at ECOSTAT, however we don't consider this as a part of the current intercalibration exercise for very large rivers.

2. Actual intercalibration feasibility as determined by the group

The group decided to enter the actual intercalibration analyses for selected BQE and national methods, depending on the status of the methods and the availability of monitoring data. A short documentation of relevant intercalibration aspects per BQE is given in the following.

Benthic invertebrates

11 countries hold assessment methods. The majority of countries does kick-sampling close to the river banks, however the comparability of data gained from the whole sampling designs is questionable. The level of taxonomic identification is different and ranges from family- to species-level determination. Most countries apply multimetric assessment using

different sets of metrics. We suppose that the preferable method of intercalibration is Option 2 (use of common metrics). The pressure focus is general degradation (mixed pressures). The common intercalibration database currently contains approx. 370 samples. Most data were sampled at Central European rivers. The group considers the intercalibration feasible for Central European rivers.

Phytobenthos (Benthic diatoms)

11 countries hold assessment methods. All countries assess the diatom flora, only two countries additionally include other phytobenthos (DE, AT). Sampling techniques seem to be sufficiently comparable to try to work with IC Option 3 (direct comparison). All methods focus on similar pressures (mainly eutrophication), similar assessment metrics are used. The common intercalibration database contains approx. 170 samples. Most samples originate from Central European rivers. Intercalibration seems feasible. We will test IC Option 3 (direct comparison) and additionally work with common metrics.

Fish fauna

9 MS hold assessment methods. All countries apply electrofishing, some countries perform additional sampling by fyke nets or beam trawls. Multimetric assessment using different sets of metrics is generally used. Both IC Options (2+3) seem feasible which is in accordance with the experiences of the IC Fish Group. The pressure focus is general degradation (mixed pressures). The common intercalibration database contains approx. 80 samples with the majority of sites at Central European rivers. The group decided to further explore the intercalibration feasibility with the existing data (if additional resources are provided – see remarks below), and conclusions will be reported at the next XGIG Large Rivers meeting in September 2010. Exchange with IC river fish expert group is foreseen.

Phytoplankton

Four countries hold assessment methods. The sampling method is similar, data assessment is different. All methods focus on similar pressures (eutrophication), different assessment metrics are used. The common intercalibration database currently holds approx. 17 site-years (SK: 6, LT: 1, DE: 10). The group concludes that intercalibration is currently not feasible due to lack of data.

Macrophytes

Four countries hold assessment methods. Macrophytes are sampled by different survey techniques and different data assessment is applied. The common intercalibration database includes approx. 100 surveys. Problems arising from different sampling and assessment in combination with data scarcity are to be expected. The relevance of macrophytes for certain very large river types/states of degradation seems to be narrowed (lack of species, low

abundances, large water depth). Currently, intercalibration seems less feasible for this biocomponent. NL and FL consider a bilateral intercalibration exercise for macrophytes at their common water bodies (Meuse river).

3. Analytical options for very large river intercalibration

The intercalibration of methods applied to very large rivers is challenged by the lack of reference sites and the low availability of data from some countries (e.g. FL has only three water bodies belonging to very large rivers). Jürgen Böhmer and Sebastian Birk outlined possible approaches to overcome these issues in the data analyses. The exploration of pressure-impact relationships in the available data allows for including country data with an insufficient ecological gradient. These analyses support in selecting common intercalibration metrics and help in modelling reference metric values. Defining common benchmarks similar to the CB_{riv}GIG Macrophyte exercise can set benchmark values for common metrics, but requires common datasets assessed by all national methods. This approach allows for the detection of typological differences between countries/regions. It is planned to present the outcomes of these analytical options at the next XGIG Large River workshop in September 2010.

4. Outline of work plan / next steps

1 Completing info for WFD compliance checks based on Member States' comments to the methods' overview

2 Finalising common database (filling of gaps, data quality checks)

3 Analysis of invertebrates and diatom data (step-wise approach)
   a Selection of candidate common metrics using all available data
   b Establishing pressure-impact relationship between common metrics and abiotic parameters/gradients
   c Evaluation of typological differences using sites in Least Disturbed Conditions
   d Application of common benchmarking/reference modelling

4 Analysis of fish data

   The preliminary analysis for the intercalibration of fish assessment methods cannot be done by the XGIG Large River IC steering group due to lack of resources. Member States are asked to support the exercise providing adequate expertise and resources. The River Fish IC group indicated no capacities to deal with the intercalibration of very large rivers during the current intercalibration phase.
   Anticipated work steps: see point 3.

