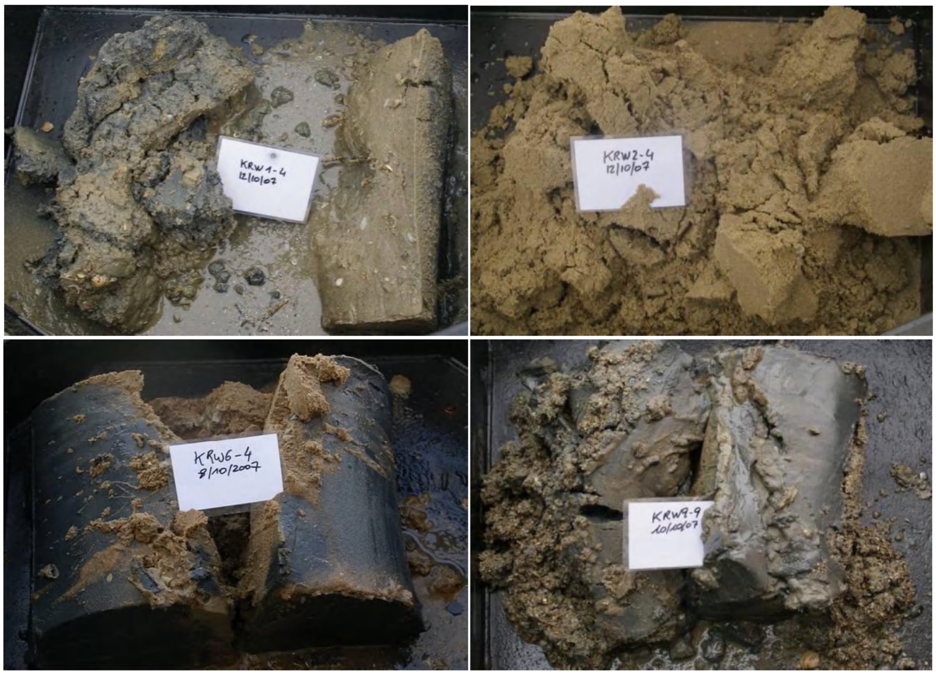
Macrobenthos monitoring at the Belgian coast and the evaluation of the availability of reference data for the Water Framework Directive

- REPORT -



Van Hoey, G., Wittoeck, J., Hillewaert, H., Van Ginderdeuren, K., Hostens, K.

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Contents

SUMMARY

The Water Framework Directive (2000/60/EG) of the European Parliament and of the Council aims to achieve a good ecological and chemical quality status for all water types by 2015. The quality status of a water body can be determined based on the evaluation of biological, chemical and hydro-morphological quality elements. The evaluation of those quality elements is based on the integration of well defined biological quality criteria. Each of these quality criteria support a classification (bad, poor, moderate, good and high) aiming at measuring the 'health' of the system compared to reference conditions. Furthermore, the WFD (Article 8) requires to have monitoring programmes for the quality elements in their waters.

This project concerns the quality element macro-invertebrates in the Belgian coastal zone (<1 nautical mile). The evaluation tool for macro-invertebrates is the Benthic Ecosystem Quality Index (BEQI), which aims at providing a signal that is capable of showing significant deviations from a defined reference state. An important aspect within the BEQI is the use of the habitat approach, which presumed that there is a habitat typology within the water body. The habitat typology for the Belgian coast concerns the following main types: (1) Abra alba habitat (muddy fine sand), (2) Nephtys cirrosa habitat (well sorted medium sand), (3) Macoma balthica habitat (mud).

A first attempt to assess the ecological quality status of macro-invertebrates in the Belgian coastal waters is done within the REFCOAST project and Van Hoey et al. (2007b). This showed some shortcomings, such as (1) the low amount of reference samples and (2) almost no spatial coverage of the assessment samples within the 1 mile zone of the Belgian coast. Consequently, the ecological status of macro-invertebrates and the reference conditions have to be re-determined. This is done within the current project by monitoring the quality element macro-invertebrates for the Belgian Coastal waters (<1 nautical mile) and secondly to re-determine the reference condition for the macro-invertebrates of the Belgian Coast.

Nine sampling locations within the 1 mile zone of the coast were selected, based on the position of possible influences (rivers, harbours), nature conservation areas, knowledge on sedimentology and benthic communities. At those sampling locations, 15 samples were at random taken within an area of 0.6 km². This gives a total of 135 samples. An analysis of the benthos characteristics at those locations showed sometimes a big variation of those characteristics within 1 location. An overall trend is an impoverishment in diversity, density and biomass towards the eastern part of the coast. It was possible to link the samples to one of the three habitat types, based on a detailed community analysis. Due to this, the following conclusions about the sampling strategy could be made: (1) the selection of the 9 sampling locations leads to a good spatial distribution of the samples, except in the central zone; (2) an increase of the number of samples within the Abra alba habitat in the western and central coastal zone is necessary; (3) a strong reduction in the number of samples in the Macoma balthica habitat in the eastern coastal zone and to maintain or slightly reduce the number of samples in the other coastal zones; (4) the Nephtys cirrosa habitat is mainly found in the western coastal zone with enough samples, but the occurrence in the central zone has to be better investigated.

A large amount of data (Belgian (UGent, ILVO), France, The Netherlands) was available for extending the reference data for the different habitats in the Belgian Coastal zone. Finally, it seems that the data taken in the period 1994 - 2004 shows the best temporal and spatial variability in benthos sampling points within the Belgian Coastal zone (< 6 nautical mile) and was selected as reference data. This data could be linked to the 3 main habitat types, based on a detailed community analysis. Due to this, enough samples were available for each habitat type to determine the reference boundary values, which were included in the report.

SAMENVATTING

De Europese kaderrichtlijn water (2000/60/EG) (KRW) heeft als doel om een goede ecologische en chemische status van al hun wateren te bekomen tegen 2015. Deze kwaliteitsstatus wordt bepaald aan de hand van een evaluatie van biologische, chemische en hydromorfologische kwaliteitselementen. De evaluatie van deze elementen is gebaseerd op de integratie van duidelijk gedefinieerde biologische kwaliteitscriteria. Aan deze criteria is een classificatie verbonden (zeer slecht, slecht, matig, goed, heel goed) om de 'gezondheid' van het systeem te meten ten opzichte van referentie condities. Daarnaast, vraagt de KRW (artikel 8) om voor elke kwaliteitselement monitoring programma's vast te leggen.

Dit project gaat over het kwaliteitselement macro-invertebraten in de Belgische kustzone (< 1 nautische mijl). Macro-invertebraten worden geëvalueerd met de Benthische ecosysteem kwaliteitsindex (BEQI), welke tracht om significante veranderingen ten opzichte van de referentie situatie weer te geven. Een belangrijk aspect binnen de BEQI is het gebruik van de habitat benadering, welke een habitat typologie voor elk waterlichaam vereist. De habitat typologie voor de Belgische kust kan terug gebracht worden tot de volgende voornaamste typen: (1) Abra alba habitat (slibberig fijn zand), (2) Nephtys cirrosa habitat (goed gesorteerd medium zand), (3) Macoma balthica habitat (slib).

Een eerste aanzet in verband met het bepalen van de ecologische kwaliteitsstatus van macro-invertebraten in de Belgische kustzone is gedaan binnen het REFCOAST project en Van Hoey et al. (2007b). Dit vertoonde een aantal tekortkomingen, zoals (1) een te laag aantal referentie stalen en (2) geen ruimtelijke dekking van de assessment stalen binnen de 1 mijlszone van de Belgische kust. Hierdoor moet de ecologische status van het benthos en de referentie condities opnieuw bepaald worden. Dit gebeurt binnen dit project door een 1^ste^ monitoring van het benthos in de Belgische kust wateren uit te voeren (najaar 2007) en een herdefiniëring van de referentie condities voor het benthos aan de Belgische kust te maken.

Negen staalname locaties binnen de 1 mijlzone van de kust werden afgebakend, gebaseerd op de positie van invloedsbronnen (rivieren, havens), natuurgebieden, kennis van sedimentologie en benthische gemeenschappen. Op deze staalname locaties werden telkens 15 stalen genomen at random binnen een gebied van 0.6 km², wat neerkomt op een totaal van 135 stalen. Een analyse van het benthos op deze locaties toont aan dat er soms grote variatie in de benthos karakteristieken bestaat binnen één locatie. Maar algemeen gezien treedt er een verarming op in de diversiteit, densiteit en biomassa naar het oosten toe. Een gedetailleerde gemeenschapsanalyse liet toe om de verschillende stalen te linken aan één van de drie habitat typen. Hierdoor konden volgende conclusies gemaakt worden betreffende

de gevolgde staalnamestrategie: (1) Een behoud van de 9 locaties zorgt voor een goede ruimtelijke spreiding; (2) een verhoging van het aantal stalen in het Abra alba habitat in de Westelijke en midden kustzone is nodig; (3) een sterke reductie in het aantal stalen in het Macoma balthica habitat in de Oostelijke kustzone en een behoud of lichte reductie in de andere kustzones; (4) het Nephtys cirrosa habitat is voornamelijk gevonden in de Westelijke kustzone met een voldoende grote bemonstering, maar het voorkomen in de midden kustzone moet beter onderzocht worden.

Voor het uitbreiden van de referentie data voor de verschillende habitats in de Belgische kustzone, was er een ruime beschikking over data (Belgische (UGent, ILVO), Franse en Nederlandse). De data genomen tussen 1994 en 2004 vertoonden de beste temporele en ruimtelijke spreiding in benthos stalen binnen de Belgische kustzone (< 6 mijl) en deze werden geselecteerd als referentie data. Mede door een gedetailleerde gemeenschapsanalyse kon deze data gelinkt worden aan de 3 voornaamste habitat typen. Hierdoor waren er voor elk habitat type voldoende stalen beschikbaar voor het bepalen van de referentie grenswaarden, welke zijn opgenomen in het rapport.

RESUME

La Directive Cadre Européenne de l'Eau (2000/60/E6) (D.C. eau) a comme objectif d'obtenir un bon statut écologique et chimique des eaux avant 2015. Ce statut de qualité est déterminé au moyen d'une évaluation des éléments de qualité biologiques, chimiques, et hydro-morphologiques. L'évaluation de ces éléments est basée sur l'intégration de critères de qualité biologiques. A ces critères une classification (très mauvais, mauvais, moyen, bon, très bon) est liée a fin de mesurer ''la santé'' du système par rapport aux conditions référentielles. En plus la Directive Cadre de l'Eau (article 8) demande d'établir des programmes de monitoring pour chaque élément de qualité.

Dans ce projet on traite l'élément de qualité des macro-invertébrés dans la zone côtière belge (<1 mille nautique). Les macro-invertébrés sont évalués par le BEQI (index de qualité de l'écosystème benthique), qui tâche de démontrer des changements significatifs par rapport à la situation référentielle. Dans ce contexte un aspect important est l'usage de l'approche habitat, qui exige une typologie habitat pour chaque organisme. La typologie habitat peut être réduite aux types importants suivants: (1) habitat Abra alba (sable fin vaseux), (2) habitat Nephtys cirrosa (sable moyen et bien trié), (3) habitat Macoma balthica (limon).

Un premier pas dans la détermination du statut de qualité écologique de macro-invertébrés dans la zone côtière belge a été fait au sein du projet REFCOAST et Van Hoey et al. (2007). Celui-ci faisait preuve de quelques défaillances telles que (1) un nombre insuffisant d'échantillons de référence et (2) pas de couvrement spatial des échantillons à l'intérieur de la zone d'un mille de la côte belge. Ainsi il faudra redéfinir l'état écologique du benthos et les conditions de référence, ce qui se fait dans ce projet par un premier monitoring du benthos (fin 2007) et par une redéfinition des conditions de référence pour le benthos à la côte belge.

On a délimité neuf locations de prise d'échantillons dans la zone d'un mille de la côte. Pour cela on s'est basé sur la position des sources d'influence (rivières, ports), des régions

naturelles et sur la connaissance de la sédimentologie et des communautés benthiques. Sur ces locations on a chaque fois pris 15 échantillons au hasard à l'intérieur d'une région de 0.6km^2; il en résulte un total de 135 échantillons. L'analyse du benthos montre qu'il y a parfois une grande variation de caractéristiques du benthos dans une location. Mais en général on constate un appauvrissement dans la diversité, densité et masse biologique vers l'est. Une analyse détaillée a permis de lier les différentes échantillons à un des trois types habitat. Ainsi on a pu tirer les conclusions suivantes concernant la stratégie dérivée de prise d'échantillons: (1) Le maintien des neuf locations donne un bon étalement spatial; (2) une augmentation du nombre d'échantillons dans l'habitat Abra alba dans la région côtière de l'ouest et du milieu est nécessaire; (3) une réduction significative du nombre d'échantillons dans l'habitat de la région côtière de l'est et un maintien ou une réduction légère dans les autres zones côtières; (4) l'habitat Nephtys cirrosa se trouve principalement dans la zone côtière de l'ouest avec un nombre suffisamment grand d'échantillons, mais une analyse plus approfondie de la présence dans la zone côtière du milieu est à sa place.

On disposait amplement de données pour l'élargissement des données de référence vers les différents habitats dans la zone côtière belge (des données d'origine belge (Ugent, ILVO), française et hollandaise). Les données obtenues entre 1994 et 2004 montraient le mieux la variabilité temporaire et spatiale dans le benthos échantillons à l'intérieur de la zone côtière belge (<6 milles) et étaient choisies comme données de référence. Aussi par une analyse détaillée des communautés on a pu lier ces données aux trois principaux types d'habitat de telle sorte que pour chaque type d'habitat suffisamment d'échantillons étaient disponibles afin de définir les valeurs limites référentielles, recueillies dans le rapport.

1. Introduction

The Water Framework Directive (2000/60/EG) of the European Parliament and of the Council was implemented in 2000 and aims to achieve a good ecological and chemical quality status for all water types by 2015. The water types concerned were rivers, lakes, and coastal- and transitional waters. This 'good ecological status' corresponds with a more or less undisturbed habitat. The quality status of a water body can be determined based on the evaluation of biological, chemical and hydro-morphological quality elements. The concerned biological quality elements are phytoplankton, macroalgae – angiosperms, benthic invertebrates and fish. The quality status is determined based on the development of systems for ecological evaluation that are based on the integration of well defined biological quality criteria. Each of these quality criteria has to support a classification (bad, poor, moderate, good and high) aiming at measuring the 'health' of the system compared to reference (high level) conditions. WFD compliant bio-indicators and classification tools detecting impacts on structure and functioning of aquatic systems are needed for the ecological status assessment of surface waters. Furthermore, the WFD (article 8) requires Member States to have monitoring programmes for the quality elements in their waters, which should be operational since 22 December 2006.

The evaluation tool, which is selected to define the ecological status of benthic invertebrates in the Belgian coastal waters, is the Benthic Ecosystem Quality Index (BEQI). The BEQI is a multi metric method distinguishing three scale levels to assess the overall ecosystem functioning. The first level is the ecosystem level, which gives a reflection on the ecosystem functioning in the water body by evaluating the relation between macrobenthic biomass and system primary production. The second level is the habitat level, that attempts to evaluate changes in habitats due to anthropogenic pressures (land reclamation, dredging, hydrodynamic changes, …). The third level evaluates the changes in the benthos for a certain habitat compared to the reference situation of that habitat, based on four parameters: density, biomass, species richness and species composition. In other words, the BEQI multimetric integrates the information of the three levels and primarily aims at providing a signal that is capable of showing significant deviations from a defined reference state. For more information see Van Hoey et al. (2007a).
An important aspect within the BEQI is the use of the habitat approach, which presumed that there is a habitat typology within the water body. A habitat typology for the Belgian coast, based on biological community analysis is available (Degraer et al., 2003, Van Hoey et al., 2004, Derous et al., 2007). Based on this information, following main communities/habitats were defined: (1) the Abra alba – Mysella bidentata community characterised by high densities and diversity and mostly found in fine muddy sands (Abra alba habitat); (2) the Nephtys cirrosa community characterised by very low densities and diversity and found in well-sorted sandy sediments (Nephtys cirrosa habitat); (3) the Ophelia limacina – Glycera lapidum community characterised by very low densities and diversity and found in coarse sandy sediments (Ophelia limacina habitat); the Macoma balthica community characterised by low densities and diversity and found in muddy sediments (Macoma balthica habitat).

For the Belgian coastal waters, an attempt to assess the ecological quality status of benthic invertebrates was done within the REFCOAST project (Van Damme et al., 2006),), which was updated and optimised by Van Hoey et al. (2007b) in which the ecological status was described as 'moderate' for benthic invertebrates. The assessment was done with the Benthic Ecosystem Quality Index (BEQI). This first assessment showed some shortcomings, such as (1) *the low amount of reference samples to determine the reference values for the benthic parameters, and (2) almost no spatial coverage of the assessment samples within the 1 nautical mile zone of the Belgian coast. Consequently, the ecological status of benthic invertebrates and the reference conditions have to be re-determined. This is done within the current project by monitoring the quality element benthic invertebrates for the Belgian Coastal waters (< 1 nautical mile) (the assessment of the ecological status will follow later on) and secondly to re-determine the reference condition for the benthic invertebrates for the Belgian coast.*

2. Objectives

The project consists of two parts: (1) the monitoring of the quality element 'macrobenthos' following the formally to the European Commission reported frequency strategy, including an evaluation of this strategy after the first year (2007); and (2) evaluation of the availability and usefulness of the macrobenthic data of the Belgian Continental Shelf to describe the reference values.

2.1. Macrobenthos monitoring

In the first part of this project, the macrobenthos of the Belgian coast is monitored in the context of the WFD, with the design defined in 3.1. The following biological and physical parameters were measured:

- *density*
- *diversity (number of species)*
- *species composition*
- *biomass*
- *sedimentology and depth*

The monitoring strategy will be evaluated after the first sampling year (2007), to optimise the efficiency of the monitoring program.

2.2 Evaluation of the availability of reference data

The reference values for the community parameters of the macrobenthic communities/habitats in the coastal area of the Belgian Part of the North Sea have not yet been determined. Except for the Abra alba habitat and which is reported in the technical report of the intercalibration, but more data will increase the significance of the reference. These values are necessary to determine the present status of the macrobenthos (based on the BEQI method). Within this part of the project, the availability and usability of the macrobenthic data on the communities in the Belgian marine waters is investigated in order to use them to determine and refine the reference values. A proposition of the reference period and the availability of reference samples per benthic community will be included.

3. Macrobenthos monitoring

3.1. Performed sampling strategy

The Belgian coast was divided into three zones, in which the most important harbours and/or estuaries are situated: (1) a western zone, from the French border to Middelkerke, including the Yser estuary; (2) a central zone, from Middelkerke to De Haan, including the harbour of Ostend; and (3) an eastern zone, from De Haan towards the Scheldt estuary, including the harbours of Blankenberge and Zeebrugge. The sampling points were all situated within the 1 mile zone of the coast and their positions within the three zones were chosen in function of:

1. *Position of the Belgian harbours / Estuary of the Yser and Scheldt*

   The harbours of Nieuwpoort, Ostend, Blankenberge and Zeebrugge and the estuaries of the Yser and Scheldt play important roles within the possible pollution of the coastal waters and the related bottom fauna. It is therefore important to locate the sampling points in the neighbourhood of those sources of pollution. The current patterns and mud depositions in the neighbourhood of the coastal harbours show that possible pollution within the coastal waters has to be investigated at the west, as well as at the east of harbours and estuaries (Fettweis et al., 2007).

2. *Special zones for nature protection.*

   Some areas for nature conservation were located within the coastal zone of the BCP and protected under the Habitat directive (92/43/EEC), the Bird directive (79/409/EEC) and Ramsar agreement (Iran, 1971). Given their status, it is important that those areas are monitored under the Water Framework Directive.

3. *Sedimentology*

   Maps with the sedimentology (median grain size and mud content, Figure 1) were consulted while choosing the sampling locations, due to close functional relation between macrobenthos and the sedimentology. The sampling locations were chosen in such way that all sediment types were sampled.

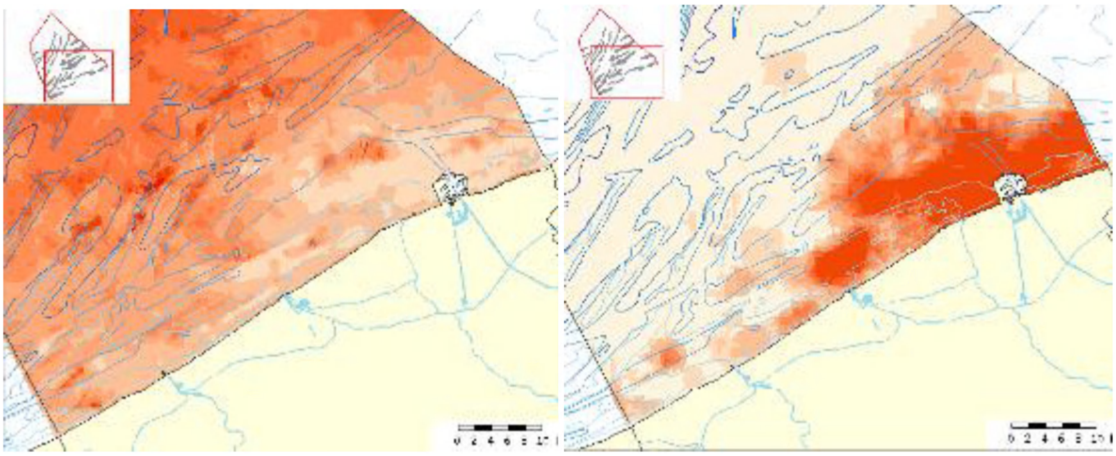


Figure 1: Median grain size (left) and mud content (right) (www.vliz.be/projects/bwzee).

4. *Benthic communities*

   Besides some transitional communities, four different macrobenthic communities were found on the Belgian Continental Shelf (Degraer et al., 2003; Van Hoey et al., 2004). Based on this information and information from ILVO-fisheries, a good impression of the distribution of the macrobenthic communities has been obtained. Additionally, the habitat suitability maps (Derous et al., 2007) have been used to get an idea about the possible occurrence of the communities on certain places. Based on this combined information, the sampling locations were determined so that there was a high probability that all communities were sampled.

5. *Accessibility of the sampling points in the light of long-term monitoring*

The Water Framework Directive requires a monitoring programme for the coastal waters within 1 nautical mile. This zone is locally very shallow (< 5m), and many ship wrecks can cause sampling difficulties, so the accessibility is not always self-evident. In the light of long-term monitoring for the WFD, it is imperative that the sampling locations are situated on relatively easy reachable places.

Based on these five criteria, nine sampling locations were determined within the 1 nautical mile zone of the BCP (Figure 2 and Table 1).

With the above described positions as centroïd, 15 samples of 0.1 m² were randomly taken at each location in an area of 0.6km² around the central point, so in total 135 samples will be taken (Figure 3). The form of each sampling location depended on the topology and the expected presence of the different habitats. It is assumed that with 15 samples per locations, the sampling surface will be enough to fulfil the demands of the BEQI-index. Concerning the Abra alba community,, a total sampling surface of 1.5km² will be enough for an 'OK assessment' (Van Hoey et al., 2007a). In the case of apparent insufficient sampling during the first stage of the program, there will be an increase of samples per location from 2008 onwards.

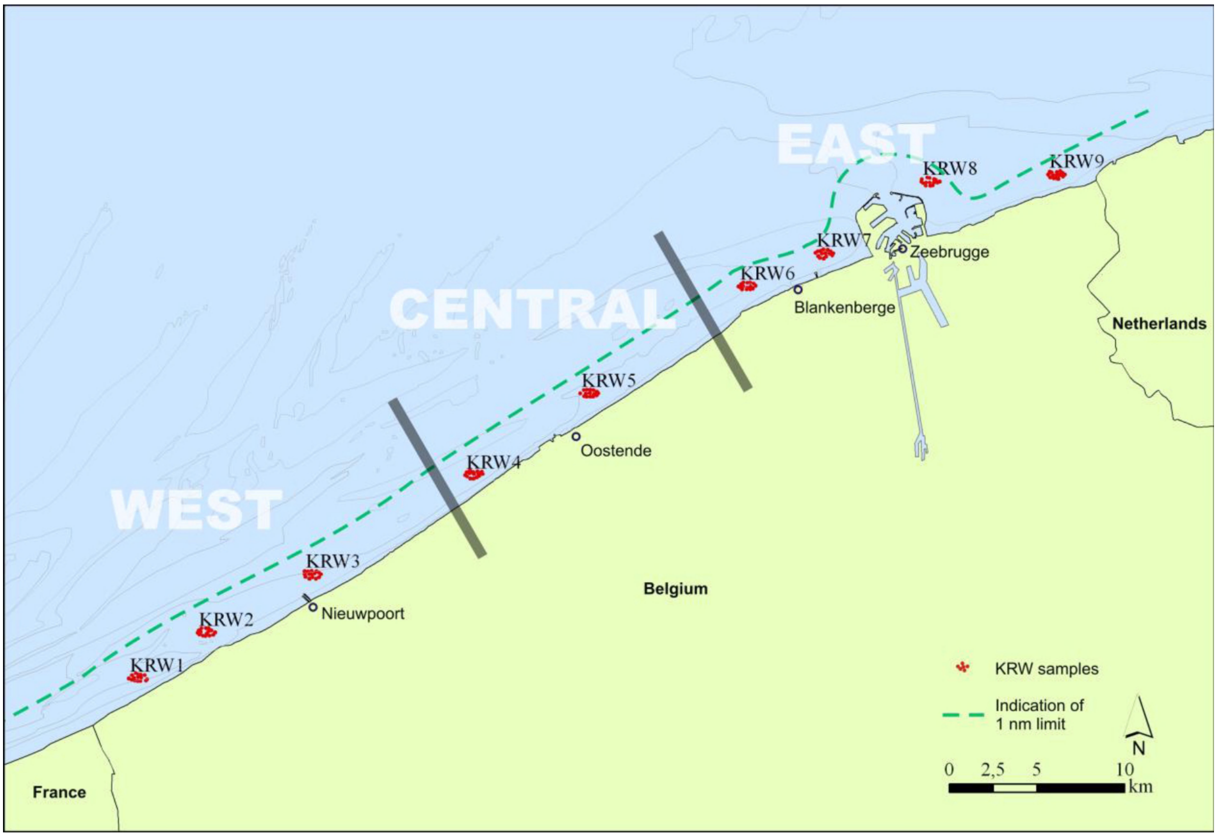


Figure 2: Position of the sampling locations (WGS84)

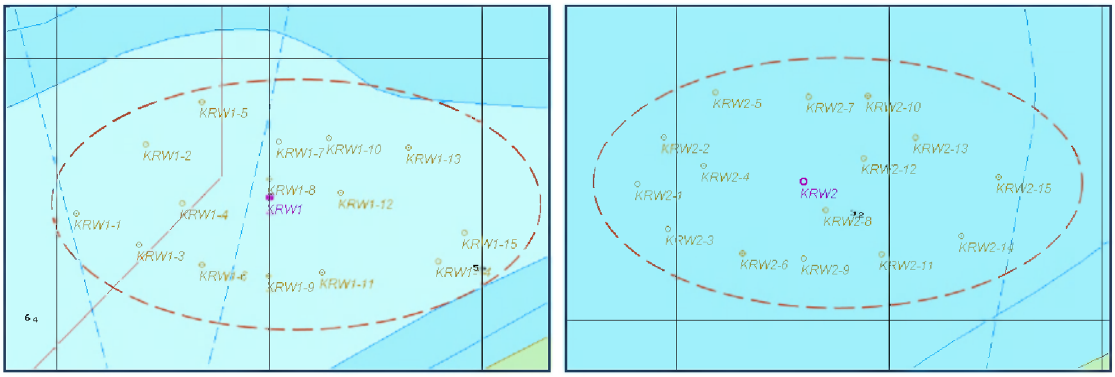


Figure 3. Position of the samples at each location (KRW1 and KRW2)

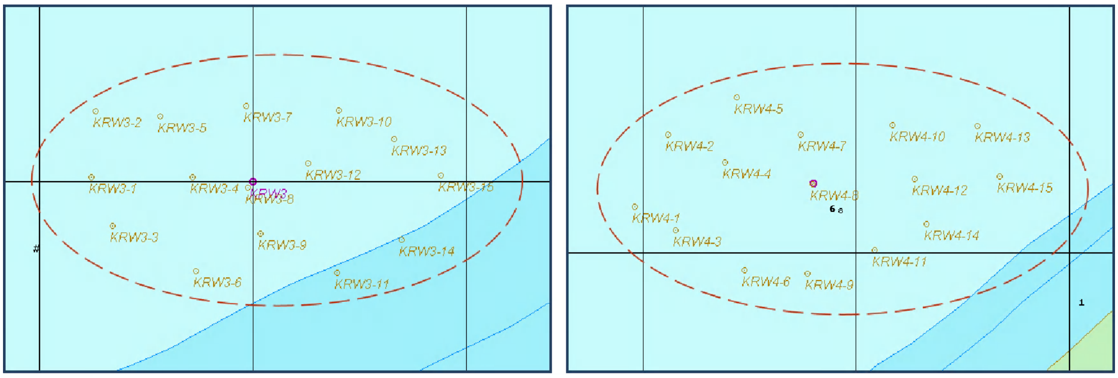


Figure 3 (continued). KRW3 and KRW4

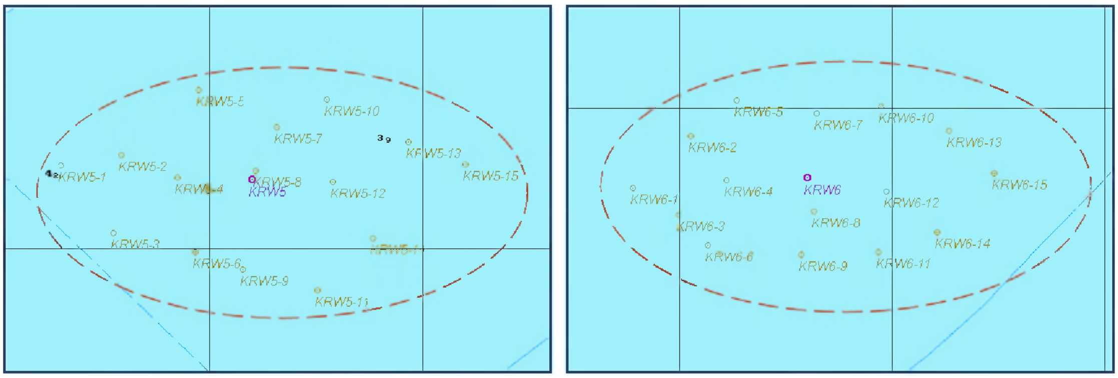


Figure 3 (continued). KRW5 and KRW6

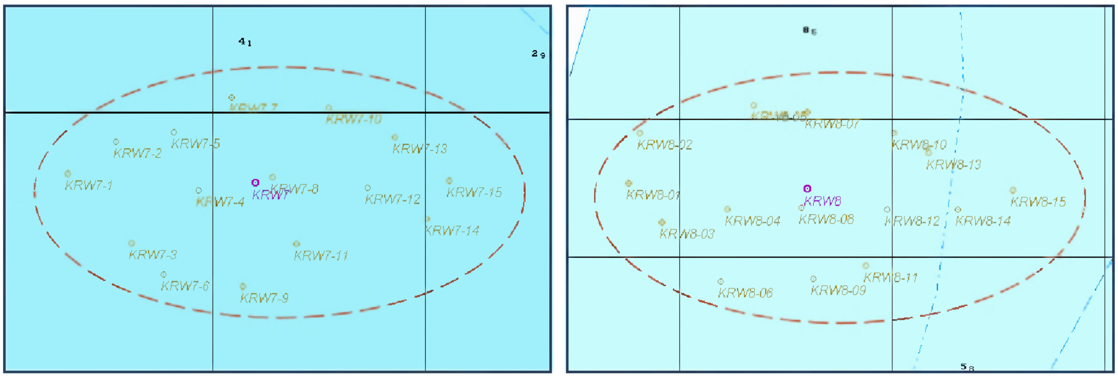


Figure 3 (continued). KRW7 and KRW8

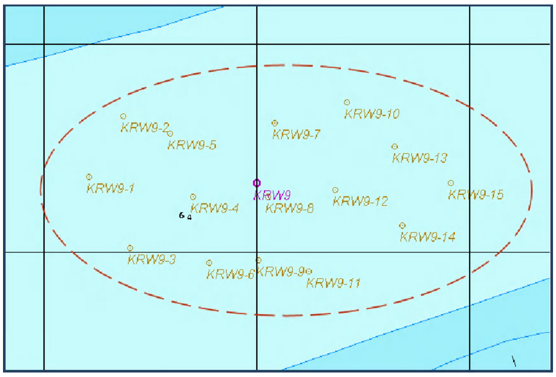


Figure 3 (continued). KRW9

Tabel 1. Position of the different sampling locations with indication of the depth, distance to the coast, possible factors influencing these locations and the expected macrobenthic community.

Station	Latitude	Longitude	Depth	Distance to the coast	Influenced by	Expected community
KRW1	*51°06.80 N*	*002°35.00 O*	*≈ 6.0 m*	*≈ 0.4 nm*	*Harbour Duinkerke (F)*	*Abra alba*
KRW2	*51°08.20 N*	*002°38.30 O*	*≈ 3.0 m*	*≈ 0.5 nm*	*Harbour Duinkerke (F)* *Yser estuary* *Harbour Nieuwpoort*	*Ophelia limacina*
KRW3	*51°10.00 N*	*002°43.50 O*	*≈ 5.5 m*	*≈ 0.6 nm*	*Yser estuary* *Harbour Nieuwpoort*	*Abra alba*
KRW4	*51°13.10 N*	*002°51.40 O*	*≈ 6.5 m*	*≈ 0.5 nm*	*Harbour Oostende*	*Abra alba of Nephtys cirrosa*
KRW5	*51°15.60 N*	*002°57.10 O*	*≈ 4.0 m*	*≈ 0.6 nm*	*Harbour Oostende* *Dumping site Oostende*	*Abra alba*
KRW6	*51°18.90 N*	*003°04.80 O*	*≈ 5.5 m*	*≈ 0.6 nm*	*Harbour Blankenberge* *Harbour Zeebrugge*	*Macoma baltica*
KRW7	*51°19.90 N*	*003°08.60 O*	*≈ 3.0 m*	*≈ 0.5 nm*	*Harbour Zeebrugge*	*Insufficiënt data*
KRW8	*51°22.10 N*	*003°13.80 O*	*≈ 8.0 m*	*≈ 0.6 nm*	*Harbour Zeebrugge*	*Macoma baltica*
KRW9	*51°22.30 N*	*003°20.00 O*	*≈ 6.5 m*	*≈ 0.6 nm*	*Harbour Zeebrugge* *Scheldt estuary* *Dumping site Zeebrugge Oost*	*Abra alba*

All 135 samples were taken in the period 8-10 October 2007 during a Belgica campaign (st0723) and at 12 and 15 October 2007 with the Stream for the shallow stations. Of these samples one (KRW2-15) is lost due to bad fixation.

3.2. Material and methods

3.2.1 Data gathering

The benthic samples were taken with a Van Veen grab (0.1 m²) and fixed with an 8% formaldehyde solution. The samples were afterwards sieved on a 1 mm sieve. The species in the samples were determined to species level when possible and their number counted. Quality control of the determinations was performed by double control of some of the species /samples determinations by different persons within the institute. The biomass (Wet Weight and Ash Free Dry Weight) was determined per species following a standardised protocol (24 h drying by 110°C for determining dry Weight and 2 h burning by 450°C for determining Ash Weight) (see annex 6.6).

A sediment sample was taken by a core out of each Van Veen grab. This sample was dried by 60°C and analysed with a Malvern Mastersizer 2000 following a standardised protocol (see annex 6.7). Also depth and position of the sample was registered during the campaigns.
All benthic data were delivered to the IDOD database of the BMM.

3.2.2 Data analysis

In this project report were dıfferent biological parameters calculated by dıfferent tools, which will be shortly outlined in this section.
First of all, the species data set is standardized by lumping some species (Cirratulidae spp, Spio spp, Anthozoa spp). For the multivariate analyses were also species removed from the dataset because they did not belong to the macrobenthos sensu strictu (eg. Mysidacea). Nematoda were excluded because of inadequate sampling techniques quantıfying meiofauna, as well as the station (KRW5-3) lacking biota.
The univariate parameters calculated were: (1) density (ind./m²); (2) biomass (g AFDW); (3) number of species (N_0). Also the Hill diversity index N1 was used in the analysis, which is the exponential form of the Shannon-Wiener index (exp H') (log base 2) and give lesser weight to the rarer species (Hill, 1973).
The multivariate analysis used were cluster analysis by group averaging based on Bray-Curtis similarity dataset. This clustering was visualised by using a non-metric Multi Dimensional Scaling analysis (MDS). A SIMPER analysis was performed to examine the contribution of each species to the average similarity within a cluster group. All these multivariate analysis were performed with the PRIMER statistical program (version 5.2).

3.3 Benthic community structure at the sampling zones/locations

3.3.1 Density and diversity

A total of 90 species was identıfied, mainly belonging to the phyla Polychaeta and Crustacea (each 37%), followed by Mollusca (16%), Echinodermata (4%) and various (7%) (Nemertina, Anthozoa). The most dominant species were polychaetes: Nephtys hombergii (67%), Cirratulidae spp. (61%), Spio spp. (53%), molluscs Macoma balthica (51%) and Oligochaeta spp. (49%). The number of species (No) per sampled location varied from 0 (KRW5-3) to 32 (KRW1-4). The highest densities were observed in KRW4-4 (8360 ind./m²), the lowest in KRW5-3 (10 ind./m²).

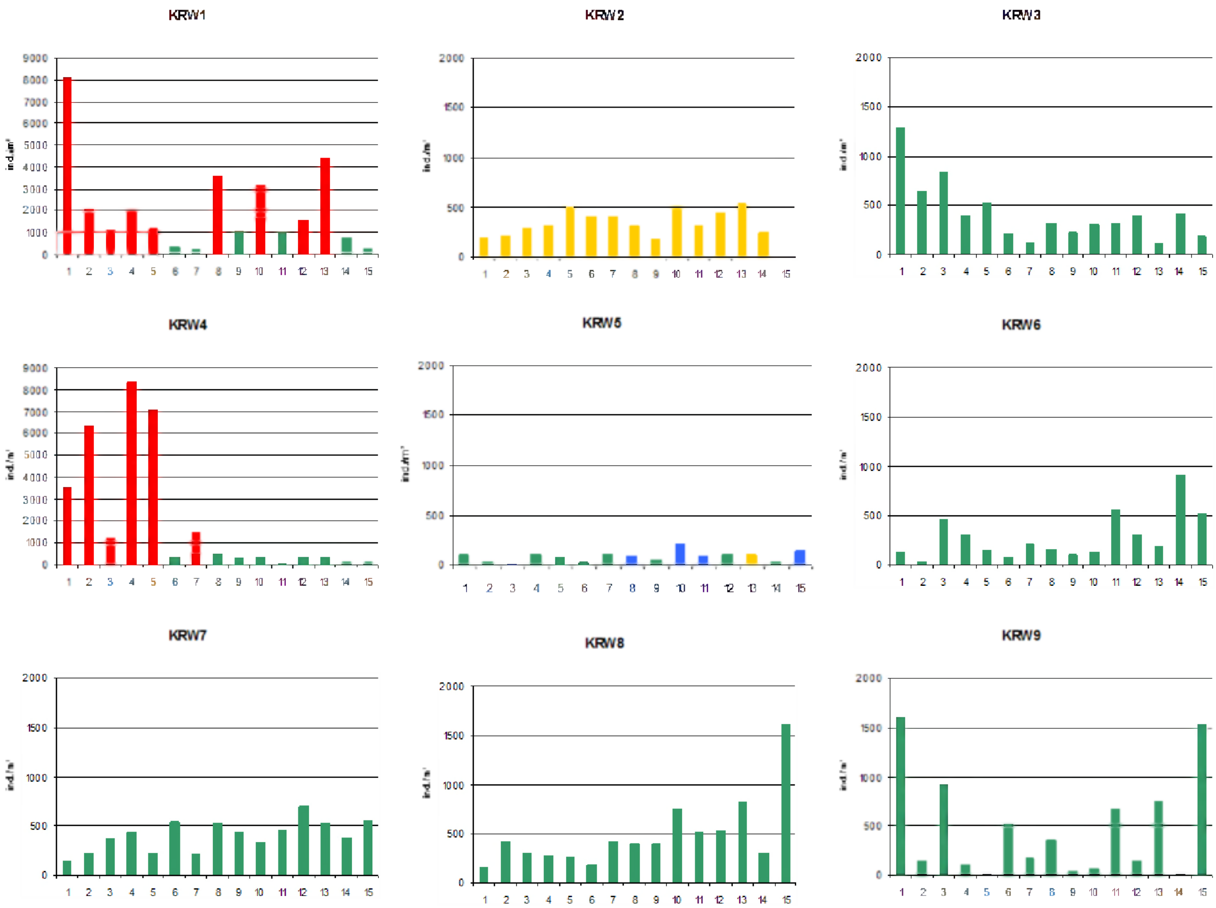


Figure 4. Density (ind/m²) per sample at the different locations. Y-axis: Density (ind/m²); X-axis: sample number.Red: Abra alba habitat; Yellow: Nephtys cirrosa habitat; Green: Macoma balthica habitat; Blue: Mixed/unknown.

When the density distribution is analyzed per sample and location, then the locations KRW1 and KRW4 showed the highest densities of up to more than 2000 ind/m² (Figure 4). The lowest densities were found in the samples of KRW5. At most locations there is a high variability in density between the samples, except for KRW2, KRW5 and KRW7.

Other diversity indices (N_0, N_1) were presented in figures 5 and 6. The number of species found per sample at a certain location can vary strongly within a location or rather the same. Most variation was found at location KRW4 (varying from 4 to 27 species) and KRW1 (9 to 34 species). The number of species was mostly low at locations KRW2, KRW5, KRW6, KRW7, KRW8, KRW9 (< 15 species per sample).