5. Next XGIG Large River IC workshop in Koblenz

22. to 23. September 2010

6. List of actions

1 Sebastian Birk: Prepare WFD compliance check of national methods (beginning of May 2010)

2 Member States' delegates: Description of reference and boundary setting (if not already provided specifically for very large rivers in the WISER-Questionnaires) (middle of May 2010)

3 Jürgen Böhmer: Completion and validation of database quality (beginning of June 2010)

4 Jürgen Böhmer and Sebastian Birk: Intercalibration analyses according to work plan (September 2010, next workshop)

5 Member States: provision of support regarding fish data and intercalibration (support starting in May; results by September 2010, next workshop)

8.4 Ergebnisprotokoll des dritten XGIG-Treffens zu großen Flüssen in Koblenz (Originaltext)

Final Minutes
XGIG Large River Intercalibration - Third Workshop in Koblenz, September 22nd- 23rd, 2010
Franz Schöll, Sebastian Birk
Participants: Ana Lara Romero (ES), Christine Keulen (BE-WL), Denisa Nemejcova (CZ), Emilia Misikova Elexova (SK), Franz Schöll (DE), Franz Wagner (AT), Gorazd Urbanic (SI), Jukka Aroviita (FI), Jürgen Böhmer (DE), Matus Haviar (SK), Nuno Caiola (ES), Rachel Benstead (UK), Roel Knoben (NL), Sebastian Birk (DE), Simone Ciadamidaro (IT), Stina Drakare (SE), Wim Gabriels (BE-FL), Wouter van de Bund (EC)

1. Update on IC comparability criteria
The criteria for judging comparability of national class boundaries in the intercalibration exercise were presented. Main criteria are
Method relatedness (i.e. coefficient resulting from Pearson correlation of national assessment and (pseudo-) common metric): $R \geq 0.5$

Boundary bias (i.e. deviation in the relative positioning of class boundaries, reflecting how stringent Member States are in defining the good ecological status): ± quarter of a class

Class agreement (i.e. confidence that two or more national methods on average report the same class for a given site): less than one class
Analytical options comprise either the regression of national assessment results against common metrics (IC Option 2) or pseudo-common metrics (IC Option 3a), or the direct comparison of assessment results per monitoring site (IC Option 3b). Member States are currently asked to comment on the draft to allow for final adoption of the criteria at the ECOSTAT meeting in October (i.e. Annex V of the Intercalibration Guidance).

2. Overview of national assessment methods for large rivers
We presented an overview of national assessment methods. Three Member States nominated new methods used in large river bioassessment: Italy (benthic invertebrates, diatoms, fish fauna), Austria (macrophytes), Slovenia (macrophytes). In total, 46 national methods are reported for the large river intercalibration exercise. We agreed to check their WFD-compliance based on the data collected for the overview document1. Outcomes of this check will be presented in the milestone 3 report. The compliance criteria are generally met, but for certain methods more information is needed.

3. Relationship of the XGIG Large River work to the other GIGs
The group concluded that all intercalibration work for very large rivers is completely carried out in the cross-GIG Large River intercalibration exercise. This means that GIGs can hand over the intercalibration work on very large rivers to the XGIG.

4. Database issues
12 Member States have delivered biological and environmental data for the common intercalibration database of large rivers. A data overview for the benthic invertebrates (BI) and diatoms (DI) was given. The data currently cover 42 (BI) / 26 (DI) rivers, 88 / 63 waterbodies, 137 / 77 stations, 367 / 378 samples and 945 / 649 taxa. Some implausible data entries need to be clarified. France did not deliver any data yet and will be asked for data submission to allow for full coverage of the geographical gradient in Europe.
The group stressed that the data will exclusively be used for the analyses required within this intercalibration exercise. Any other use (incl. publications) will require the specific approval of data owners.

5. First results of data analysis
Definition of benchmarks – diatom case-study
Based on 80 water bodies for which biological, physico-chemical and stressor data were available we performed a factor analysis to identify the main pressure gradients characterising the dataset. The first two components resulting from the analysis were highly related to either water quality variables or parameters of habitat quality (Figure 1). Most national water bodies showed a clumped distribution, i.e. the water bodies at large rivers of a region/country often show similar levels of disturbance instead of covering a broader gradient of degradation. Factor 1 representing water quality was significantly correlated with the potential common metrics for diatom intercalibration (IPS: r=-0.45, Trophic Index: r=0.37).