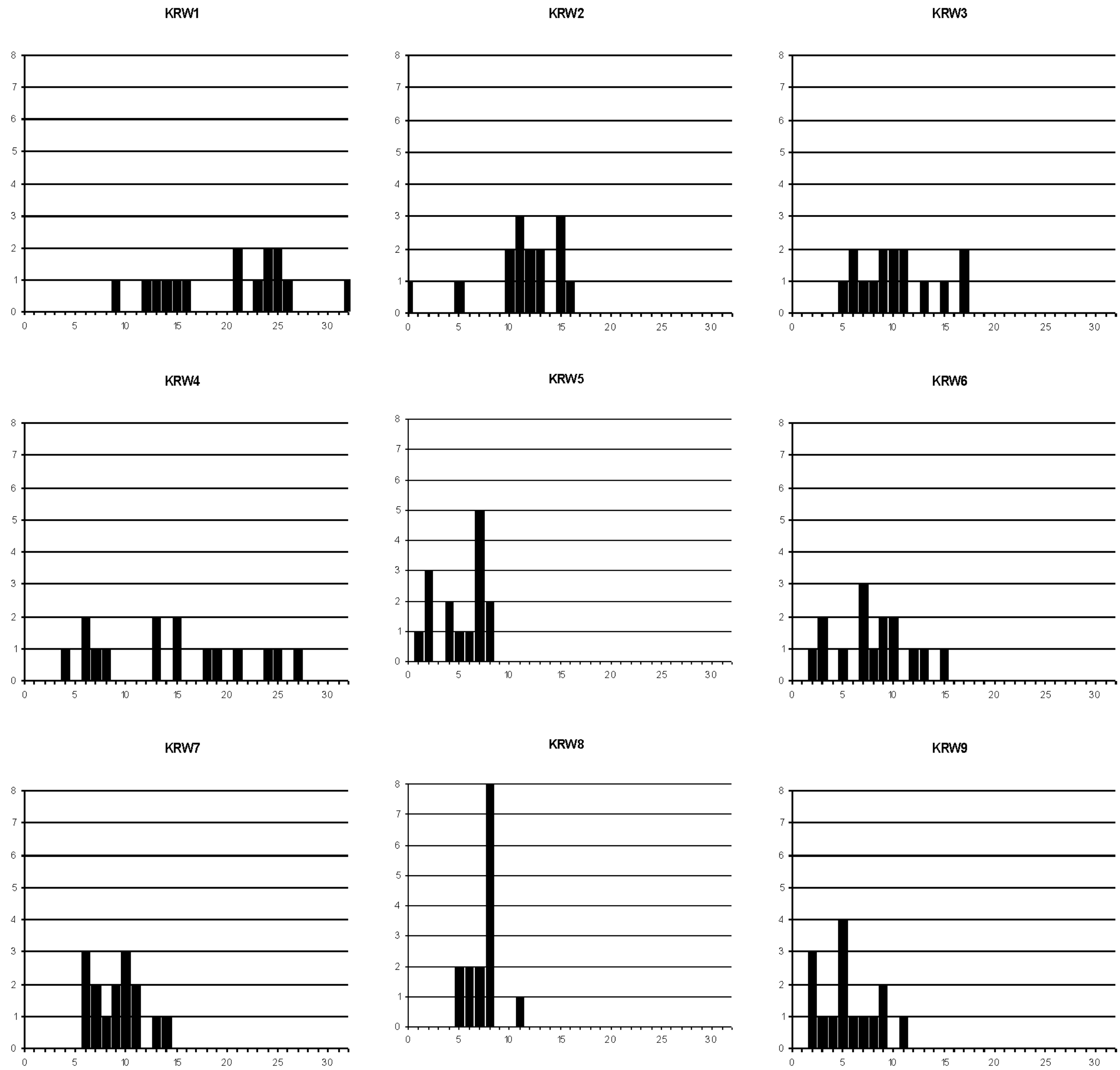


Figure 5. The number of samples that contain a certain amount of species per location. Y-axis: number of samples; X-axis: number of species.

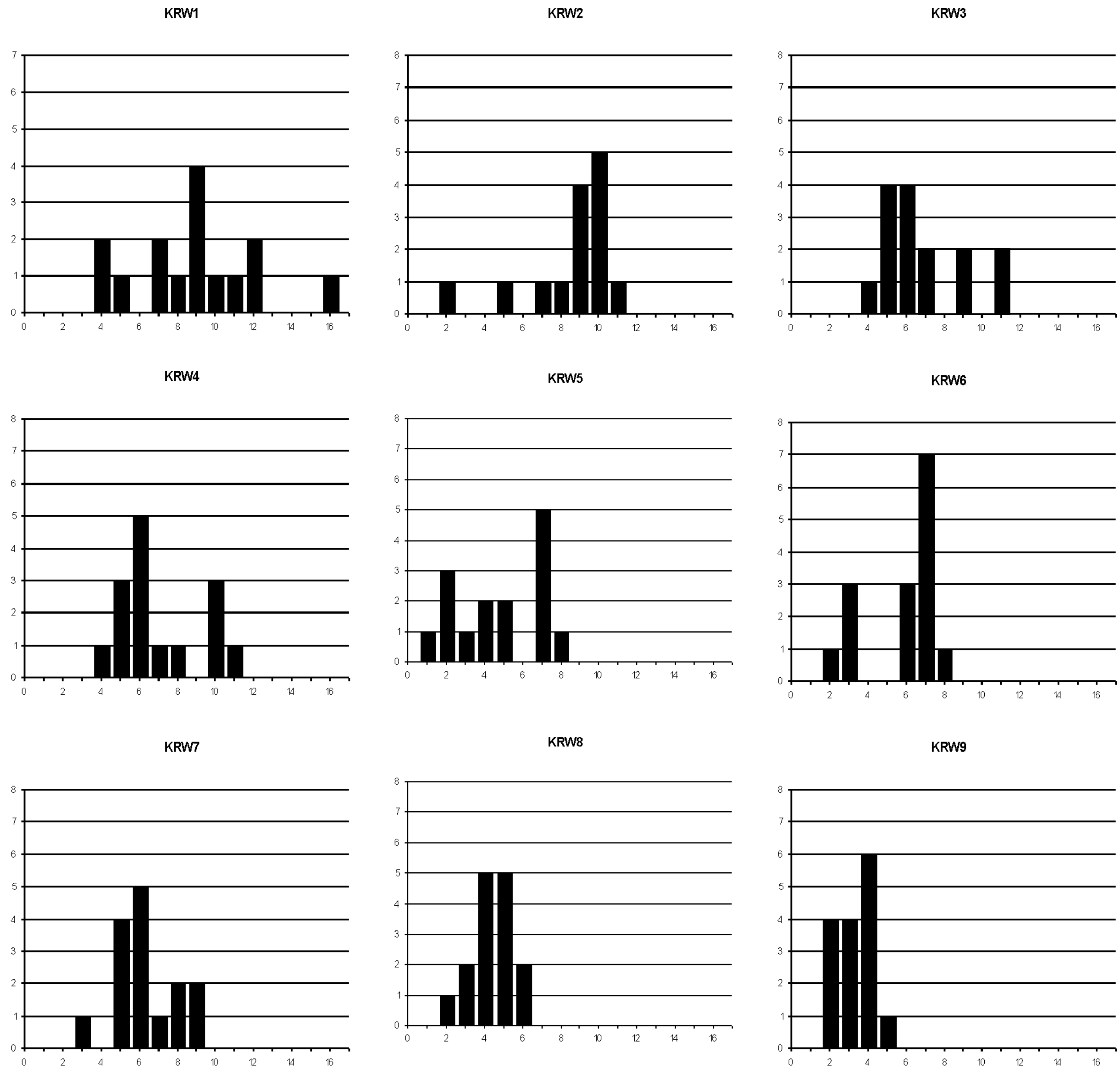


Figure 6. The number of samples that contain a certain value in N_1 per location. Y-axis: number of samples; X-axis: N_1 diversity index.

The diversity index N_1 is lowest in the samples at location KRW9 and KRW8 (<6). The highest values were recorded at location KRW1, KRW3 and KRW4. The other locations show intermediary values. The variability in the diversity index in the samples per location is lower than for the number of species.

3.3.2 Biomass

The total biomass (AFDW/m²) in the sampled KRW zones varied between 0.58 (KRW9) and 28.2 g (KRW1) (Figure 7). Zones 1, 2 and 4 showed the highest biomass, zones 8 and 9 the lowest. Molluscs were in nearly 60% of the samples responsible for more than 50% of the total biomass (Figure 8). Macoma balthica en Ensis spp were in most cases the dominant species. In the absence of many/large molluscs (eg zones 5 and 9) polychaetes (mainly Nephtys hombergii or Nephtys spp.) contributed the most to the total biomass. Occasionally present anthozoans or echinoderms (Ophiura spp, Echinocardium cordatum) (e.g. in zones 2 and 3) raised the total biomass sometimes to higher levels.

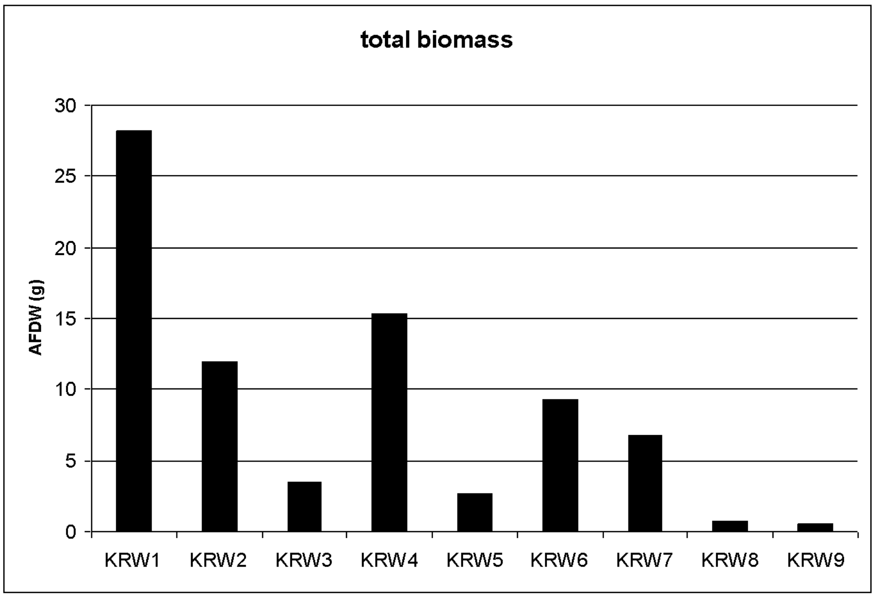


Figure 7. The total biomass (AFDW in g) per location.

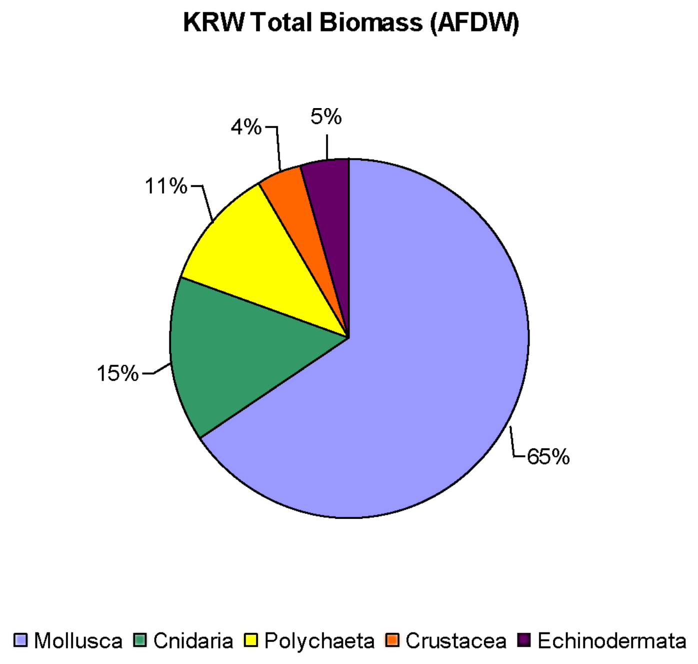


Figure 8. Proportion of the higher taxa in biomass.

3.3.3 Community analysis

Using Cluster and Multidimensional Scaling (MDS) all sampling stations per zone were assigned to one of the described macrobenthos communities in Degraer et al. (2003) and Van Hoey et al. (2004). Those communities/benthic habitats were: (1) the Abra alba – Mysella bidentata community (Abra alba habitat); (2) the Macoma balthica community (Macoma balthica habitat), (3) the Nephtys cirrosa community (Nephtys cirrosa habitat) and (4) the Ophelia limacina – Glycera lapidum community (Ophelia limacina habitat).

A similarity analysis using PRIMER based on a reduced species dataset of all KRW stations was carried out. The analysis was based on transformed (root-root) density data (# ind/m²).

A first MDS analysis showed a nice aggregation of nearly all stations within a zone. Except for zones 5 (Harbour Oostende, dredge spill site Oostende), 9 (Harbour Zeebrugge, Scheldt delta) and 4 (Harbour Oostende), showing a more variable distribution (Figure 9). This indicates that there is mostly a high similarity between the samples taken in one zone. For the assessment of the ecological status of the benthos it is important to classify the zones/samples to the four habitat types, wherefore a cluster analysis is performed (Figure 10, 11).

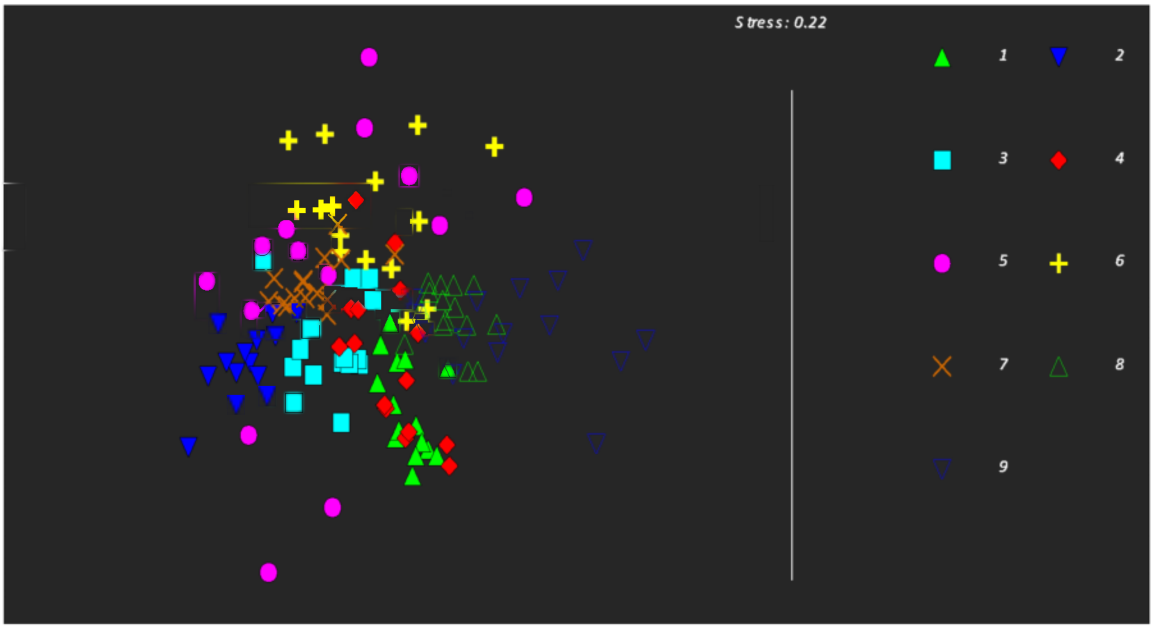


Figure 9. MDS of the benthos data, with indication of the different KRW zones.

Based on this cluster analysis (35% similarity) (Figure 10), the benthic data could be grouped into 7 clusters (Table 2). Each cluster was assigned to one of the benthic habitats, based on the typical species per cluster, average density, species richness and sedimentology. Also an indication is given which locations/samples belong to each cluster.

- *Cluster 1: is characterized by Oligochaeta spp., Nephtys hombergii and Macoma balthica, and very low average densities (46 ind/m²) and species richness (3 ind/0.1 m²). The sedimentology showed a high mud content (49.5%) and low median grain size (140 µm). Therefore this cluster can be classified under the Macoma balthica habitat. The samples, belonging to this cluster were mainly taken in the KRW5 and KRW9 zone.*

- *Cluster 2: is characterized by Cirratulidae spp., Oligochaeta and Abra alba, and a rather high average density (3679 ind/m²) and species richness (24 species/0.1 m²). The sedimentology showed a mud content of 10% and a median grain size of 185 µm. This cluster can be classıfied under the Abra alba habitat. Samples from KRW1 (Potje) en KRW4 (Oostende Harbour) zone belongs to this cluster.*
- *Cluster 3: is characterized by Cirratulidae spp. and Oligochaeta in lower densities. The average density is low (491 ind/m²) and low species richness (8 species/0.1 m²). This cluster is characterized by the lowest average median grain size of 120 µm and a high mud content (49%). This cluster was also classıfied under the Macoma balthica habitat. The samples belonging to this cluster were mainly taken in KRW 8 and KRW 9 (two KRW zones in the neighborhood of Zeebrugge Harbour) zone and some at KRW1, KRW4 and KRW6.*
- *Cluster 4: is characterized by Spio spp., Bathyporeia elegans and Macoma balthica in low densities. The average density is 239 ind/m² and a species richness of 7 species/0.1 m². The mud content (48%) is high and the median grain size (127 µm) low. Based on these characteristics this cluster is classıfied under the Macoma balthica habitat. The samples belonging to this cluster were taken at KRW6 (Blankenberge Harbour).*

Table 2. Indication of the amount of samples of each location found in each cluster.

Cluster	*1*	*2*	*3*	*4*	*5*	*6*	*7*
Habitat	*Macoma balthica*	*Abra alba*	*Macoma balthica*	*Macoma balthica*	*Nephtys cirrosa*	*Macoma balthica*	*rest*
KRW1	*0*	*9*	*5*	*0*	*0*	*1*	*0*
KRW2	*0*	*0*	*0*	*0*	*14*	*0*	*0*
KRW3	*0*	*0*	*3*	*0*	*0*	*12*	*0*
KRW4	*1*	*6*	*5*	*0*	*0*	*3*	*0*
KRW5	*5*	*0*	*0*	*0*	*1*	*4*	*4*
KRW6	*2*	*0*	*5*	*8*	*0*	*0*	*0*
KRW7	*0*	*0*	*0*	*0*	*0*	*15*	*0*
KRW8	*0*	*0*	*15*	*0*	*0*	*0*	*0*
KRW9	*4*	*0*	*11*	*0*	*0*	*0*	*0*
Avg mud	*49.5*	*9.9*	*49.25*	*48*	*3.13*	*22.1*	*23.7*
Avg Median	*139.75*	*184.7*	*119.75*	*126.75*	*246.5*	*158.46*	*197.5*
Avg density (ind/m²)	*46*	*3679*	*491*	*239*	*328*	*395*	*133*
Avg No	*3*	*24*	*8*	*7*	*12*	*10*	*7*
Avg N1	*2.8*	*8.1*	*5.2*	*5.3*	*8.4*	*7.0*	*6.0*

- *Cluster 5: is characterised by Nephtys cirrosa, Nepthys juveniles and Spio spp. The average density (328 ind./m²) is low, with a species richness of 12 species/0.1 m². The sediment characteristics show a low mud content (3%) and a high median grain size (247 µm), which indicates a sandy environment. Therefore this cluster is classıfied under the Nephtys cirrosa habitat. All samples of the KRW2 (Nieuwpoort Harbour) zone belongs to this cluster.*
- *Cluster 6: is characterized by Magelona spp., Nephtys juveniles, Nephtys hombergii and Macoma balthica. The average density is low 395 ind/m² and a species richness of 10 species/0.1 m². A mud content of 22% and a median grain size of 159 µm gives the*

indication that the samples within this cluster were fine sandy with a rather high mud content. Based on these characteristics, the cluster can be classified under the Macoma balthica habitat. The samples of this cluster were slightly more diverse than the other Macoma balthica clusters. The samples of this cluster were taken in KRW7, KRW3 (resp. West of Zeebrugge Harbour and East of Nieuwpoort Harbour) and some samples of KRW 4 and KRW5.

- *Clusters 7 group mainly the rest fraction (KRW5 samples), which were difficult to classify to one of the habitat types, because it shows similarities with the Nephtys cirrosa habitat, but also with the Macoma balthica. Therefore, these samples were not classified into one habitat type for the moment.*

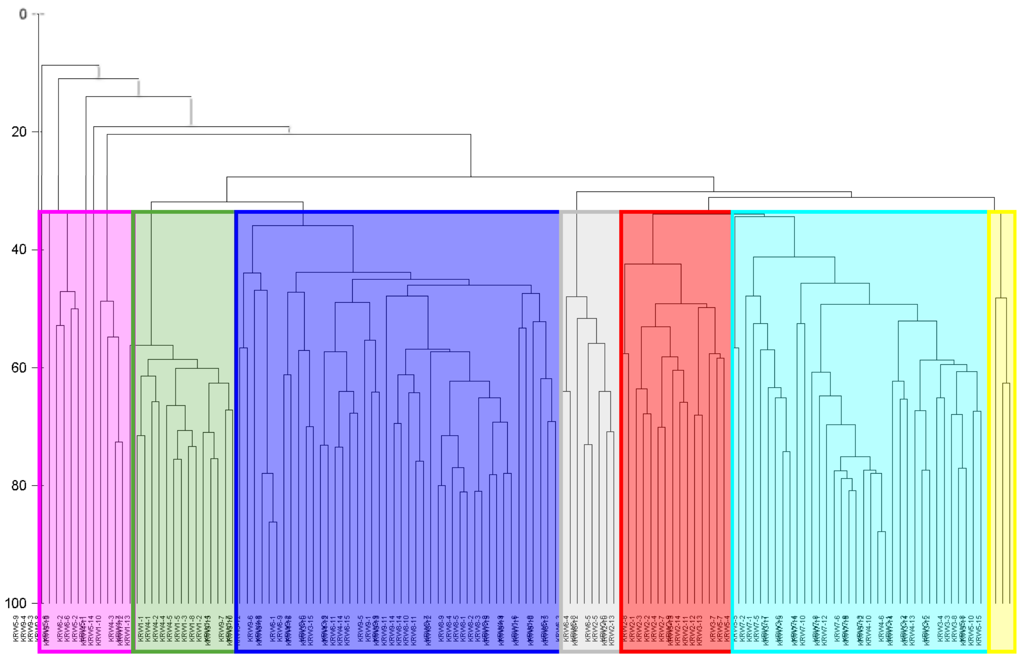


Figure 10. Cluster diagram of the benthic data 2007; with indication of the different clusters (numbered from 1 to 7 from left to right).

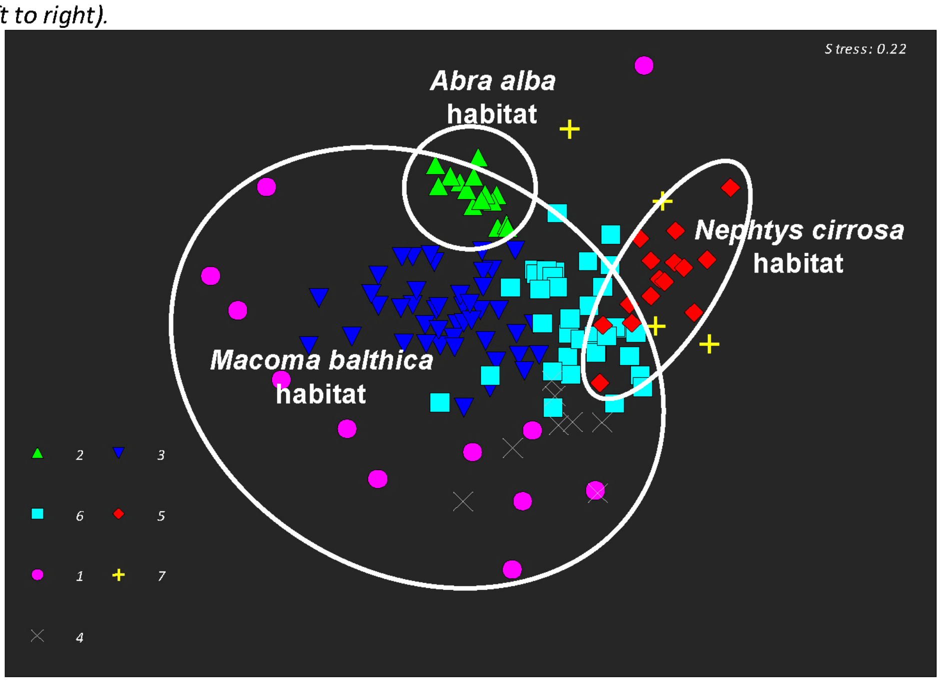


Figure 11. MDS plot of the benthic data of 2007 with indication of the cluster group. (numbers corresponding to the cluster diagram above).

Assigning the different zones and samples to one of the macrobenthic communities/habitats was in some cases obvious (KRW 2, 3, 6, 7, 8, 9). Other zones were more doubtful (1, 4 & 5), because more than 1 habitat type was found (Figure 12). KRW zone 1 was defined as an A. alba habitat (richest community, representing highest densities), with some samples with a higher mud content and linked to Macoma balthica habitat. The Abra alba habitat is more located towards the Trapegeer bank, whereas the Macoma balthica habitat is situated nearby the coastline (Figure 12). KRW zone 2 was initially predicted as a possible O. limacina habitat, but results of the multivariate analysis showed more similarities with a classic N. cirrosa habitat (in this zone the sediment was considerably coarser than in the other sampled KRW zones). KRW zone 3 proved to be more associated with the Macoma balthica habitat, based on the found species composition. KRW zone 4 shows on the basis of our analysis a mixture of communities, mainly Abra alba habitat and Macoma balthica habitat. The Abra alba habitat situated more offshore, whereas the Macoma balthica habitat is located nearby the coast (Figure 12). The same problem was for KRW zone 5, where too much variation in biota – with very low densities and number of species (same trend was observed in the sediment) made it impossible to group them to a certain macrobenthos habitat (Figure 12). It consists mainly of the Macoma balthica habitat, but there were some indications of a more sandy habitat sometimes (linking towards Nephtys cirrosa habitat). KRW zone 6, with its very muddy sediments was confirmed as the predicted M. balthica habitat. KRW zone 7 showed (cf. sediment data) some similarities with the Macoma balthica habitat in biota, whereas the sedimentology shows the potential of an Abra alba habitat. Both KRW zones 8 and 9 belonged to the M. balthica habitat. Sediment analyses from zone 9 were however in some cases contradictory to the found biota.
In the Belgian coastal zone (<1 nautical mile), three habitat types were found: (1) Macoma balthica habitat (along the entire coast); (2) Abra alba habitat (more situated in the Western part of the coast) and (3) Nephtys cirrosa habitat (in the Western part).

Due to the fact that the BEQI approach does the evaluation on habitat level in stead of sample level, the samples of the different KRW zones (Belgian coast is split up in 3 sub-areas) could be grouped following their habitat characteristics. Based on these pooled results (see 3.4), an evaluation of the sampling strategy is made, with some suggestions to improve it.

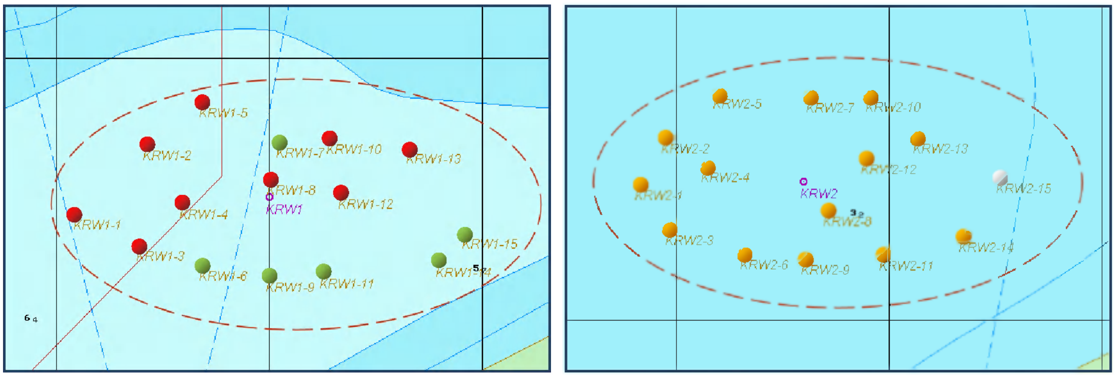


Figure 12. Visualisation of the habitat types at the sampling locations KRW1 and KRW2

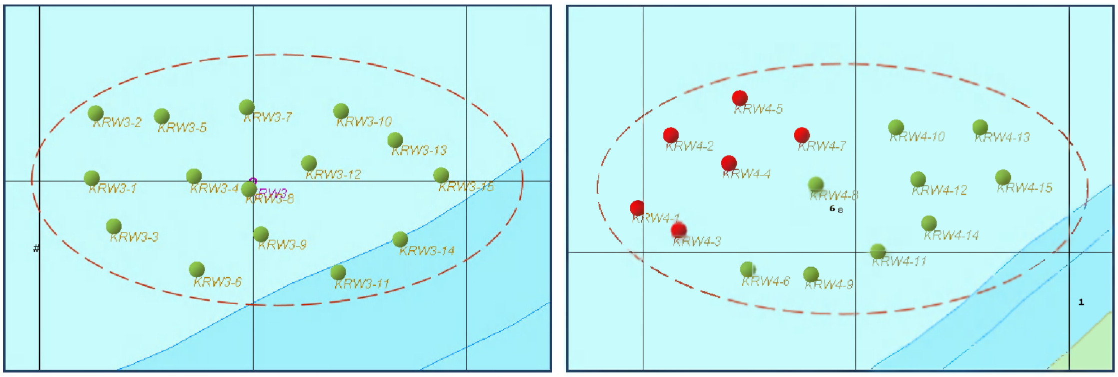


Figure 12 (continued) Visualisation of the habitat types at the sampling locations KRW3 and KRW4

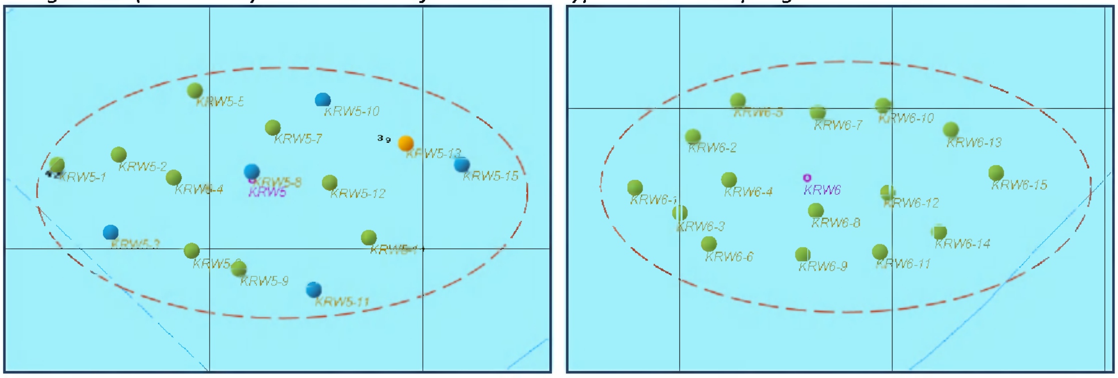


Figure 12 (continued) Visualisation of the habitat types at the sampling locations KRW5 and KRW6

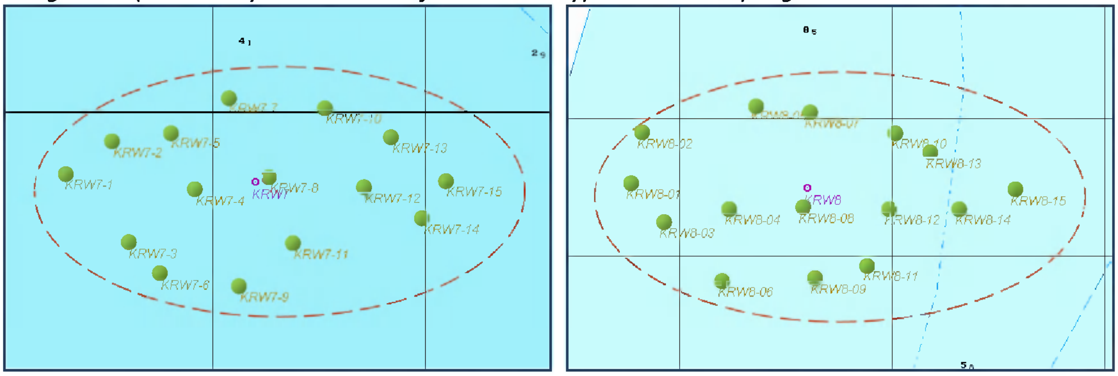


Figure 12 (continued). Visualisation of the habitat types at the sampling locations KRW7 and KRW8

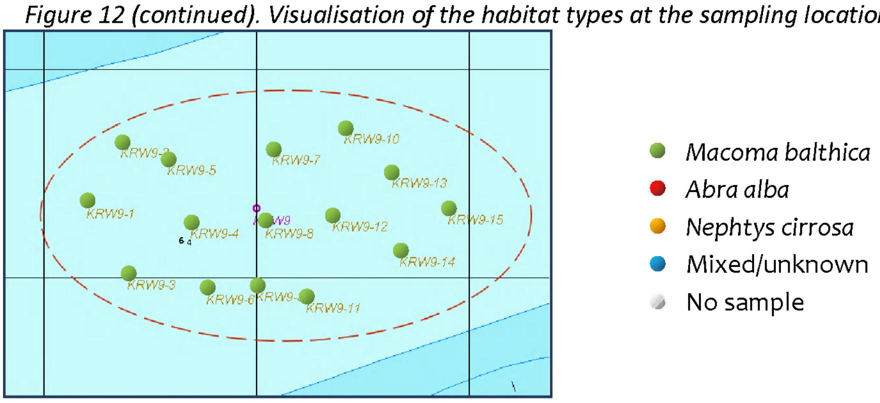


Figure 12 (continued). Visualisation of the habitat types at the sampling locations KRW9

3.3.4 Sedimentology

KRW 1

The medium grain size in KRW zone 1 varied between 50 and 220 µm with an average of 158 µm (Figure 13). Four sampling stations (6, 7, 9 & 11) in KRW zone 1 showed aberrant sediment compositions. In replicates 6, 9 & 11 the mud concentrations were considerably higher (>45%). Replicate 7 showed coarser sediments. These differences were also observed in their respective species compositions and abundances.

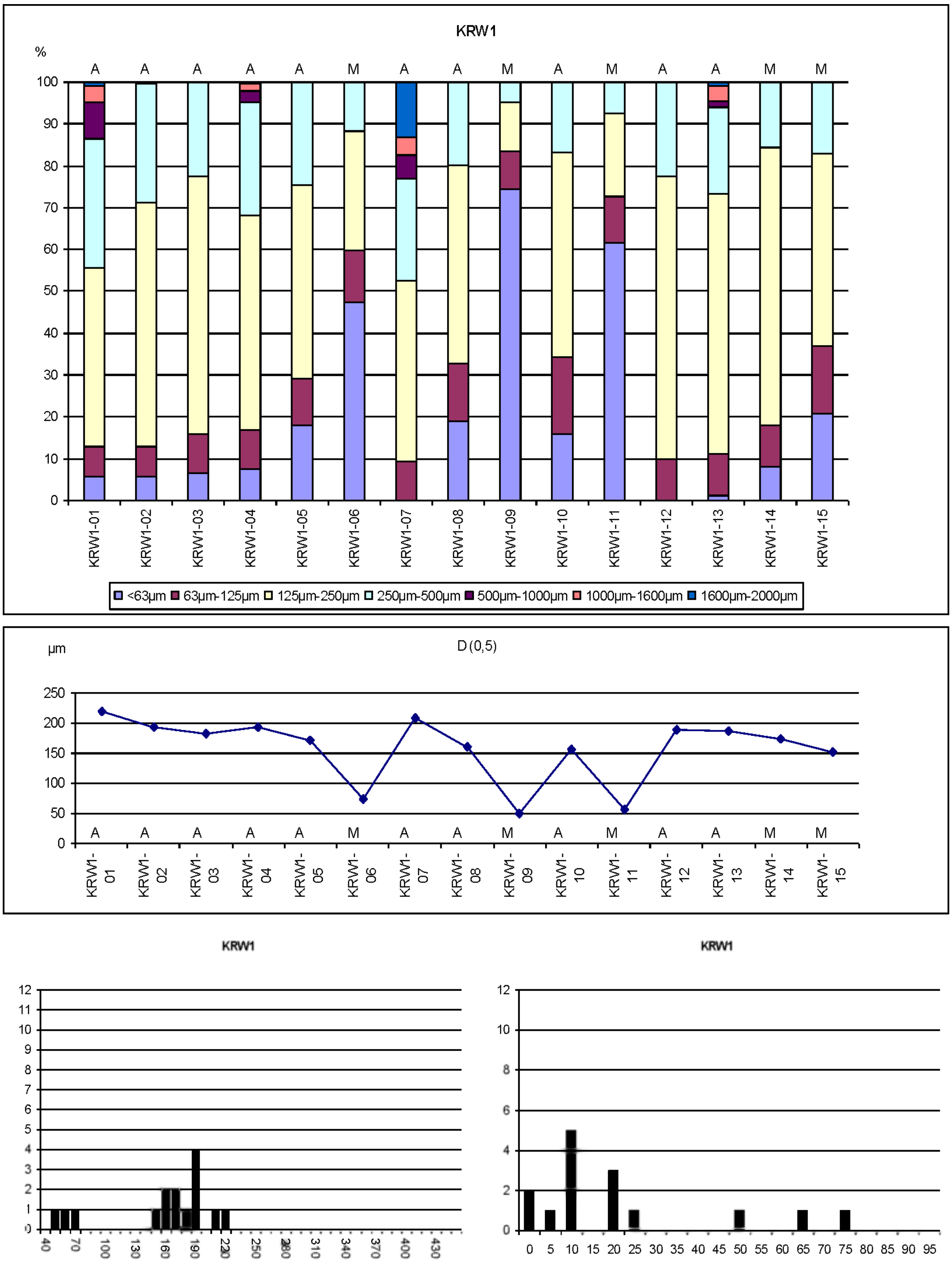


Figure 13. Sediment characteristics of KRW zone ., showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. A: Abra alba habitat; M: Macoma balthica habitat*

KRW 2

The medium grain size in KRW zone 2 varied between 156 and 290 µm with an average of 247 µm (Figure 14). All replicates except one (11) showed a homogenous sediment composition. In replicate 11 the mud content was considerably higher (>20%).

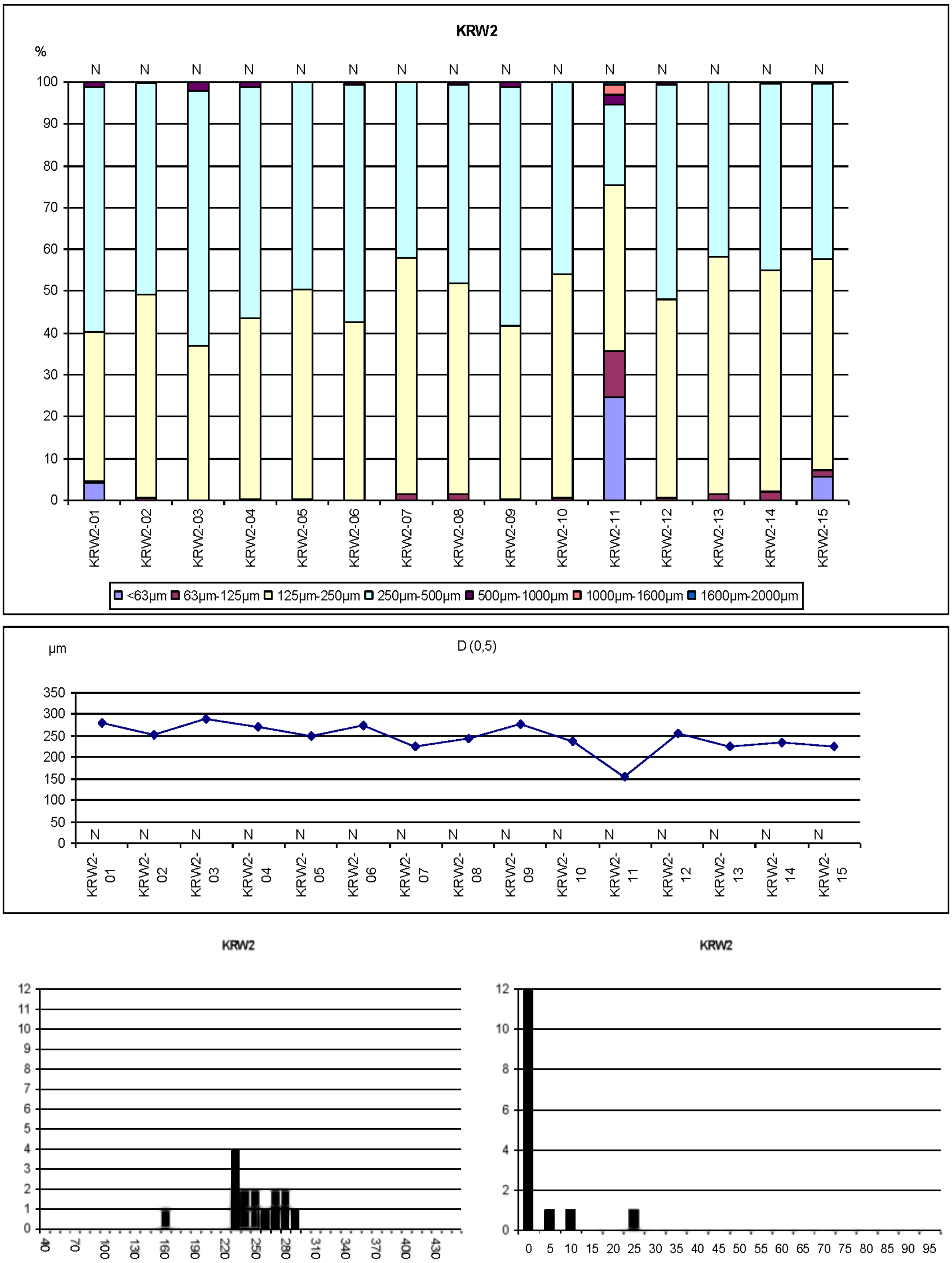


Figure 14. Sediment characteristics of KRW zone 2, showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. N: Nephtys cirrosa habitat*

KRW 3

The medium grain size in KRW zone 3 varied from 49 to 179 µm with an average of 138 µm (Figure 15). Despite of the very high mud concentrations in replicate 13 (> 75%), the sediment composition within this KRW zone is fairly homogenous.