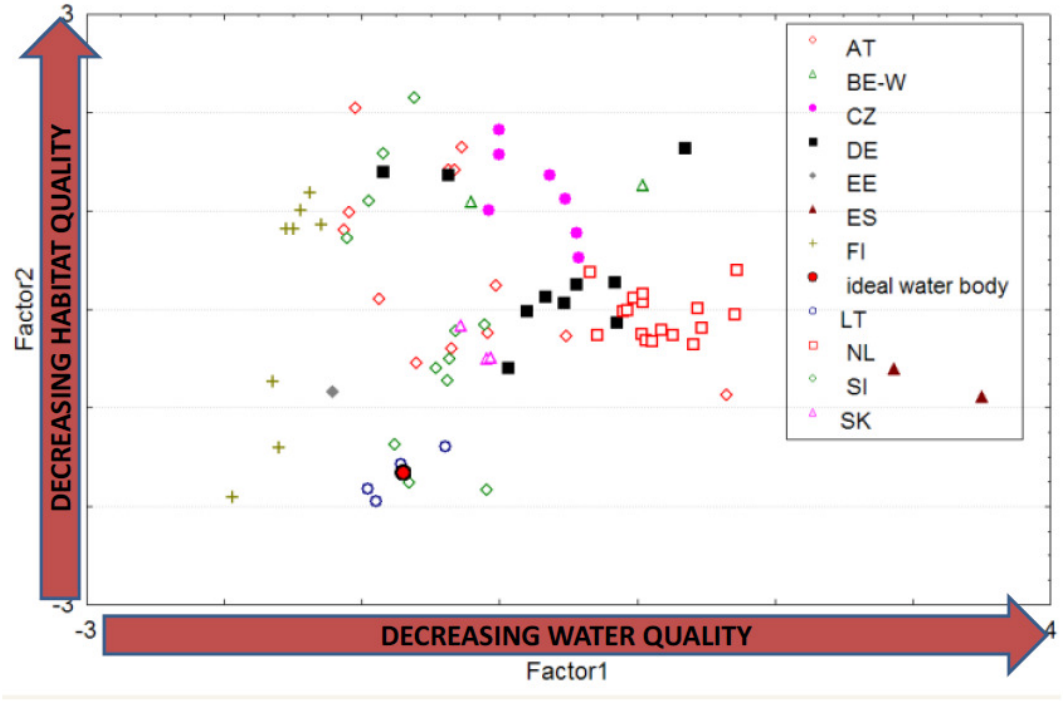

Figure 1: Position of national water bodies in „pressure space“ defined by factor analysis of environmental data (Factor 1 related to concentrations of Orthophosphate, Nitrate, Chloride; Factor 2 related to degree of channelization and impoundment)

Using the German standard for water quality, parameter thresholds were applied to the physico-chemical data to define water bodies in good water quality status. The 75th percentile value of Factor 1 scores at sites meeting this good status was chosen as the threshold to differentiate between benchmark and non-benchmark water bodies. Most abiotic parameters and the diatom metrics showed significant differences between these groups. When mapping their geographical position we recognised that benchmarks are predominantly located in north-eastern and eastern Europe, i.e. their geographical distribution is highly skewed. Furthermore, the benchmark water bodies already cover a relevant pressure gradient. These findings disclose that we need to develop an improved concept of alternative benchmarking for the large river intercalibration exercise.

Metric selection and extrapolation of reference conditions

Based on the full dataset various biological metrics were related to selected stressor parameters, i.e. stressor index (derived mainly from categorised morphology parameters), catchment land use index and %near natural areas, national degradation class (3 countries only), total phosphorus (TP) and minimum oxygen concentration. The invertebrate metrics showed best correlations with the stressor index and somewhat weaker relations with land use and TP. The national degradation class covered only parts of the gradient and had too few data. Best metrics were: *feeding type active filterer*, *current preference rheophilic* as well as *indifferent*, the “*rheoindex*”, *habitat preferences akal* as well as *psammal*, *feeding type gatherer*, *RTI*, *PTI*, *SI*, *zonation preference metapotamal* and *rhithral*.

The diatom metrics revealed best correlations with TP that were much stronger than all macroinvertebrate correlations (see Figure 2); the correlations were weaker with land use and the stressor index. The best related metric was the *IPS*. The correlations of individual metrics with the national EQRs provided with the biological data were generally weaker than correlations between metrics and stressors. This was mainly caused by the differences among national assessment methods

emphasising different stressors. Improved concepts for alternative benchmarking were discussed. The common data basis and strong dose-response relationships for the diatoms allow for an *extrapolation of reference conditions* (Figure 2). This technique will be further investigated for diatoms and benthic invertebrates in the next months.

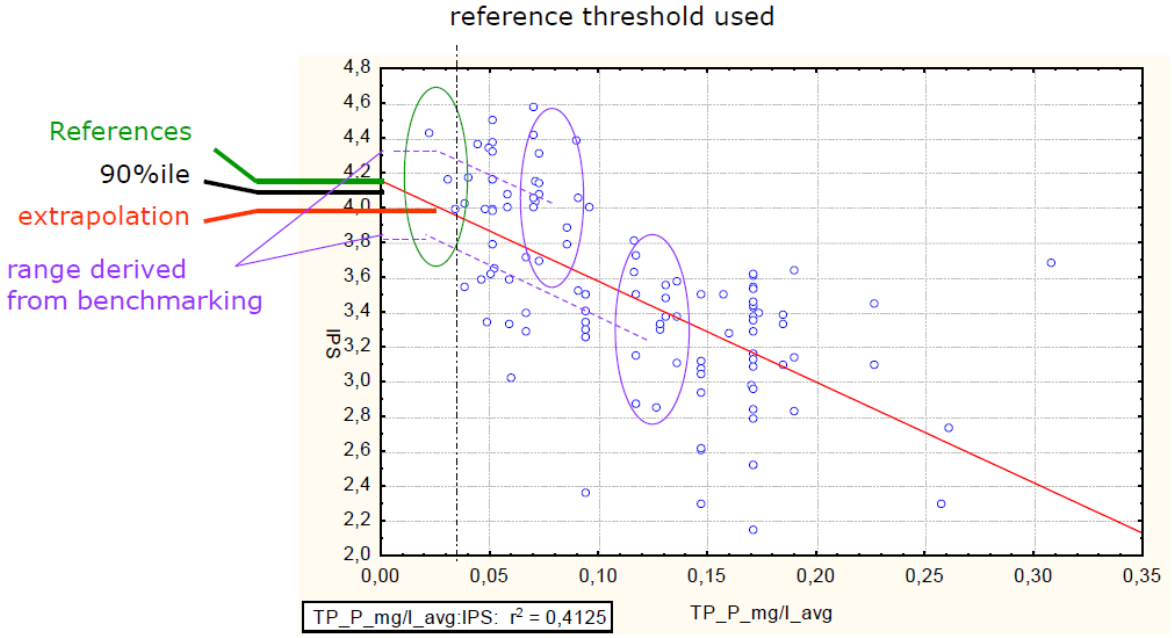

Figure 2: Comparison of different approaches to derive reference conditions using the dose-response relationship between TP and the diatom metric IPS (R2=0.41)

6. Checking the steps of the IC guideline

The *feasibility checks* required by the IC guidance comprise intercalibration typology, pressures addressed by the national classifications and assessment concepts. All aspects were checked, and we concluded that intercalibration is feasible at least for the diatom and invertebrate methods. More detailed replies to the questions on feasibility are given in the IC milestone report 3.

The compilation of the *common database* is at an advance state (see above). We will ask for more data from France, Hungary and Romania. Individual Member States that already provided data will be addressed to clarify database issues, if necessary.

We agreed to test *intercalibration option* 3 (direct comparison) in the diatom exercise, since national techniques of data acquisition for diatoms are sufficiently comparable. Thus, we will ask the Member States to deliver information about the national diatom typology of large rivers and specifications of the national diatom indices (indicator lists, metric algorithm and combination etc.). The calculation of the national diatom assessments will be done centrally using the common dataset. For invertebrates an *intercalibration option* 2 is envisaged. However, the national datasets used in intercalibration mostly cover only a narrow quality gradient and comprise few water bodies / monitoring sites. Therefore, we aim at merging those national datasets that were acquired by similar techniques (e.g. comparable sampling effort and level of identification). This should extent the data basis for the subsequent regression analyses. We finally plan to compare the national class boundaries against a common metric using these multi-national datasets of similar data characteristics.

The diatom exercise can operate on the basis of *pseudo-common metrics* (i.e. average of national EQR excluding the country that is compared). The invertebrate exercise will refer to

true (biological) *common metrics* that will be selected on the basis of the outcomes of further analyses (using the updated common database). The use of large river-subtypes reflecting the biogeographical differences among European regions is also envisaged in the scope of further data analysis.

7. Other topics

Franz Wagner addressed the relevance of the XGIG Large River intercalibration work for the ongoing development of bioassessment tools for very large rivers in Europe. In particular, a possible contribution to the planning phase of the third Joint Danube Survey was mentioned. The group concluded to participate in the discussion by providing a conceptual document including an analysis of the state-of-the-art, shortcomings and perspectives of large river bioassessment, and recommendations for future work.

8. List of actions

1 Franz Schöll will address France, Hungary and Romania for data delivery (end of September 2010)

2 Jürgen Böhmer will clarify remaining database issues (e.g. missing data, implausibilities) with the respective Member States (end of October 2010)

3 Jürgen Böhmer will collect specifications on the national diatom assessments to prepare IC Option 3 (end of October 2010)

4 Simone Ciadamidaro will update information about the Italian assessment methods (incl. delivery of the WISER questionnaire) (end of October 2010)

5 Sebastian Birk and Jürgen Böhmer will work on the intercalibration analyses during winter 2010/11 to report on the analytical outcomes by February 1st, 2011 (before the next meeting)

6 Sebastian Birk will draft a conceptual document on large river bioassessment to be circulated to the group (before the next meeting)

9. Next XGIG Large River IC workshop in Koblenz

February 10th and 11th, 2011

8.5 Ergebnisprotokoll des Seen-Makroinvertebraten-AL-GIG-Treffens in Aix en Provence (Originaltext)

Alpine Lake Invertebrate Meeting

Aix-en-Provence 06-07- Dec 2010

Participants:
Angelo Solimini (IT, Wiser)
Christine Argillier (Fr)
Cedrix Provost (Fr)
Muriel Gevrei (Fr)
Juergen Bohemer (DE)
Georg Wolfram (AT)
Gorazd Urbanic (SI)

Introduction and general statements

Developing pressure specific relationships should be preferred over general degradation type relationships.

France will not develop a national method by the deadline of this IC round. However, France will consider to adopt the common metric developed in the IC process as national method if proved to be applicable to national types. Italy has not provided national boundaries for any classification method to date. Suggestion of this group is to consider the adoption of the common metric.