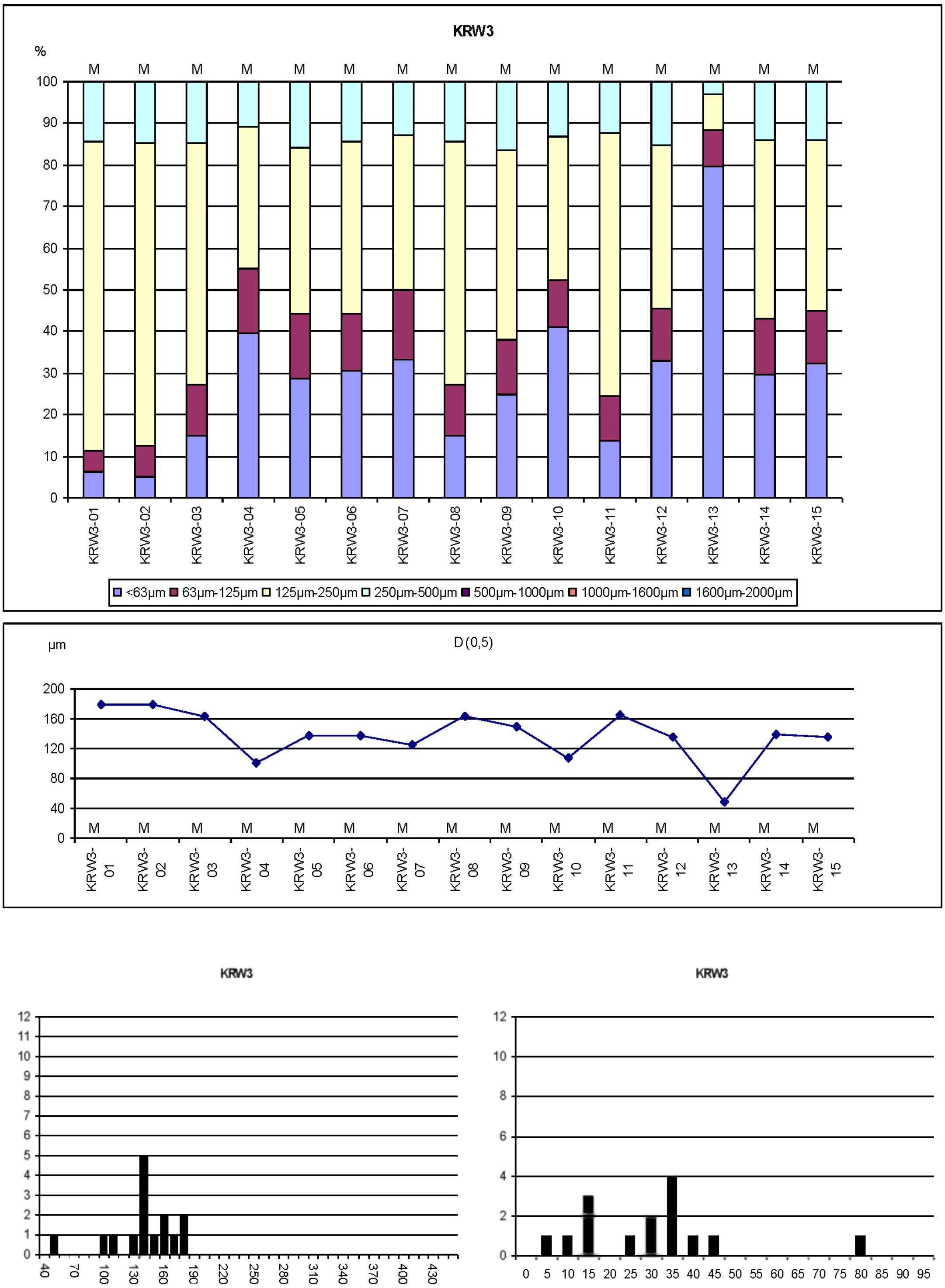


Figure 15. Sediment characteristics of KRW zone 3, showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. M: Macoma balthica habitat*

KRW 4

The medium grain size in KRW zone 4 varied between 108 and 203 µm with an average of 162 µm (Figure 16). Two replicates (7 & 8) were characterized by the absence of a mud fraction, whereas replicates 2 & 5 showed the presence of coarser fractions (> 500 µm; max. 12%)). Despite these differences the sediment composition within KRW zone 4 was fairly uniform.

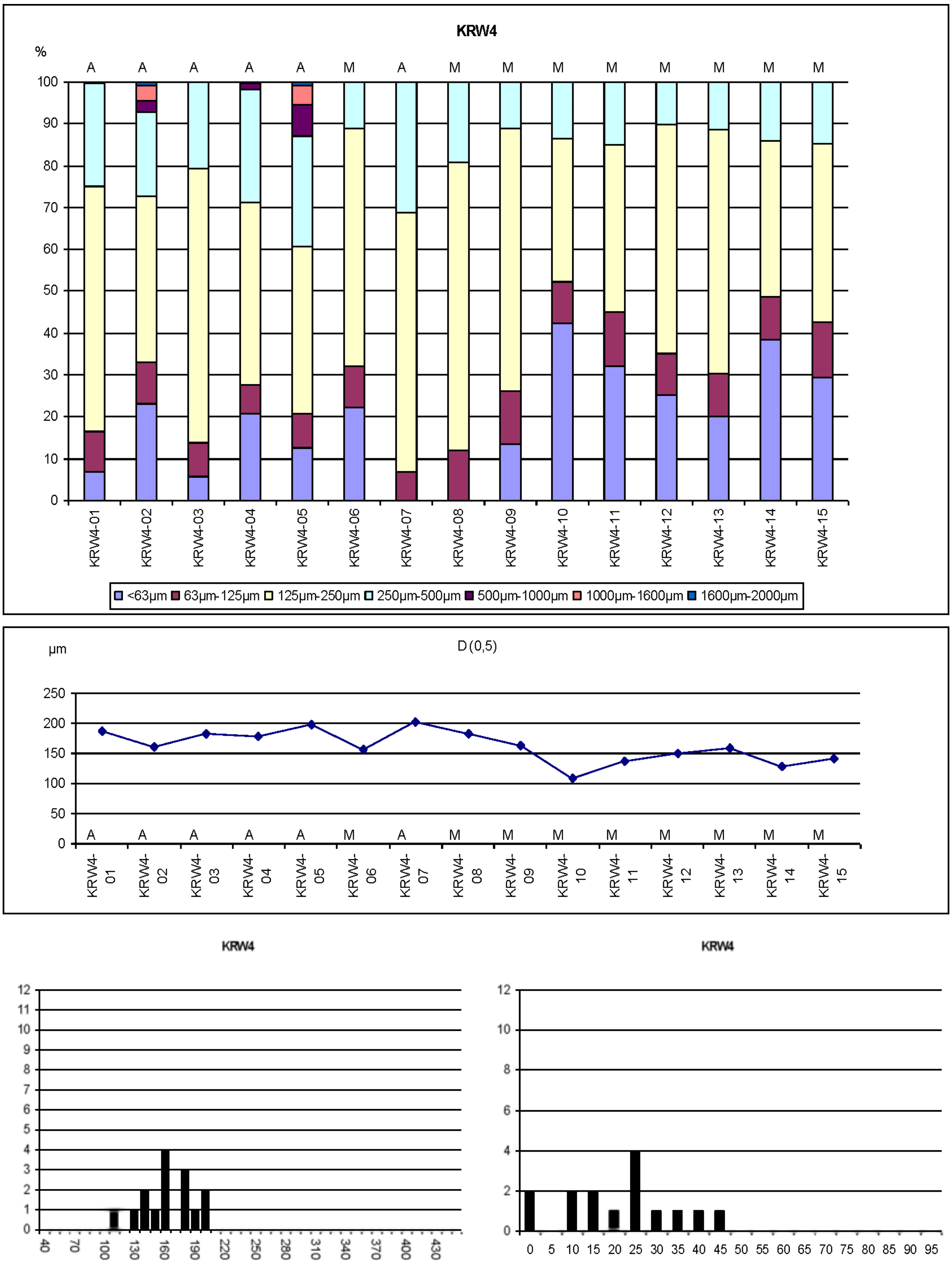
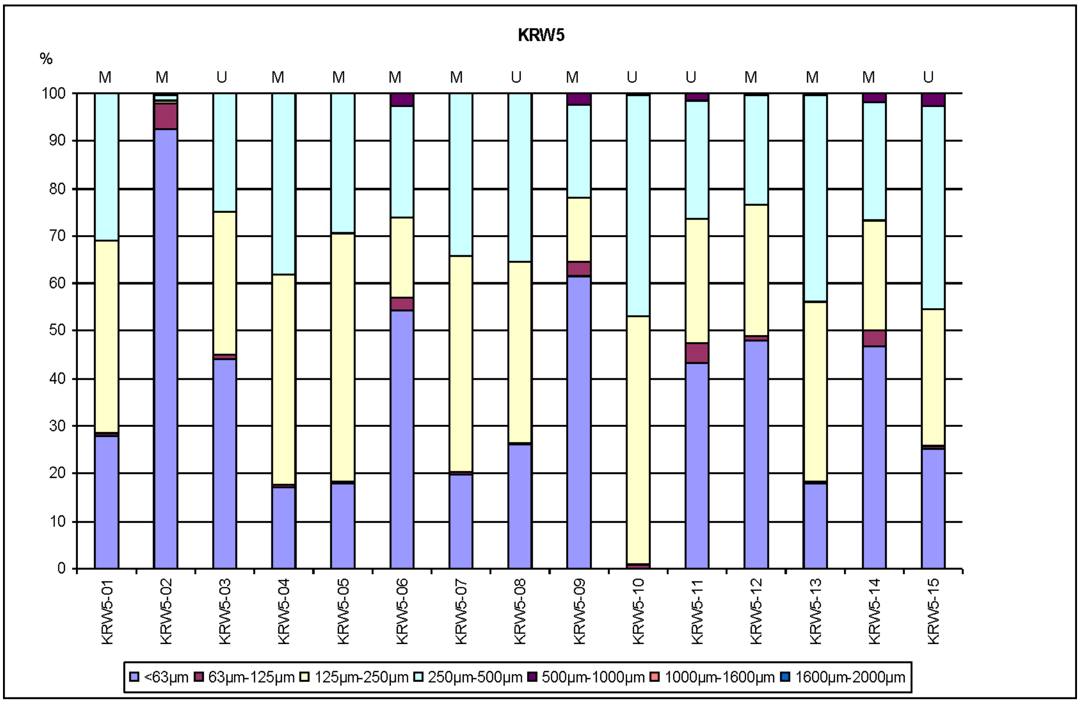
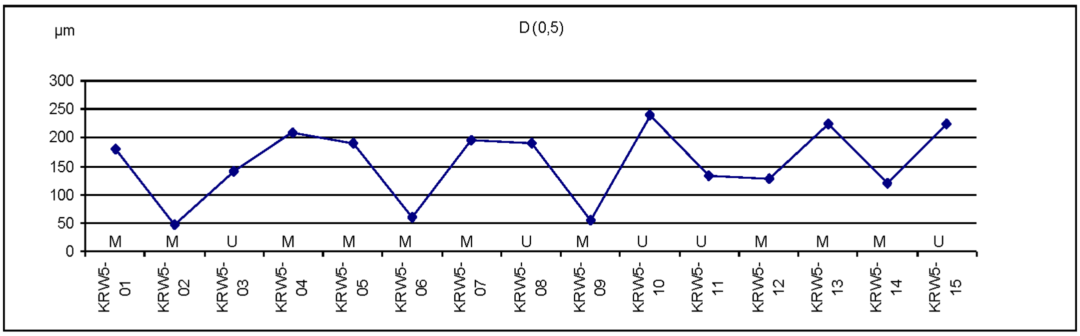


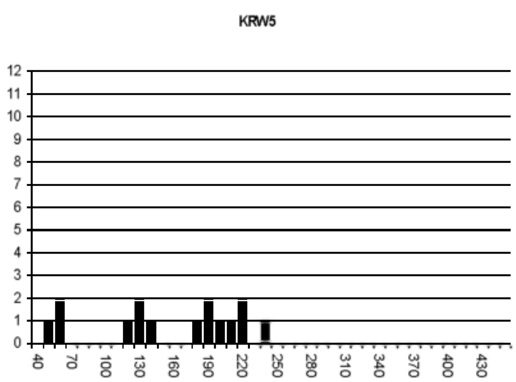
Figure 16. Sediment characteristics of KRW zone 4, showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. A: Abra alba habitat; M: Macoma balthica habitat*

KRW 5

The medium grain size in KRW zone 5 varied between 46 and 240 µm with an average of 156 µm (Figure 17). KRW zone 5 was characterized by considerable fluctuations in sediment composition (cf. medium grain size) between the replicate samples. Also the mud content proved also to be highly variable (from 0 to 90 %, resp. in replicates 10 & 2).







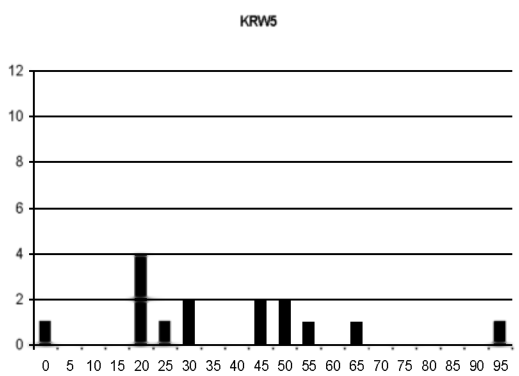


Figure 17. Sediment characteristics of KRW zone 5, showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. M: Macoma balthica habitat; U: unknown/mixed*

KRW 6

The medium grain size in KRW zone 6 varied from 49 and 313 µm with an average of 114 µm (Figure 18). Nearly all replicates were characterized by very high mud content (min 17%; max 82%). Besides that a considerable coarse sand fraction (500-100 µm; max 14%)) was also present in all replicates. The fluctuations in medium grain size as seen in the figures were the result of the ratio mud/coarse sand.

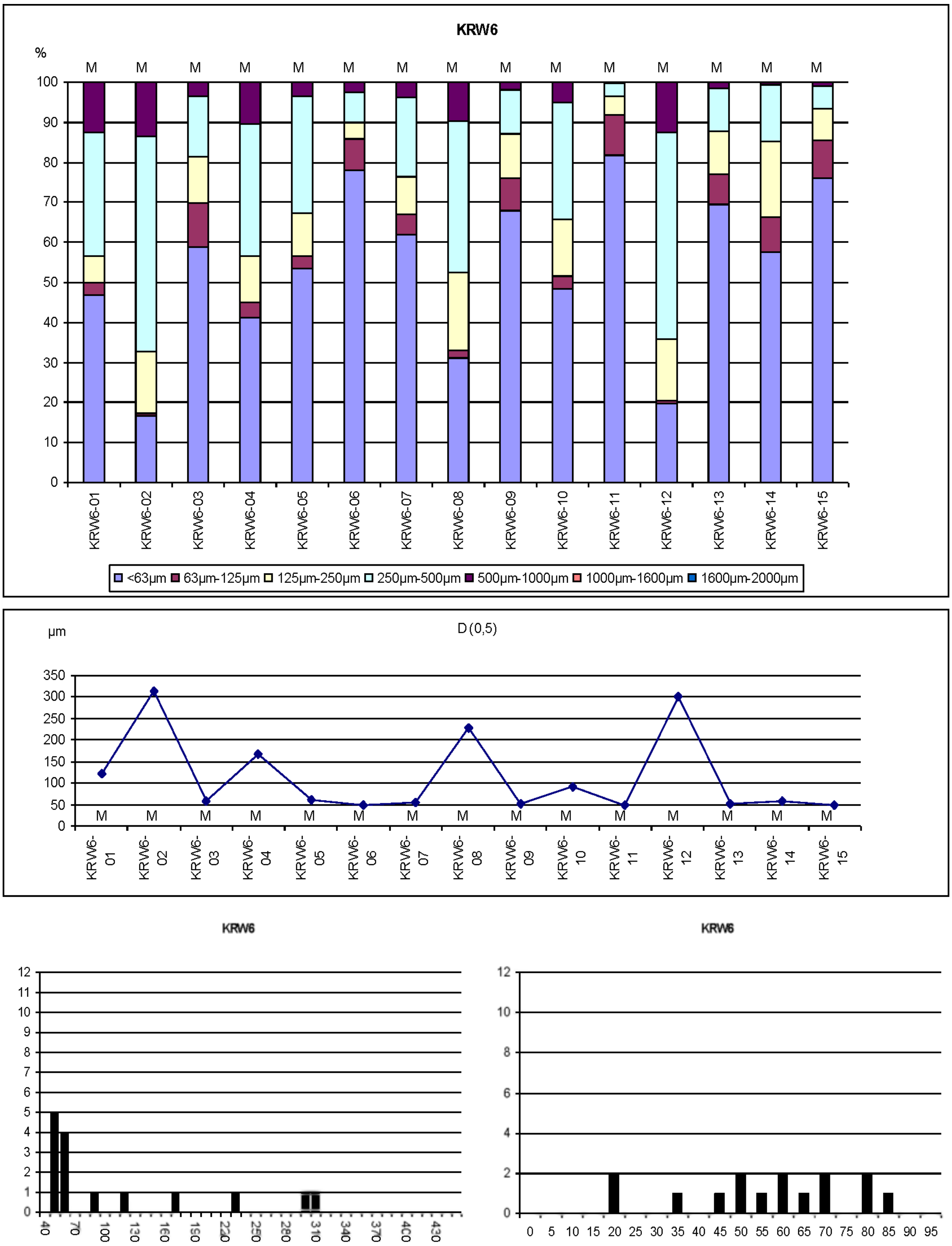


Figure 18. Sediment characteristics of KRW zone 6., showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. M: Macoma balthica habitat*

KRW 7

The medium grain size in KRW zone 7 varied between 48 and 197 µm with an average of 170 µm (Figure 19). Except for replicate 4, this KRW zone was characterized by a homogenous sediment. Nearly all replicates were dominated by fine to medium sand fractions (125-250 µm), whereas in replicate 4 the silt fraction was dominantly present.

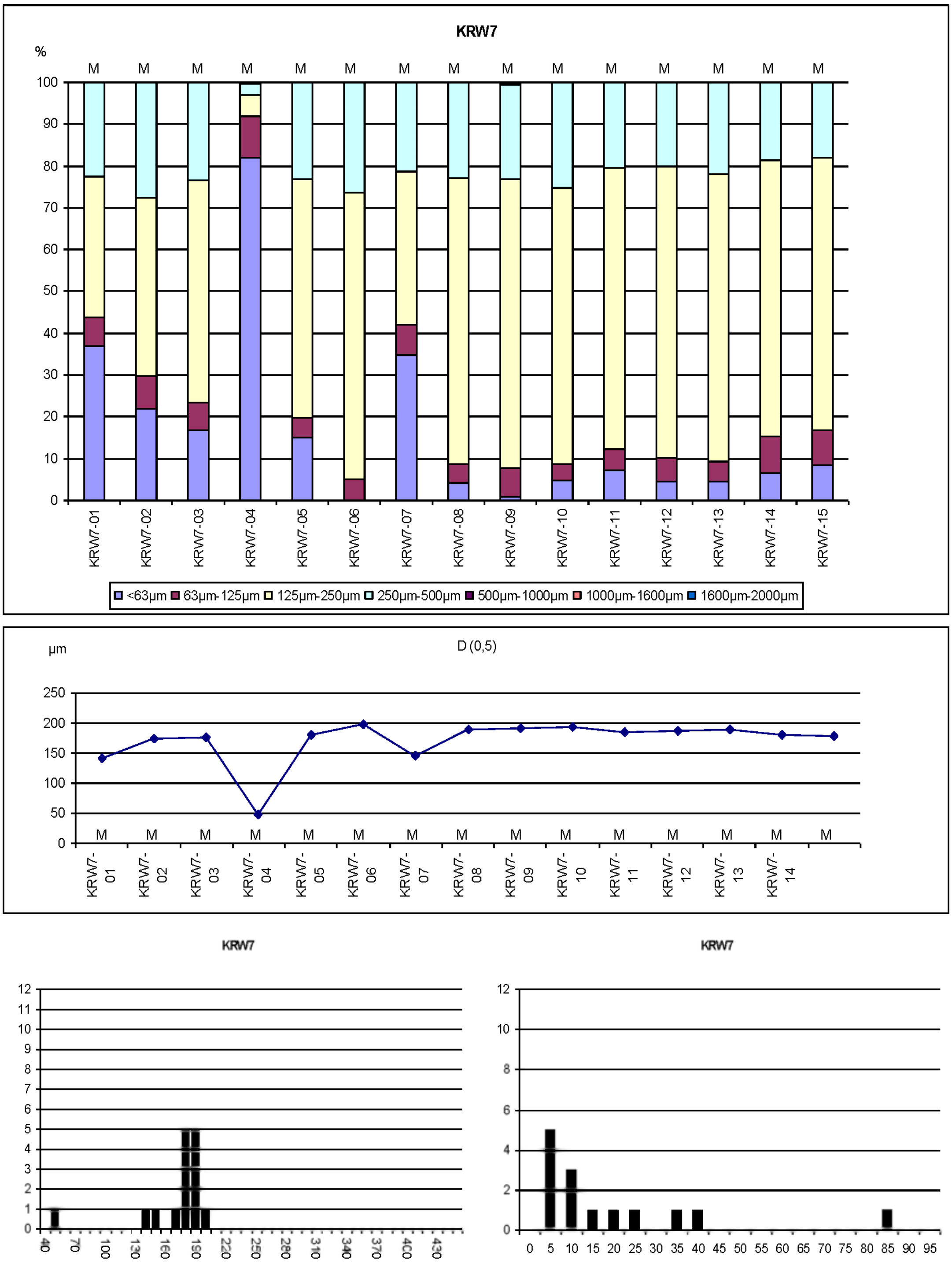
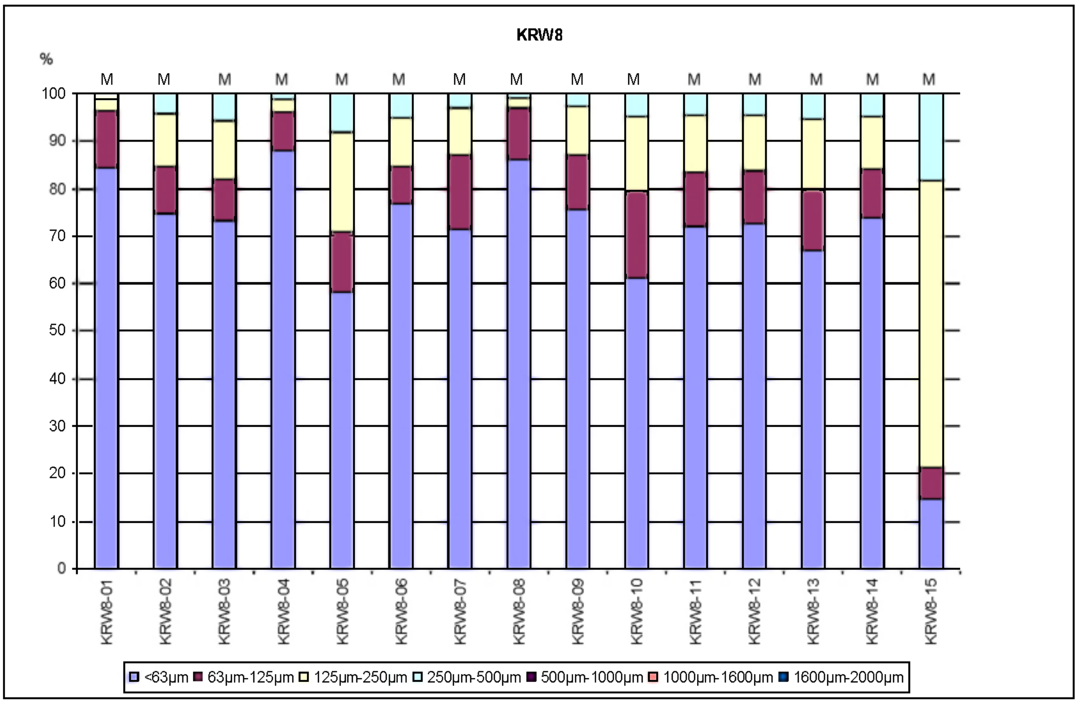
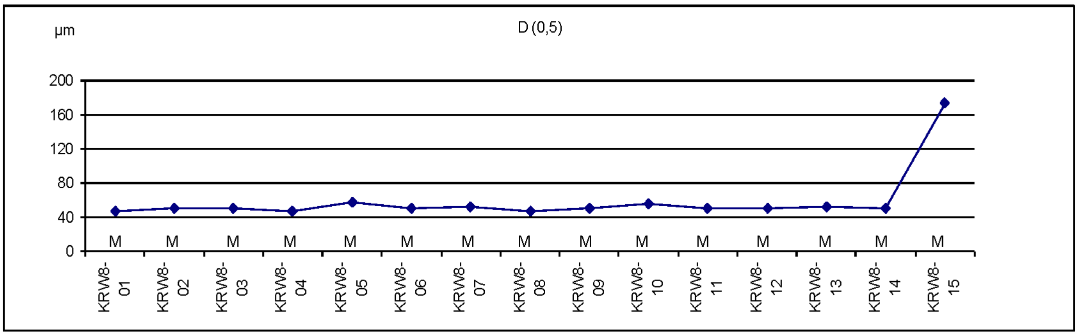


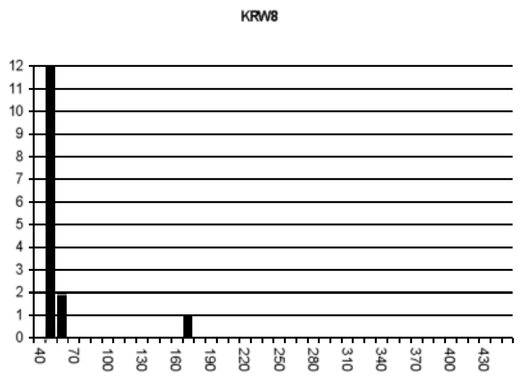
Figure 19. Sediment characteristics of KRW zone 7, showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. M: Macoma balthica habitat*

KRW 8

The medium grain size in KRW zone 8 showed an uniform pattern (Figure 20). In all replicates there was a clear dominance in mud content (average of 70%). The medium grain size varied from 47 to 174 µm with an average of 59 µm. Replicate 15 showed an aberrant sediment composition, with a dominance of fine sand.







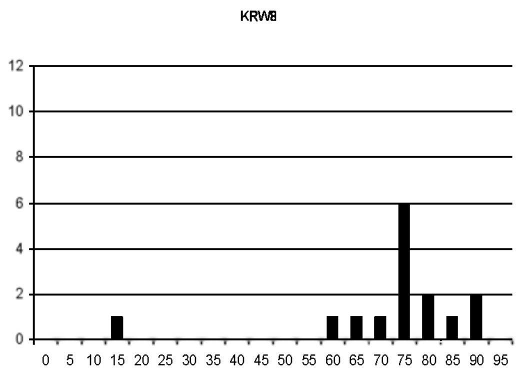


*Figure 20. Sediment characteristics of KRW zone 8, showing per replicate resp. **(from top to bottom)** the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm) **(left)** and the distribution of the silt fraction (< 63 µm) **(right)**. M: Macoma balthica habitat*

KRW 9

KRW zone 9 showed a highly variable sediment composition (Figure 21). No clear patterns could be found. In most replicates there was however a considerable mud content present. In one third of the replicates it was the dominant fraction. In other replicates the amount of coarser fractions became more prominent. The medium grain size varied between 47 and 430 µm with an average of 201 µm.

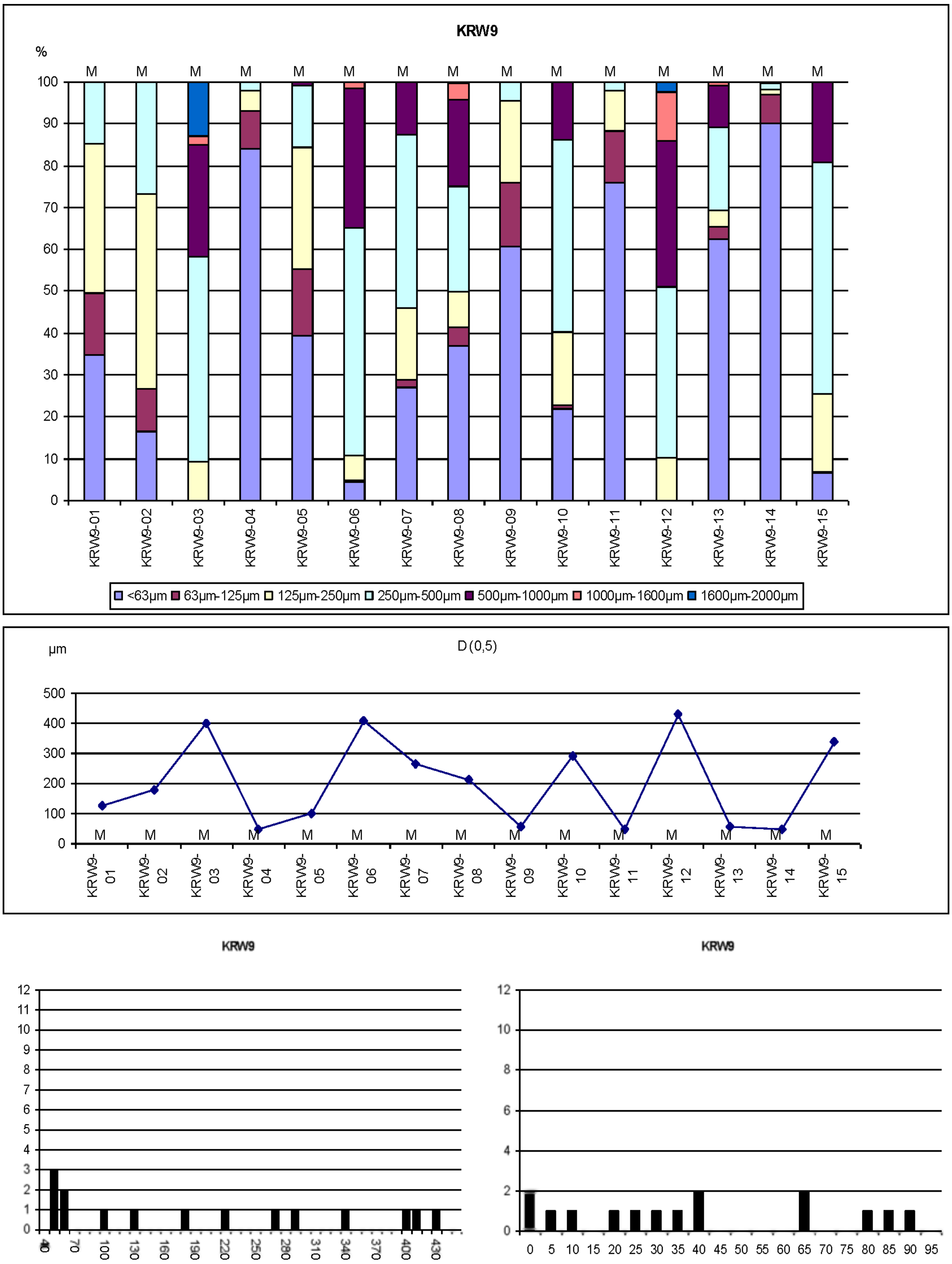


Figure 21. Sediment characteristics of KRW zone 9., showing per replicate resp. ***(from top to bottom)*** *the sediment fractions; the medium grain size; the distribution of the D(0.5) (µm)* ***(left)*** *and the distribution of the silt fraction (< 63 µm)* ***(right)****. M: Macoma balthica habitat*

3.4 Evaluation of the sampling strategy.

The number of assessment samples available per habitat and at the three main zones was summarized in table 3.

Table 3. Number of samples and total sampling surface per habitat per zone. The 5 samples which could not be attributed to a habitat in zone 2 were not counted.

Zone	habitat	# samples	Sampling surface (m^2)
1	Abra alba	9	0.9
	Nephtys cirrosa	14	1.4
	Macoma balthica	21	2.1
2	Abra alba	6	0.6
	Nephtys cirrosa	1	0.1
	Macoma balthica	18	1.8
3	Macoma balthica	60	6.0

For a good assessment with the BEQI approach, enough samples per habitat type are needed to get a representative evaluation. The Belgian coast is divided into three zones: (1) a western zone (French border to Middelkerke); (2) a central zone (Middelkerke to De Haan) and (3) an eastern zone (De Haan to the Scheldt estuary). It is the aim to evaluate the status of the benthos per habitat in these three zones.
→ The selection of the 9 sampling locations leads to a good spatial distribution of the samples, except in the central zone, where it is better to have 4 locations.
→ The three benthic habitats were found in zone 1, whereof enough samples were available for the Nephtys cirrosa and Macoma balthica habitat. More samples needs to be taken in the Abra alba habitat during the next monitoring campaign.
→ The three benthic habitats were also found in zone 2, but doubtful for the Nephtys cirrosa habitat. The spatial variability is high within this area. Therefore, more samples have to be taken in the next monitoring campaign to get sufficient samples for each habitat. It is also opportune to select four locations in the central zone to get a better spatial distribution, which can reflect better the dıfferent habitat types. The focus has to be on the Abra alba and Macoma balthica habitat.
→ At zone 3, only the Macoma balthica habitat was found and therefore the amount of samples taken in this area can be seriously reduced, but by leaving the four sampling locations. This means that a reduction of samples per location is advised.

4. Evaluation of the availability of reference data

4.1 Description of the available benthos data

Four different data sets were available to set reference conditions. They are summarized in table 4 (Belgian data sets) and table 5 (Dutch and French data sets). The two Belgian data sets (UGent (Macrodat) and ILVO) were combined into a single database, while the Dutch and French data were kept as potentially additional reference data.
As the data originated from different projects and time periods, a unified species list was constructed. Subsequently the database was subdivided into three distance-from-the-coast zones (1, 3 and 6 nautical mile) and in four time periods (before 1981, 1981-1990, 1991-2000 and 2001-2006).

Table 4. Available benthic samples of the Belgian coastal waters.

	< 1981	*1981–1990*	*1991–2000*	*2001–2006*
ILVO data				
< 1 **mile**	*3*	*20*	*24*	*10*
1-3 **miles**	*13*	*51*	*50*	*51*
3-6 **miles**	*0*	*0*	*31*	*42*
UGent data (Macrodat)				
< 1 **mile**	*58*	*12*	*286*	*304*
1-3 **miles**	*56*	*43*	*264*	*291*
3-6 **miles**	*22*	*0*	*22*	*21*
Total				
< 1 **mile**	*61*	*32*	*310*	*314*
1-3 **miles**	*69*	*94*	*314*	*342*
3-6 **miles**	*22*	*0*	*53*	*63*
Total available samples	*152*	*126*	*677*	*719*

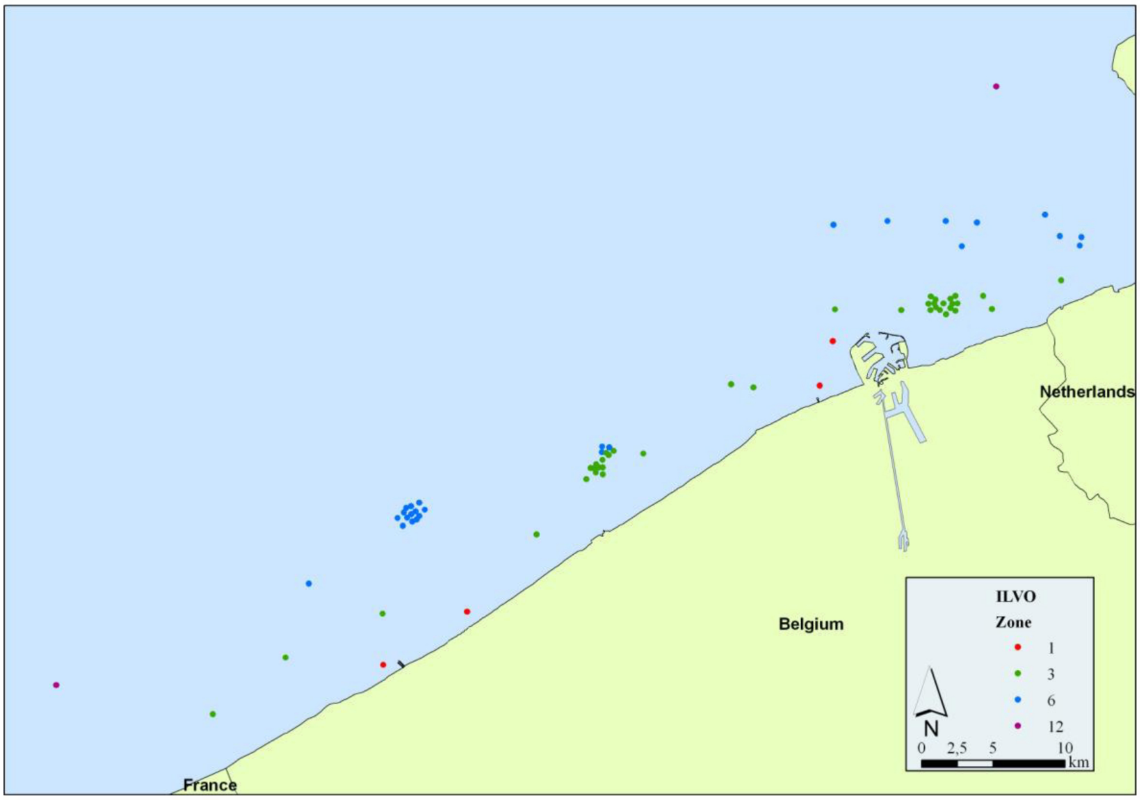


Figure 22. Reference data, available from the ILVO database with indication of the mile zones.

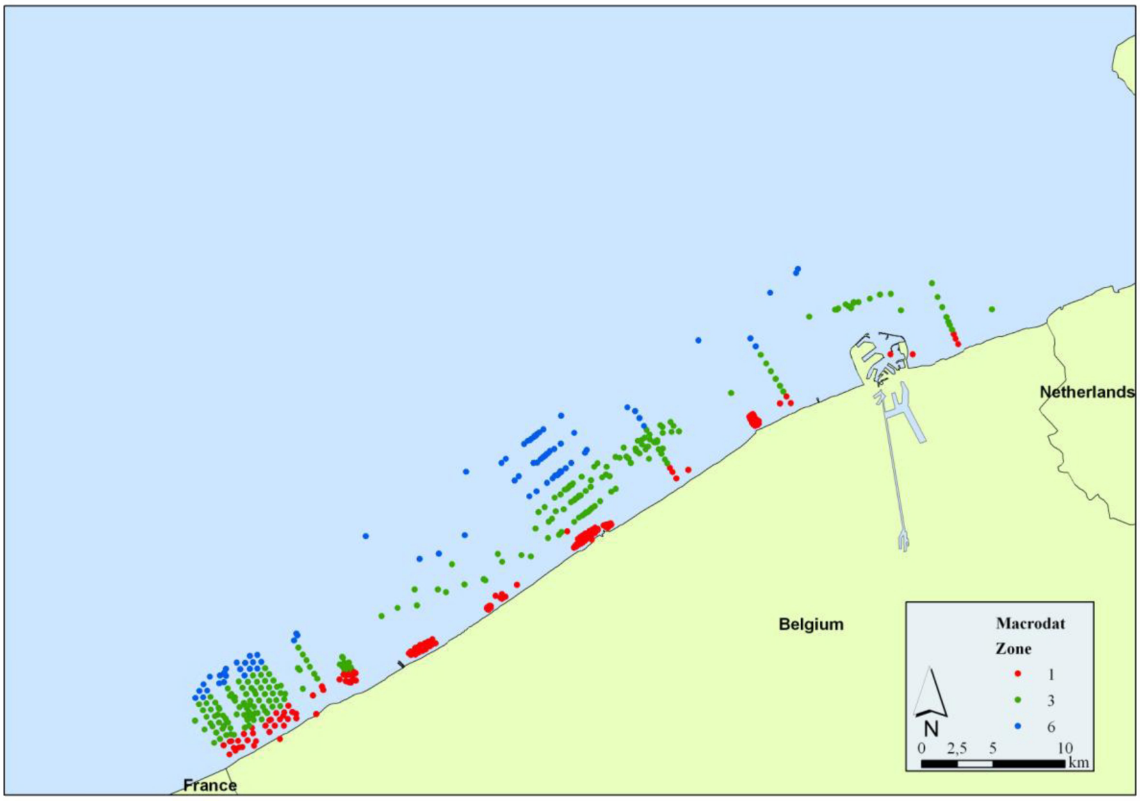


Figure 23. Reference data, available from the Macrodat database (UGent), with indication of the mile zones.

Tabel 5. Available data sets form the 6 miles zone of the Dutch and French coastal waters.