IC procedure in this GIG will be split among 2 exercises. The first will target established classification methods in the eulittoral zone (DE and SI). The purpose of this exercise will be to intercalibrate the 2 existing national metric and to provide to other member states a standard (e.g. the common metric) that can be used in the future to validate newly developed national methods. The second IC exercise, will establish a common metric and class boundaries in the sublittoral zone (no national methods available, with the exception of DE that will, however, not used in national monitoring). The purpose of this exercise will be to provide a standard (the IC metric) to be used by member states to compare national methods whenever available.

The pressure target in both IC exercises will be hydromorphological alterations. This group is aware that benthic invertebrates respond to secondary effects of euthrophication but believe that this pressure can be tracked more efficiently and in a more cost effective way with other BQEs (e.g. phytoplankton).

Common database

The GIG established a common database. In addition to abundances of invertebrates per site, the common database include information on morphologicl prameters and stressors at water body (wjhole lake) and site levels.

Description of parameters of database

Water body level

MS

National type + IC lake type

Coordinates

Catchment, Altitude

Mean depth, Max depth

Surface area, Volume

Alkalinity, Conductivity

Ice cover

Stressors – whole lake

Obligatory

Land use 100-300 m; preferred: 200 m, 100 – 300 m is still ok

- Forest
- Intensive agriculture (corine codes 2.1, 2.2, 2.4.1, 2.4.2)
- Grassland = non-intensive agriculture (corine codes 2.3.1, 2.4.3, 2.4.4)
- Urban

Land use catchment

TP, TN, chl-a

Shoreline alteration %

Stressors – site level

Lake name

Sampling site

Naturalness national SI+GE

LHS sum of pressures (in table samples)

Land use

% forest

% grassland and agriculture

% urban (roads, houses, railway, camping, recreational, harbour …)

% near natural excl. forest (reed, shrubs, moor, rocks, …)

Shoreline alteration soft engineered p/a (e.g. beach, vegetation cut)

Shoreline alteration hard engineered p/a

Shoreline_classes

Taxa list

5 versions (all meiofauna and acari to be removed)

Raw (as provided)

All genus

All family

All raw, except chiro to subfamiliy (chironominae: tribe), oligochaetes to family

All genus, except chiro to subfamiliy (chironominae: tribe), oligochaetes to family

Not agreed !!

Action list

In 2011: 3 ecostat meetings (March, June, Oct)

Milestone 4 in Feb 2011: IC on eulittoral

Milestone 5 in May 2011 = final report

Next meeting 23-24 March 2011

Ljubljana (confirmed by Gorazd within next days)

- everybody sends missing data to Jürgen until mid Jan 2011

- Jürgen harmonizes tables and distributes again the final version (including the quieries)

- Jürgens sends final GE method

- check taxonomic levels (Georg), until March meeting

- option 3 with final SI and [soon] final GE method on eulittoral (Gorazd), until March meeting

- metrics – correlation analysis (Jürgen)

- metrics by modelling approach/multivariate (Christine)

- ref cond (1. Lake level, 2. Site level)

8.6 Dritter Bericht der CB-GIG-Invertebratengruppe an ECOSTAT

EUROPEAN COMMISSION

DIRECTORATE GENERAL JRC

JOINT RESEARCH CENTRE

Institute of Environment and Sustainability

WFD Intercalibration Phase 2: Milestone 3 report

Water category/GIG/BQE/ horizontal activity:	**Lake / Central Baltic / Benthic Fauna**
Information provided by:	Juergen Boehmer

1. Organisation

1.1. Responsibilities

Indicate how the work is organised, indicating the lead country/person and **the list of involved experts of every country:**

Juergen Boehmer (DE; lead)

Kestas Arbaciauskas (LT)

Gwendolin Porst (WISER)

Bart Reeze (NL)

Andris Ceirans (LV),

Lionel Mazzella (FR)

Henn Timm (EE)

Wim Gabriels (BE/FL)

Malgorzata Golub (PL)

Peter Wiberg-Larsen (DK)

UK will determine a new expert soon

DE is responsible for the database. All countries are going to work on parts of the analysis and the final reports.

1.2. Participation

Indicate which countries are participating in your group. Are there any difficulties with the participation of specific Member States? If yes, please specify:

BE/FL, DE, DK, EE, FR, LT, LV, NL, PL, UK

Funding for Denmark and Poland is not sufficient for this year, limiting their participation; UK is momentarily missing an expert

1.3. Meetings

List the meetings of the group:

PL (June 2008), DE (October 2008), NL (April 2009), LT (January 2010), EE (June 2010), Belgium (planned Oktober 2010)

2. Overview of Methods to be intercalibrated

Identify for **each** MS the national classification method that will be intercalibrated and the status of the method

1. finalized formally agreed national method,
2. intercalibratable finalized method,
3. method under development,
4. no method developed

Member State	Method	Status
BE/FL	Multimetric Macroinvertebrate Index Flanders (MMIF)	1 - .finalized agreed national method
NL	WFD-Metrics for Natural Watertypes	1 - .finalized agreed national method
DE	German Macroinvertebrate Lake Assessment	2 - intercalibratable finalized method
DK		3 – under development
EE	Estimation of Freshwater Quality Using Macroinvertebrates	1 - .finalized agreed national method
PL		3 – under development
LV		3 – under development
LT		3 – under development
UK	Chironomid Pupal Exuvial Technique (CPET)	1 - .finalized agreed national method

Make sure that the **national method descriptions** meet the level of detail required to fill in the table 1 at the end of this document !

3. Checking of compliance of national assessment methods with the WFD requirements (April 2010 + update in October 2010)

Do all national assessment methods meet the requirements of the Water Framework Directive? (Question 1 in the IC guidance)
Do the good ecological status boundaries of the national methods comply with the WFD normative definitions? (Question 7 in the IC guidance)

3 – not started; Compliance criteria were defined, but the methods have only been roughly checked (results see below; detailed check will be on the Upcoming meeting in October;

List the WFD compliance criteria and describe the WFD compliance checking process and results (the table below lists the criteria from the IC guidance, please add more criteria if needed)

Compliance criteria	Compliance checking conclusions
1. Ecological status is classified by one of **five classes** (high, good, moderate, poor and bad).	Yes for all methods
2. High, good and moderate ecological status are set in line with the WFD's **normative definitions** (**Boundary setting procedure**)	Yes for all methods
3. **All relevant parameters** indicative of the biological quality element are covered (see Table 1 in the IC Guidance). A **combination rule** to combine para-meter assessment into BQE assessment has to be defined. If parameters are missing, Member States need to demonstrate that the method is sufficiently indicative of the status of the QE as a whole.	To be discussed for UK and FR; yes for the others
4. Assessment is adapted to **intercalibration common types** that are defined in line with the typological requirements of the WFD Annex II and approved by WG ECOSTAT	To be discussed
5. The water body is assessed against **type-specific near-natural reference conditions**	Yes for all
6. Assessment results are expressed as **EQRs**	Not for EE; yes for others
7. Sampling procedure allows for **represent-tative** information about water body quality/ ecological status **in space and time**	Yes for all
8. All data relevant for assessing the biological **parameters** specified in the WFD's normative definitions are covered by the **sampling procedure**	Yes dor all
9. Selected taxonomic level achieves adequate **confidence and precision** in classification	Yes for all

Clarify if there are still gaps in the national method descriptions information.

Summarise the conclusions of the compliance checking:

In conclusion, all methods should seem to be compliant, provided that the detailed checking will not show otherwise

4. Methods' intercalibration feasibility check

Do all national methods address the same common type(s) and pressure(s), and follow a similar assessment concept? (Question 2 in the IC guidance)

4.1. Typology

Describe common intercalibration water body types and list the MS sharing each type

Common IC type	Type characteristics	MS sharing IC common type
L-CB1	Lowland shallow stratified calcareous	BE – yes DE – yes DK – yes EE – yes UK – yes LT – yes LV – yes NL – yes PL – yes
L-CB2	Lowland very shallow stratified calcareous	BE – yes DE – yes DK – yes EE – yes UK – yes LT – yes LV – yes NL – yes PL – no
L-CB3	Lowland shallow stratified siliceous	BE – no DE – no DK – no EE – no UK – no LT – no LV – yes NL – no PL – no

What is the outcome of the feasibility evaluation in terms of typology? Are all assessment methods appropriate for the intercalibration water body types, or subtypes?

Method	Appropriate for IC types / subtypes	Remarks
BE, DE, EE, UK, NL	IC type 1 IC type 2	
Conclusion Is the Intercalibration feasible in terms of **typology ? Yes**		

4.2. Pressures

Describe the pressures addressed by the MS assessment methods

Method	Pressure	Remarks
BE, DE, EE, NL	Multiple stressors (eutrophication + hydromorphology)	
UK	eutrophication	

Conclusion

Is the Intercalibration feasible in terms of **pressures** addressed by the methods?

Yes, since both eutrophication and hydromorphology are analysed in the IC-exercise (together and separately)

4.3. Assessment concept

Do all national methods follow a similar assessment concept?

Examples of assessment concept:

- **Different community characteristics** - structural, functional or physiological - can be used in assessment methods which can render their comparison problematic. For example, sensitive taxa proportion indices vs species composition indices.
- Assessment systems may focus on **different lake zones** - profundal, littoral or sublittoral - and subsequently may not be comparable.
- Additional important issues may be the **assessed habitat type** (soft-bottom sediments versus rocky sediments for benthic fauna assessment methods) or **life forms** (emergent macrophytes versus submersed macrophytes for lake aquatic flora assessment methods)

Method	Assessment concept	Remarks
BE, DE, EE, NL	Eulittoral macroinvertebrates, sampled by handnet	
UK	Chironomid exuviae representing all lake zones	Parallel eulittoral samples were collected for a number of lakes

Conclusion

Is the Intercalibration feasible in terms of **assessment concepts?**

Yes for eulittoral methods;
the UK method is not comparable due to differences in sampling design, but a linkage might be possible via parallel eulittoral samples

5. Collection of IC dataset

Describe data collection within the GIG.