	< 1981	1981-1990	1991-2000	2001-2006
French data				
< *1* mile			*27*	
< *3* miles			*51*	
< *6* miles			*9*	
Dutch data				
< 6 miles		*1479*		

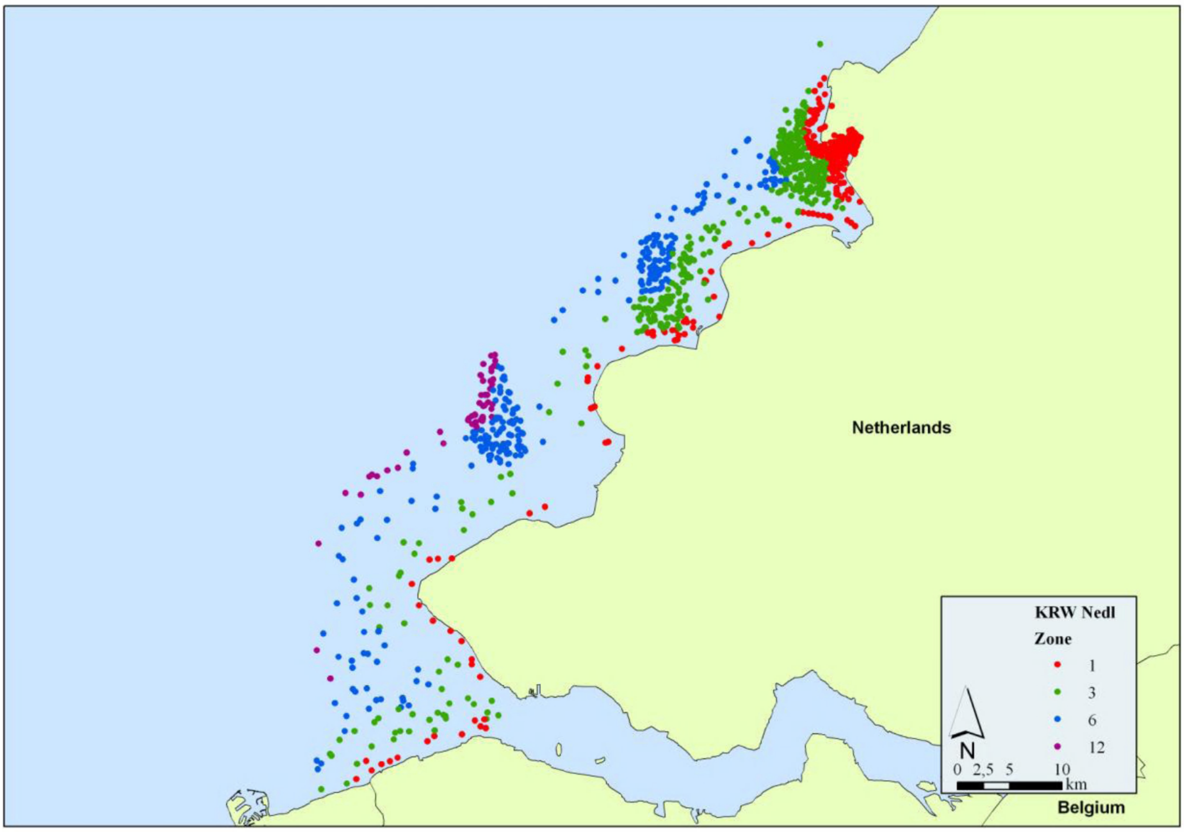


Figure 24. Potential data, available from The Netherlands (Deltaris), with indication of the mile zones

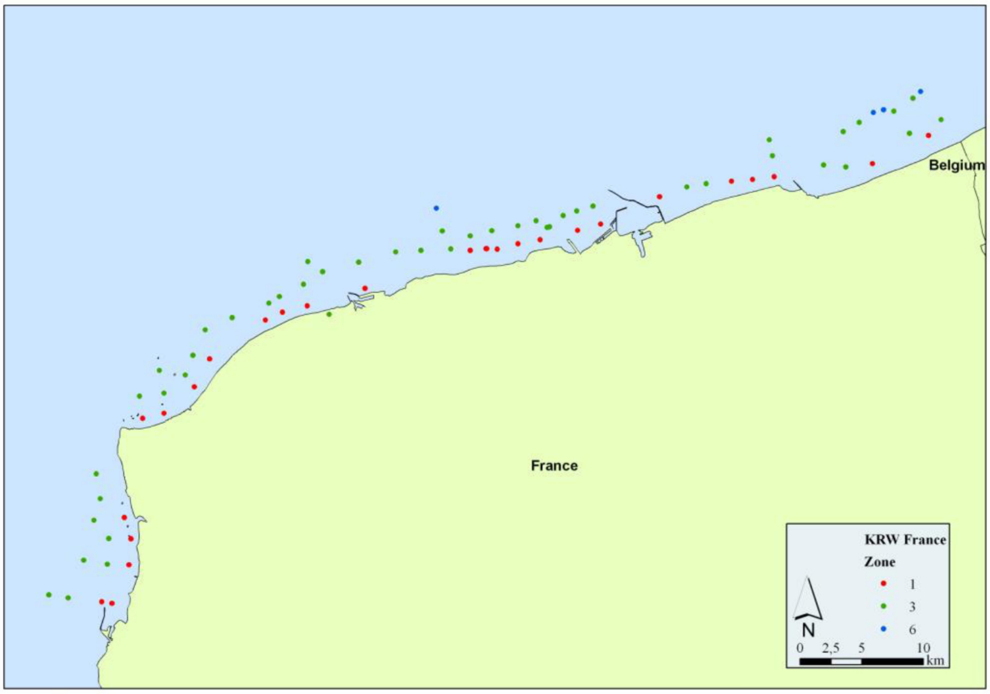


Figure 25. Potential data, available from France (J.C. Dauvin), with indication of the mile zones

4.2 Selection of Belgium reference period/data

It became clear that there is more benthic data available for Belgium, based on the available data gathered in 3.2.1, than used in the first attempt (REFCOAST). Therefore, a more detailed analysis of the number of samples/stations per year, distance from the coast and spatial distribution is done in order to select a reference period that delivers a reference dataset useable for the BEQI.
The BEQI indicator tool assesses the current status against the defined reference condition per habitat per area. The reference conditions are defined based on a reference dataset, which is selected with a pragmatic approach and in such a way that the reference condition/dataset reflects the temporal and spatial variability of the habitat and area. Due to the fact that there are no data about unimpacted areas (non-existent) or time periods for the Belgian coast, the reference data are influenced by the present anthropogenic pressures in the concerned period. This means that the determined reference conditions are no real reference, as meant by data coming of unimpacted areas. However, the BEQI approach aims to evaluate changes in the benthos compared to predefined reference conditions. Therefore, in this section, the best time period and settings of the reference conditions for the Belgian coast, based on the available data, are explained.

4.2.1 Temporal distribution of possible reference samples.

The benthos data gathered for the Belgian coast (< 6 nautical mile) originate from long-term monitoring at fixed stations and grid sampling in the framework of different projects (see 3.2.1). Sampling occurred in different seasons and due to the high seasonal variability in the benthos characteristics, only data from summer-autumn are used in the present analysis. The

main motive for that selection is that the WFD monitoring occurs in the beginning of autumn and therefore the benthic parameters are comparable between assessment and reference.
In table 6, an overview is given of the amount of available samples (single grabs) and stations (unique, without replicas) per year and zone, as reference. The data are split up according to the existing zones because the WFD aims to evaluate the biological parameters 'macro-invertebrates' in the first nautical mile. Hence, the monitoring occurs in this zone. Historically, a low amount of samples were taken in this zone. Consequently, it has been suggested to include samples from more offshore (1-3 mile zone and 3-6 mile zone). Benthic data are available from 1976 onwards and an evaluation of the amount of samples is made per decade.

Table 6: Overview of the amount of samples and stations per year and per mile zone.

SAMPLES				
year	< 1 mile	1-3 mile	3-6 mile	TOTAL
1976	3	2	2	7
1977	42	25	8	75
1978	5	7	6	18
1979	9	9	3	21
1980	4	9		13
1981	3	6		9
1982		6		6
1983	6	19		25
1984	3	8		11
1985	6	15		21
1986	6	3		9
1987	3	3		6
1988	3	6		9
1989	3	6		9
1990	3	6		9
1991	1	2		3
1993	3	3		6
1994	23	23	2	48
1995	28	26		54
1996	8	11		19
1997	31	32	5	68
1998	3	6	3	12
1999	67	63	6	136
2000	25	40	9	74
2001	3	6	8	17
2002	56	74	20	150
2003	3	18	6	27
2004	3	19	15	37
2005	3	22	15	40
2006	148	73	64	285
period	< 1 mile	1-3 mile	3-6 mile	TOTAL
<1981	63	52	19	134
1981-1990	36	78	0	114
1991-2000	189	206	25	420
2001-2006	216	212	128	556

STATIONS				
year	< 1 mile	1-3 mile	3-6 mile	TOTAL
1976	3	2	2	7
1977	14	7	2	23
1978	2	3	2	7
1979	3	3	1	7
1980	2	4		6
1981	1	2		3
1982		3		3
1983	1	5		6
1984	1	4		5
1985	2	5		7
1986	2	1		3
1987	1	1		2
1988	1	2		3
1989	1	2		3
1990	1	2		3
1991	1	2		3
1993	1	1		2
1994	21	19	2	42
1995	2	3		5
1996	2	3		5
1997	21	18	3	42
1998	1	2	1	4
1999	51	58	6	115
2000	23	36	9	68
2001	1	2	4	7
2002	54	33	5	92
2003	1	3	2	6
2004	1	6	5	12
2005	1	8	5	14
2006	146	67	60	273
period	< 1 mile	1-3 mile	3-6 mile	TOTAL
<1980	24	19	7	50
1980-1990	11	27	0	38
1990-2000	123	142	21	286
2000-2006	204	119	81	404

Based on the information gathered in table 6, it became clear that the sampling intensity increased in time and that before 1994 mostly fixed stations were sampled (except in 1977). In recent years, more campaigns with a more spatial distribution were included. The incorporation of the data from the 1-3 mile and 3-6 mile zone is advisable to increase the availability of benthic data.

4.2.2 Spatial distribution of possible reference samples

The spatial distribution of the stations in the different decades were visualised in figure 26. The lowest spatial distribution was found in the 80's, followed by the 70's. In the 90's there was a very good spatial distribution of the samples along the west coast, but almost none at the east coast. From 2000 onwards, there was a wider spatial distribution of the samples along the entire Belgian coast, but with a focus on the central part and the East coast. Most of those samples were taken in 2006, which is very recent.

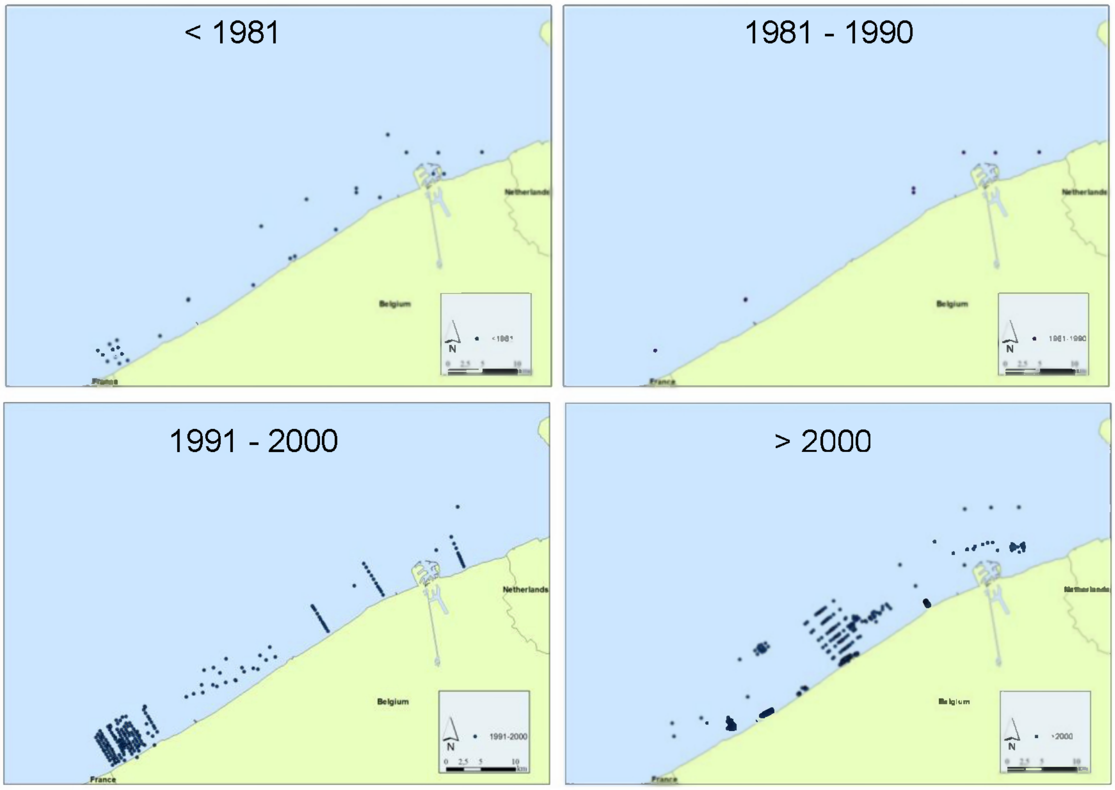


Figure 26. Spatial distribution of the reference stations in the different decades. X-axis: latitude; Y-as: longitude (WGS84)

4.2.3 Selection of reference period

Based on the amount of samples and their temporal and spatial distribution, the following conclusions can be made about the most suitable reference period:

→ *Benthic data from before 1994 have a very good temporal distribution, but almost no spatial distribution, except for data of 1977 at the West coast. During this period, a shift in the benthos characteristics was detected at the stations located nearby the harbour of Zeebrugge, due to the construction works at the harbour at that time. For these reasons, the data of this period are not ideal as reference.*

→ *Recent years are not suitable as reference either, because comparing a present-day situation with a present-day reference will lead to a high comparability. This means that the high amount of data gathered in 2006 is too recent to use it as reference, but the high amount of data within the 1 mile can be used for assessment.*

→ *The ideal period to select as reference seems to be 1994 – 2004, with a 10 year temporal coverage and a very good spatial distribution along the Belgian coast (Figure 27). This* *reference period is still affected by anthropogenic disturbance (fishery, eutrophication), but this reference will be used to detect efficiently further deterioration. Further impact studies and modelling has to be used to investigated if this reference reflect a good status.*

Figure 27. The spatial distribution of the samples in the reference period 1994- 2004.

4.3 Benthic community structure within reference data

The dataset with benthos data from the period 1994 – 2004 within the 6 mile zone was selected as best option for using as reference period for the benthic communities along the Belgian coast. For evaluation of the ecological status of the benthos with the BEQI approach, it is important to define the different habitats. This is done based on a cluster analysis and multidimensional scaling to visualise the different benthic communities along the Belgian coast. The analyses are based on a fourth root transformed dataset.

The samples recording a high Spisula subtruncata spatfall (> 100.000 ind/m²) were excluded, because these high values influence the reference parameters too strongly. Samples taken within an impacted area (dumping site, LOO, LZO) and one extreme outlier from the preliminary analysis were also excluded.

The cluster analysis (Figure 29) showed 5 main clusters (at 20% similarity level) and some outliers (group 0) (Figure 28). The main clusters 2, 3 and 4 can be split up in some sub-clusters to get more detail on the benthic patterns within the reference period. The cluster grouping was not based on a temporal pattern and no deviation between samples originating from UGent and ILVO was found. A SIMPER analysis was performed to characterise the dominant species of each cluster (Table 8). The distribution of some of these dominant species were visualised in the MDS plot of the reference data in figure 30. These results were compared with the community analysis performed on the Belgian Continental Shelf (Van Hoey et al., 2004, Degraer et al., 2006) by linking these cluster to the defined macrobenthic communities.

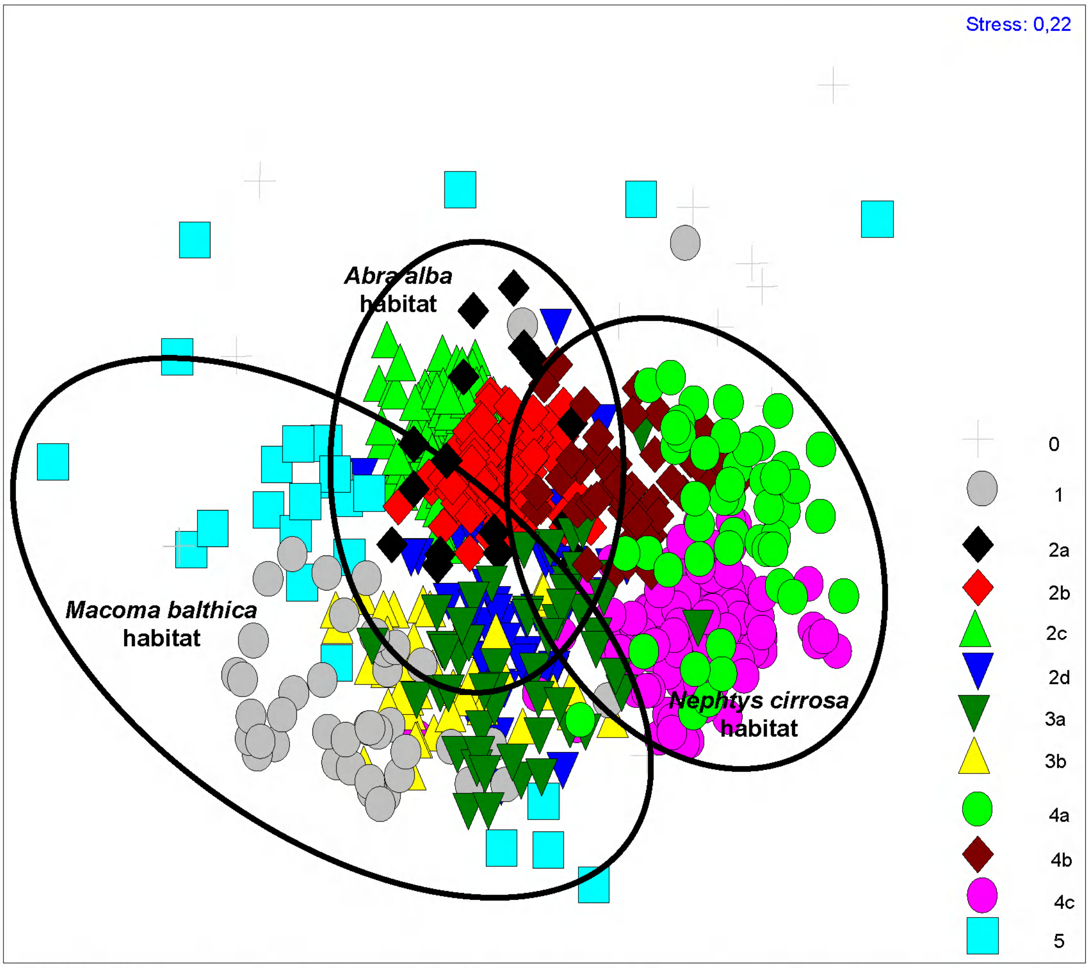


Figure 28. MDS plot with visualisation of the different cluster groups in the benthos dataset 1994-2004.

Following conclusions could be made per cluster:

- *Cluster 0: Outliers of the multivariate analysis not included in the reference.*
- *Cluster 2: characterised by Magelona johnstoni, Spisula subtruncata, Lanice conchilega and Abra alba. This cluster showed high densities and numbers of species and corresponds with the Abra alba community. Several sub-clusters can be distinguished:*
    - *Cluster 2a: concerning species composition very similar to cluster 2c, but the species showed lower densities.*
    - *Cluster 2b: characterised by Magelona johnstoni and Spisula subtruncata. The species composition was slightly different when those species dominated, compared to the Abra alba community sensu strictu.*
    - *Cluster 2c: contained the most diverse species composition and can be identified as the Abra alba community sensu strictu.*
    - *Cluster 2d: characterised by typical species of the Abra alba community but in much lower densities.*
- *Cluster 3: characterised by Nephtys hombergii, Cirratulidae spp. and Macoma balthica and showing a low diversity and low average densities.*
    - *Cluster 3a and Cluster 3b showed similar characteristics and therefore it seemed better to group them.*
- *Cluster 4: characterised by Nephtys cirrosa, Magelona johnstoni, Scoloplos armiger, Bathyporeia sp. and Urothoe brevicornis. The diversity was low and the average densities*

were very low. It seems that this cluster shows most affinity with the Nephtys cirrosa community. Within this cluster, subgroups can be identified:

- *Cluster 4a: characterised by low densities of Nephtys cirrosa, Urothoe brevicornis and Ophelia limacina. These species prefer coarse sandy substrates. This species assemblage resembled the transitional species assemblages between the Nephtys cirrosa community and the Ophelia limacine – Glycera lapidum community. This species assemblage groups the samples coming from the coarse sandy substrates along the Belgian coast (< 6 mile).*
- *Cluster 4b: characterised by Nephtys cirrosa, Spiophanes bombyx, Magelona johnstoni and Echinocardium cordatum. It showed higher diversity and average density compared to the other sub-clusters. This species assemblage corresponds with the Nephtys cirrosa community.*
- *Cluster 4c: characterised by Nephtys cirrosa, Magelona johnstoni and Bathyporeia species but in much lower densities. This species assemblage also corresponds with the Nephtys cirrosa community.*

- *Cluster 5: characterised by Polydora spp., Petricola pholadıformes and Barnea candida. These species prefer more muddy substrates. This species assemblage shows affinity with the Macoma balthica community.*

Table 7. Number of species, average density per cluster/sub-cluster

main cluster	Average # species	Stdev # species	Total # species	Average density	Stdev density	Total # samples	Total Sampling surface
1	5	3	45	299	330	43	4.34
2	24	10	156	6337	8663	278	28.55
3	8	3	75	640	1355	97	9.89
4	8	4	92	339	383	186	19.49
5	10	6	59	2178	2548	25	2.53
sub clusters	Average # species	Stdev # species	Total # species	Average density	Stdev density	Total # samples	Total Sampling surface
1	5	3	45	299	330	43	4.34
2a	18	4	71	2076	2386	16	1.68
2b	23	6	101	9110	11632	119	12.41
2c	32	8	142	6007	4783	98	9.96
2d	10	3	57	1241	1727	45	4.51
3a	8	3	55	499	1060	53	5.41
3b	8	3	50	811	1638	44	4.48
4a	7	3	59	290	276	48	5.06
4b	13	4	75	642	555	49	5.11
4c	5	2	52	198	168	89	9.32
5	10	6	59	2178	2548	25	2.53

Based on these results, the following suggestion can be made about which cluster can be used as reference for the 3 main habitats of the Belgian Coast (< 1 nautical mile): (1) Abra alba community; (2) Macoma balthica community, (3) Nephtys cirrosa community.

1) *Abra alba community: Cluster 2; 278 samples with 28.55 m² as sampling surface*
2) *Macoma balthica community: cluster 1, 3, 5; 165 samples with 16.76 m² as sampling surface*
3) *Nephtys cirrosa community: cluster 4; 186 samples with 19.49 m² as sampling surface*

These were the three habitat types that were found in the Belgian coastal zone, each containing samples typical for the community sensu strictu, but also samples that form the transition to other habitat types. In such way, the temporal and spatial variability within a certain habitat is covered by the selected reference data.

Table 8. SIMPER analyses showing the most contributing species to each cluster group and its average density (ind/m²) in this group.

Group 1		
Species	AV. Abund	AV. Sim
Cirratulidae	161.69	15.61
Nephtys	9.7	1.42
OLIGOCHAETA	45.81	0.72

Group 2a		
Species	AV. Abund	AV. Sim
Abra alba	955.57	3.21
Scoloplos armiger	36.94	1.98
Spiophanes bombyx	38.08	1.2
Spisula subtruncata	93.55	1.17
Lanice conchilega	134.15	0.99
Mysella bidentata	52.1	0.78
Cirratulidae	134.38	0.55
Nephtys hombergii	30.19	0.41
Nephtys cirrosa	24.63	0.39
Notomastus latericeus	13.38	0.35
Eumida	77.81	0.35
Magelona johnstoni	65.48	0.29
Pariambus typicus	50.19	0.28
Spisula	9.14	0.27
Capitella	29.17	0.21
Phyllodoce	14.42	0.16
Ensis	13.57	0.16
Eunereis longissima	13.62	0.15
ACTINIARIA	9.3	0.14
Venerupis senegalensis	13.32	0.12
Abludomelita obtusata	10.5	0.12

Group 2b		
Species	AV. Abund	AV. Sim
Magelona johnstoni	777.99	8.04
Spisula subtruncata	6159.74	6.24
Tellina fabula	236.45	3.27
Lanice conchilega	359.38	2.26
Nephtys hombergii	101.88	1.45
Spio	165.68	1.13
Spiophanes bombyx	134.95	0.67
Abra alba	67.78	0.58
Eumida	148.2	0.51
Capitella	177.7	0.4

Group 2c		
Species	AV. Abund	AV. Sim
Abra alba	673.03	4.92
Cirratulidae	252.51	2.39
Pariambus typicus	450.72	1.69
Mysella bidentata	481.99	1.66
Spiophanes bombyx	357.84	1.45
Lanice conchilega	569.72	1.41
OLIGOCHAETA	275.8	1.32
Scoloplos armiger	306.42	1.32
Notomastus latericeus	160.91	1.3
Eumida	388.89	1.16
Capitella	130.16	0.77
Tellina fabula	184.1	0.73
Magelona johnstoni	194.82	0.59
ACTINIARIA	90.57	0.56
Heteromastus filiformis	246.87	0.49
Phyllodoce mac/muc	98.04	0.35
Abludomelita obtusata	60.93	0.33
Nephtys hombergii	43.62	0.29
Pectinaria koreni	62.17	0.26
Venerupis senegalensis	65.25	0.26
Glycera alba	28.97	0.25

Group 2d		
Species	AV. Abund	AV. Sim
Spisula subtruncata	959.99	13.36
Nephtys hombergii	36.38	3.46
Nephtys	25.32	2.18
Spio	24.89	2.03
Lanice conchilega	33.98	0.65
Spiophanes bombyx	26.08	0.6

Group 3a		
Species	AV. Abund	AV. Sim
Nephtys hombergii	45.72	9.52
Nephtys	26.76	3.34
Donax vitatus	28.54	3.11
Magelona johnstoni	39.43	1.8
Macoma balthica	12.72	1.65
Nephtys cirrosa	23.24	1
Spiophanes bombyx	14.85	0.52
Cirratulidae	17.13	0.51

Group 3b		
Species	AV. Abund	AV. Sim
Cirratulidae	534.44	13.82
Nephtys hombergii	30.84	3.8
Abra alba	40.57	1.97
Macoma balthica	25.48	1.89
Nephtys	31.48	0.89

Group 4a		
Species	AV. Abund	AV. Sim
Nephtys cirrosa	53.8	15.19
Urothoe brevicornis	42.06	3.42
Scoloplos armiger	22.44	3.24
Ophelia limacina	23.09	2.27
Mytilus edulis	30.4	0.96

Group 4b		
Species	AV. Abund	AV. Sim
Nephtys cirrosa	114.42	16.95
Spiophanes bombyx	112.92	4.18
Magelona johnstoni	136.71	1.71
Echinocardium cordatum	13.07	1.33
Scoloplos armiger	17.25	1.27
Tellina fabula	22.32	0.99
Urothoe poseidonis	27.22	0.72
Tellimya ferruginosa	12.53	0.6
Spisula subtruncata	5.14	0.35

Group 4c		
Species	AV. Abund	AV. Sim
Nephtys cirrosa	59.95	20.07
Magelona johnstoni	37.17	3.09
Bathyporeia	30.88	1.66
Nephtys	7.61	0.76

Group 5		
Species	AV. Abund	AV. Sim
Polydora	705.29	5.54
Petricola pholadiformis	312.87	3.59
Barnea candida	445.47	3.16
Abra alba	346.74	0.35
Mysella bidentata	64.37	0.24
Phyllodoce mac/muc	24	0.21

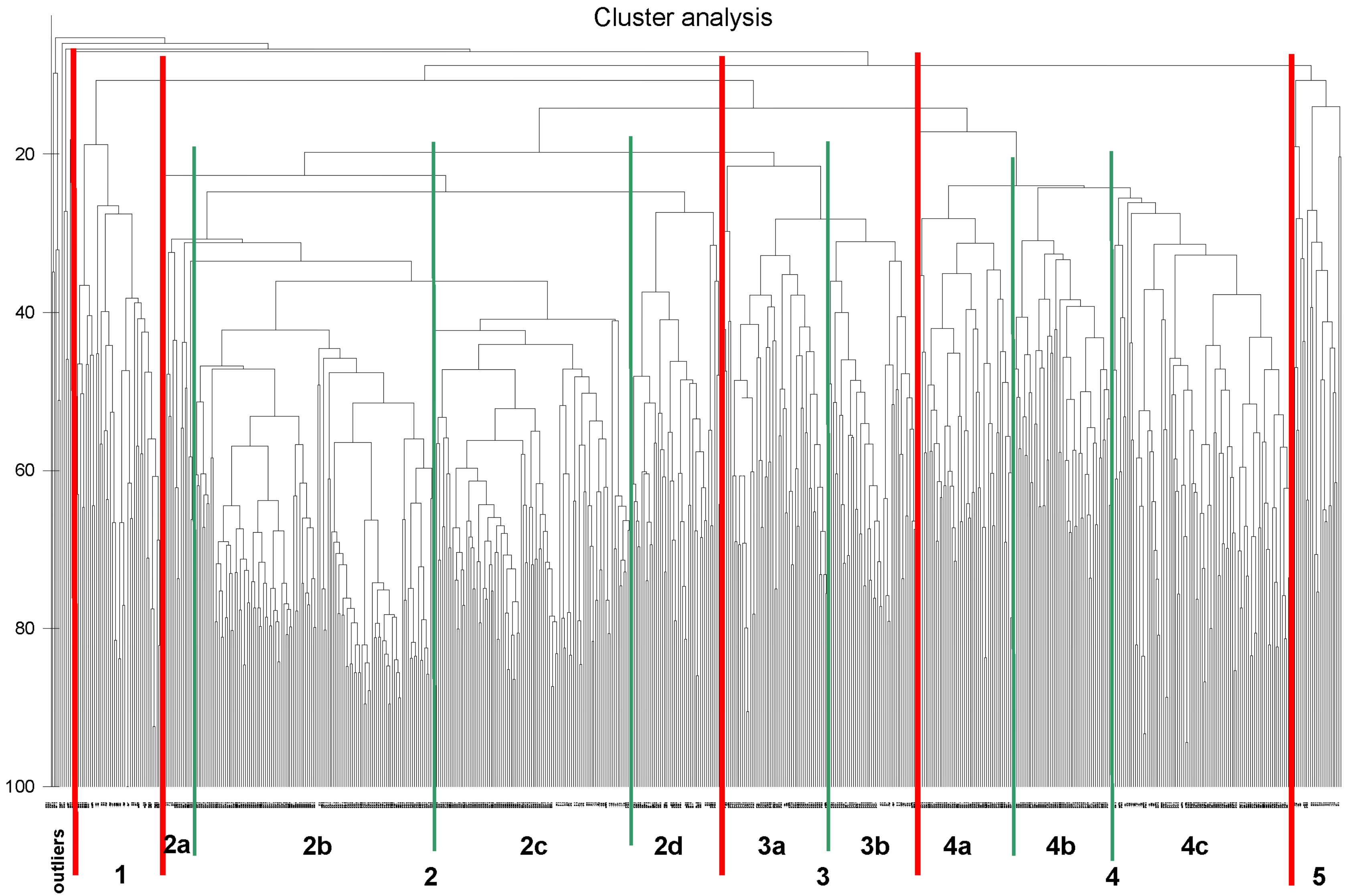


Figure 29. Plot of the cluster analysis with indication of the main clusters and sub-clusters.

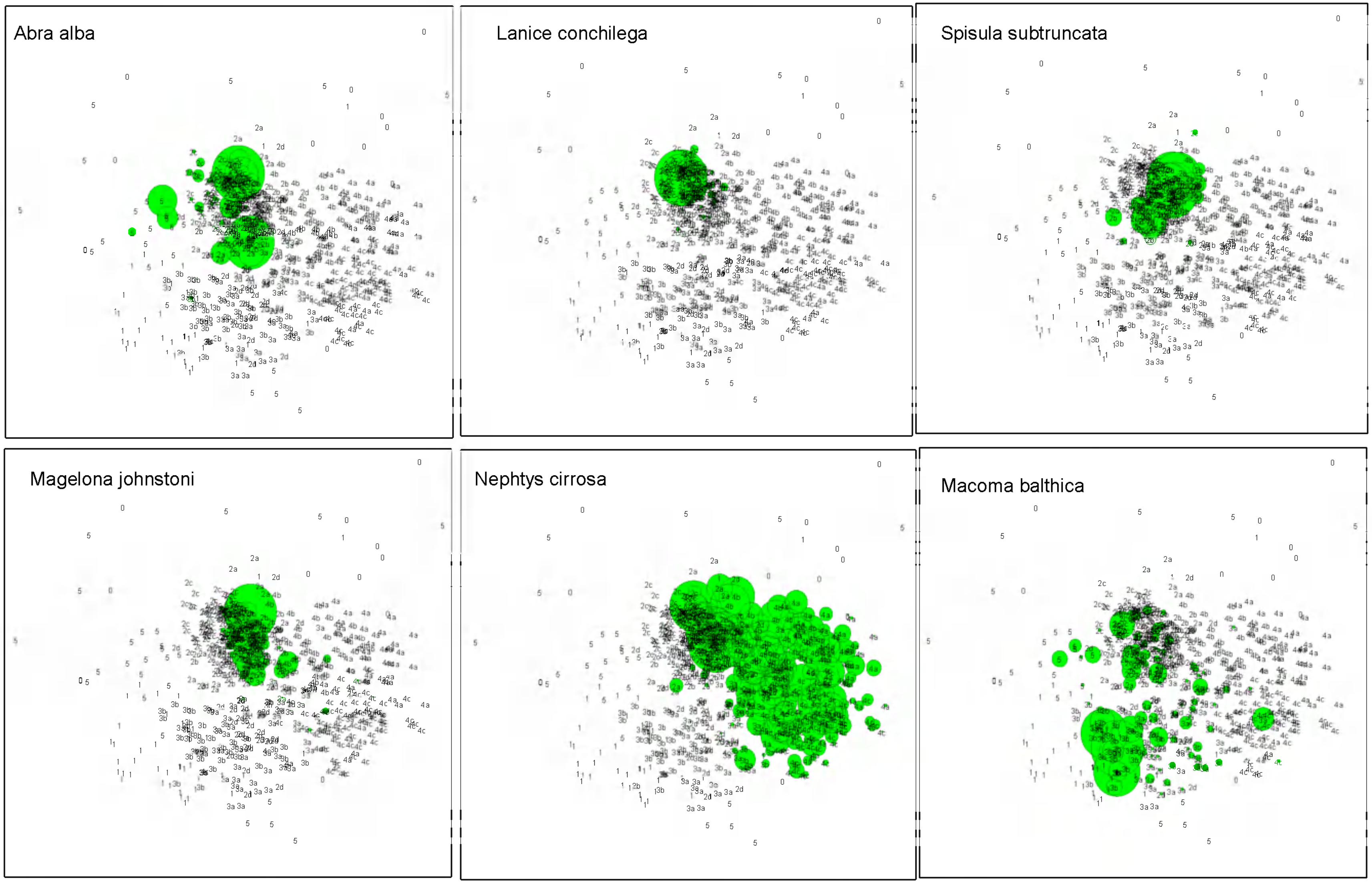


Figure 30. MDS bubble plots of the distribution of the dominant species within the MDS of the reference dataset

4.4 Reference values determined based on the available reference data per benthic habitat.

There can be concluded, based on the analysis in section 4.3, that there is enough reference data available per habitat. Of the four benthic parameters included into the BEQI-tool, only biomass can not be used due to the lack of biomass values for most of the data.
All the available benthic samples per habitat (community) are used to calculate the reference value per WFD boundary by the randomisation program of the BEQI (Van Hoey et al., 2007a).

In figures 31, 32 and 33 a visualisation is given of the reference boundary values distribution in relation to sampling surface, within each habitat. Most species can be found in the Abra alba habitat (135), whereas the maximal number of species for the other two habitats is much lower (± 90). Also the median of the reference density is much higher in the Abra alba habitat (6246 ind/m²), compared to the others (Macoma balthica habitat: 771 ind/m², and Nephtys cirrosa habitat: 339 ind/m²). The parameter similarity increased much faster with increasing sampling surface than the two other habitats, which is an indication of more homogeneity in the Abra alba habitat. The detailed values per boundary were included in the appendix.
The previously defined reference values for the Abra alba habitat in Van Hoey et al. (2007b) and written down in the technical report of the WFD intercalibration have to be updated with these values. This because a better reference dataset with a good temporal and spatial coverage is now defined. The reference boundary values defined in this report were higher compared to those in Van Hoey et al. (2007b) for the same sampling surface.

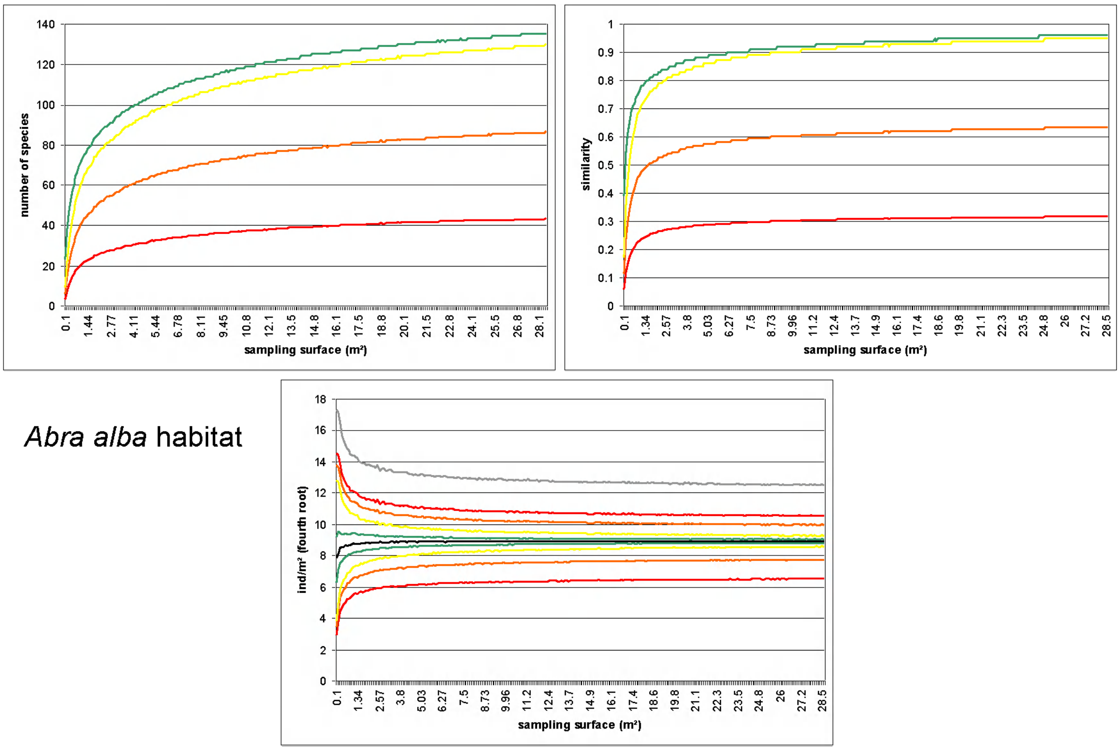


Figure 31. The distribution of the reference boundary values for number of species, similarity and density within the Abra alba habitat. Red: poor-bad boundary; orange: moderate-poor boundary; yellow: good-moderate boundary; green: high-good boundary; black: median; grey: Ref value for EQR of 0.

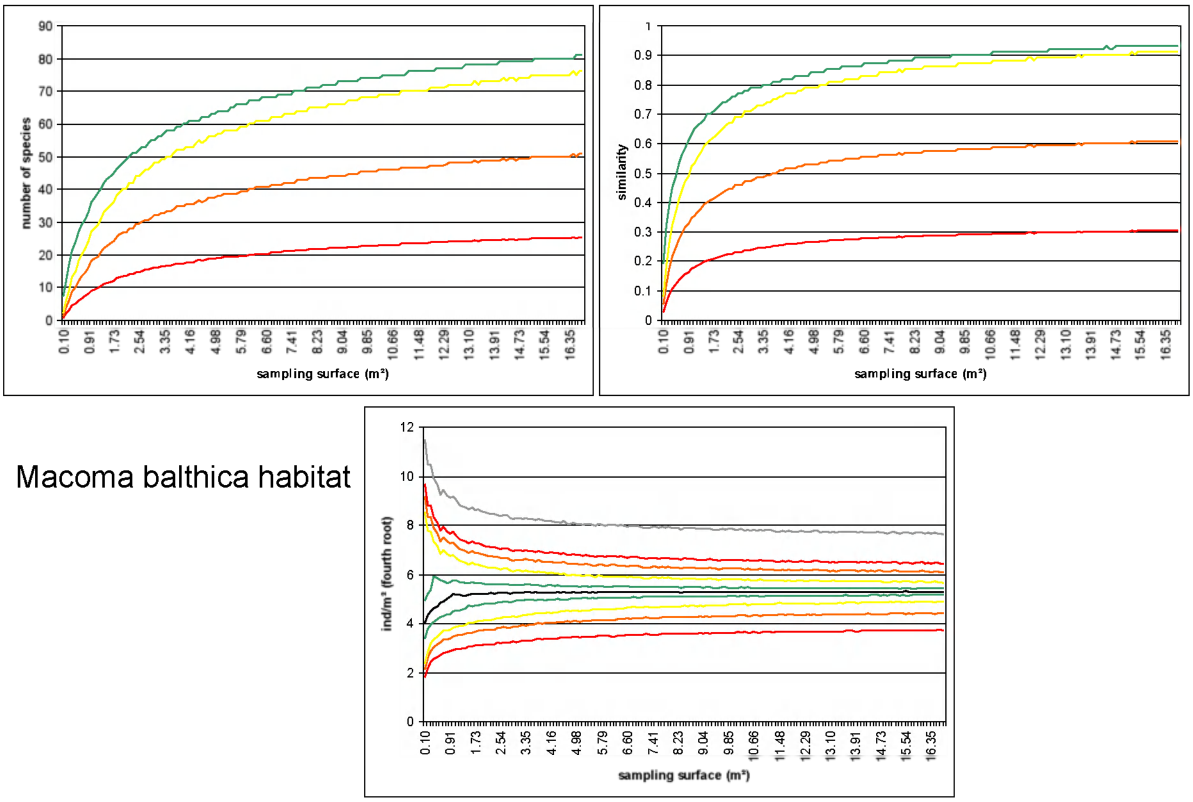


Figure 32. The distribution of the reference boundary values for number of species, similarity and density within the Macoma balthica habitat. Red: poor-bad boundary; orange: moderate-poor boundary; yellow: good-moderate boundary; green: high-good boundary; black: median; grey: Ref value for EQR of 0.