This description aims to safeguard that compiled data are generally similar, so that the IC options can reasonably be applied to the data of the Member States.

Make the following table for each IC common type

Member State	Number of lakes; () = incomplete		
	Biological data	Physico- chemical data	Pressure data
BE	10 lakes / 37 sites	10	0
DE	54 lakes / 410 sites	54	(54)
DK	17 lakes / 79 sites	17	(17)
EE	20 lakes / 20 sites	20	20
UK	26 lakes 26 sites	26	(26)
LT	8 lakes 8 sites	8	(8)
LV	23 lakes 23 sites	23	23
NL	32 lakes 113 sites	32	32
PL	6 lakes / 36 sites	6	6

List the data acceptance criteria used for the data quality control and describe the data acceptance checking process and results

Since all taxonomic data could be assigned to the relevant taxonomic codes, and differences in taxonomic precision could be largely minimised by applying a taxonomic harmonisation list, all data were accepted for the analysis. All data fulfilled the requirements, but many the data are often incomplete. Therefore, not all data could be included in each analysis.

6. Benchmarking: Reference conditions or alternative benchmarking

In section 2 of the method description of the national methods above, an overview has to be included on the derivation of reference conditions for the national methods. In section 6 the checking procedure and derivation of reference conditions or the alternative benchmark at the scale of the common IC type has to be explained to ensure the comparability within the GIG.

Clarify if you have defined
- common reference conditions (Y/N)
- or a common alternative benchmark for intercalibration (Y/N)
-

6.1. Reference conditions

Does the intercalibration dataset contain sites in near-natural conditions in a sufficient number to make a statistically reliable estimate? (Question 6 in the IC guidance)

- Summarize the common approach for setting reference conditions (true reference sites or indicative partial reference sites, see Annex III of the IC guidance):

  Due to the scarcity of reference sites, different approaches for deriving the reference conditions are being compared: The 90%ile of metrics values, modelling by extrapolation and multibenchmarking. The final reference still to be set.

- Give a detailed description of **reference criteria** for screening of sites in near-natural conditions (abiotic characterisation, pressure indicators):

	Criteria [1]	**Notes** [2]	**reference threshold**	**rejection threshold**
Catchment characteristics	(1) Reference threshold > 85 % nature (i.e. "natural" forests, wetlands, moors, meadows, pasture); NOTE: Rejection threshold = 70 %	Land use is determined using CORINE categories, if more accurate national maps are not available. "Not natural" (opposite to "nature") are agricultural land and urban areas. Forest that are planted and fertilized (e.g. spruce cultures used as christmas trees etc.) are "not natural". They should be regarded as agricultural land. Pasture are extensively grazed grassland.	>=90	>=70
	(2) No intensive crops (incl. vines) within in the near surroundings (i.e. within a zone of 200 m from the lake shore)	provide numerical value		
	(3) ≤ 5 % urbanisation and peri-urban areas in the near surroundings (i.e. within a zone of 200 m from the lake shore)		<=5 (not fixed yet)	<=5 (not fixed yet)
	(4) No direct inflow of treated or untreated waste water			
	(5) Impact of wastewater from scattered dwellings low (i.e. < 10 inhabitants km^{-2}) within the whole catchment	Inferred from national maps; number of houses multiplied by the national average of inhabitats per household; provide numerical value	<10 (not fixed yet)	<10 (not fixed yet)
Morphology	(6) ≤ 5 % artificial modification of the shore line	provide numerical value	<=5 (not fixed yet)	<=5 (not fixed yet)
Trophic state	(7) Generally: No (or insignificant) deviation of the actual from the natural trophic state			
Other pressures	(8) No mass (or significant) recreation activities (camping, swimming, roing, coarse fish angling, put and take angling, releasing and feeding of ducks for hunting)			
	(9) No actively invading (and reproducing) plant or animal species that may negatively impact the structure, productivity, function and diversity of the ecosystem			
	(10) no evidence for one of the following pressures: - Significant changes in the hydrological and sediment regime of the tributaries (larger than the range between the natural mean low water level and the natural high water level) - Fish farm activities or other fishing operations that negatively impact the structure, productivity, function and diversity of the ecosystem - Introduction of non-native fish species, unless their abundance and biomass is insignificant - Sigificant changes in status parameters prior to major changes in industrialisation, urbanisation and intensification of the agriculture - Substances mentioned in Annex X and/or in annex VIII of the WFD in concentrations above the limits of detection of the most advanced analytical techniques in general use or presence of possible and important sources of pollutants. - Measured values of other anthropogenic, synthetic substances above quality objectives and not near natural background concentrations, except for those from atmospheric sources			

(1) The criteria are provided based on: /1/ CIRCA, Feb. 2008, "WFD Intercallibration technical report, Part 2 - lakes, section 3 - phytoplankton composition"; /2/ CIRCA, Feb. 2008, "WFD Intercallibration technical report, Part 2 - lakes, section 3 - macrophytes"; /3/ "CB GIG Rivers reference criteria"
(2) Some of the criteria are difficult to assess - due to the lack of data, and/or because there are qualitatively rather than quantitatively defined

- Identify the **reference sites** for each Member State in each common IC type. Is their number sufficient to make a statistically reliable estimate?

No

- Explain how you have screened the biological data for impacts caused by pressures not regarded in the reference criteria to make sure that true reference sites are selected:

Biological data were screened for alien species

- Give detailed description of **setting reference condition**s (summary statistics used)

Reference setting is stil in progress.

6.2. Alternative benchmarking (only if common dataset does not contain reference sites in a sufficient number)

- Summarize the common approach for setting **alternative benchmark** conditions (describe argumentation of expert judgment, inclusion of modelling)

As stated above, different approaches of benchmarking/modelling are being compared. All approaches a based on pressure-metric relationships (does response curves). Since no single alternative benchmark can be found, which sufficiently covers all types for all countries, the whole dose response relationship serves as kind of “multiple benchmark”. The adjustment is done by selecting the reference value which adjusts all types/countries to the dose response regression for all countries together. This procedure is also suitable (and probably the only way) to benchmark types/countries with only few values.

- Give a detailed description of **criteria** for screening of **alternative benchmark** sites (abiotic criteria/pressure indicators that represent a similar low level of impairment to screen for least disturbed conditions)

Not applicable

- Identify the **alternative benchmark sites** for each Member State in each common IC type

Not applicable

- Describe how you validated the selection of the alternative benchmark with biological data

Not applicable

- Give detailed description how you identified the position of the alternative benchmark on the gradient of impact and how the deviation of the **alternative benchmark** from reference conditions has been derived

Not applicable

Describe the **biological communities** at reference sites or at the alternative benchmark, considering potential biogeographical differences:

Not applicable for benchmarks, but a description of the characteristics of the reference conditions will be given after their final derivation.

7. Design and application of the IC procedure

7.1. Please describe the choice of the appropriate intercalibration option.

Which IC option did you use?

- IC Option 1 - Same assessment method, same data acquisition, same numerical evaluation (Y/N) No
- IC Option 2 - Different data acquisition and numerical evaluation (Y/N) Yes
- IC Options 3 - Similar data acquisition, but different numerical evaluation (BQE sampling and data processing generally similar, so that all national assessment methods can reasonably be applied to the data of other countries) → supported by the use of common metric(s) (Y/N)
- Other (specify) (Y/N) No

Explanation for the choice of the IC option:

The sampling and evaluation procedures of the methods are too different for option 1 and 3.

In case of IC Option 2, please explain the differences in data acquisition

The most important differences include differences in determination level of important taxonomic groups, differences in sampling season and differences of habitats covered.

7.2. IC common metrics (When IC Options 2 or 3 are used)

Describe the IC Common metric:

Not finally determined

Are all methods reasonably related to the common metric(s)? (Question 5 in the IC guidance)

There might be weak correlations for some countries; work is still in progress;

Please provide the correlation coefficient (r) and the probability (p) for the correlation of each method with the common metric (see Annex V of IC guidance).

Member State/Method	r	p
A		
B		

Explain if any method had to be excluded due to its low correlation with the common metric:

Preliminary results: Depending on the final selection of common metrics, there might be an exclusion of a method. Which one this will be also depends on the final metric selection. In that case however we will try to overcome this with a second multimetric index, which includes the excluded method and excludes another country.

8. Boundary setting / comparison and harmonization in common IC type

Clarify if

- boundaries were set only at national level (Y/N) Yes
- or if a common boundary setting procedure was worked out at the scale of the common IC type (Y/N) No; yes only if will turn out to be necessary

In section 2 of the method description of the national methods above, an overview has to be included on the boundary setting procedure for the national methods to check compliance with the WFD. In section 8.1 the results of a common boundary setting procedure at the scale of the common IC type should be explained where applicable.

8.1. Description of boundary setting procedure set for the common IC type

Summarize how boundaries were set following the framework of the BSP:

- Provide a description how you applied the full procedure (use of discontinuities, paired metrics, equidistant division of continuum)

- Provide pressure-response relationships (describe how the biological quality element changes as the impact of the pressure or pressures on supporting elements increases)

- Provide a comparison with WFD Annex V, normative definitions for each QE/ metrics and type

8.2. Description of IC type-specific biological communities representing the "borderline" conditions between good and moderate ecological status, considering possible biogeographical differences (as much as possible based on the common dataset and common metrics).

Harmonised boundaries are not finally set yet

8.3. Boundary comparison and harmonisation

Describe comparison of national boundaries, using comparability criteria (see Annex V of IC guidance).

Harmonised boundaries are not finally set yet

- Do all national methods comply with these criteria ? (Y/N)
- If not, describe the adjustment process: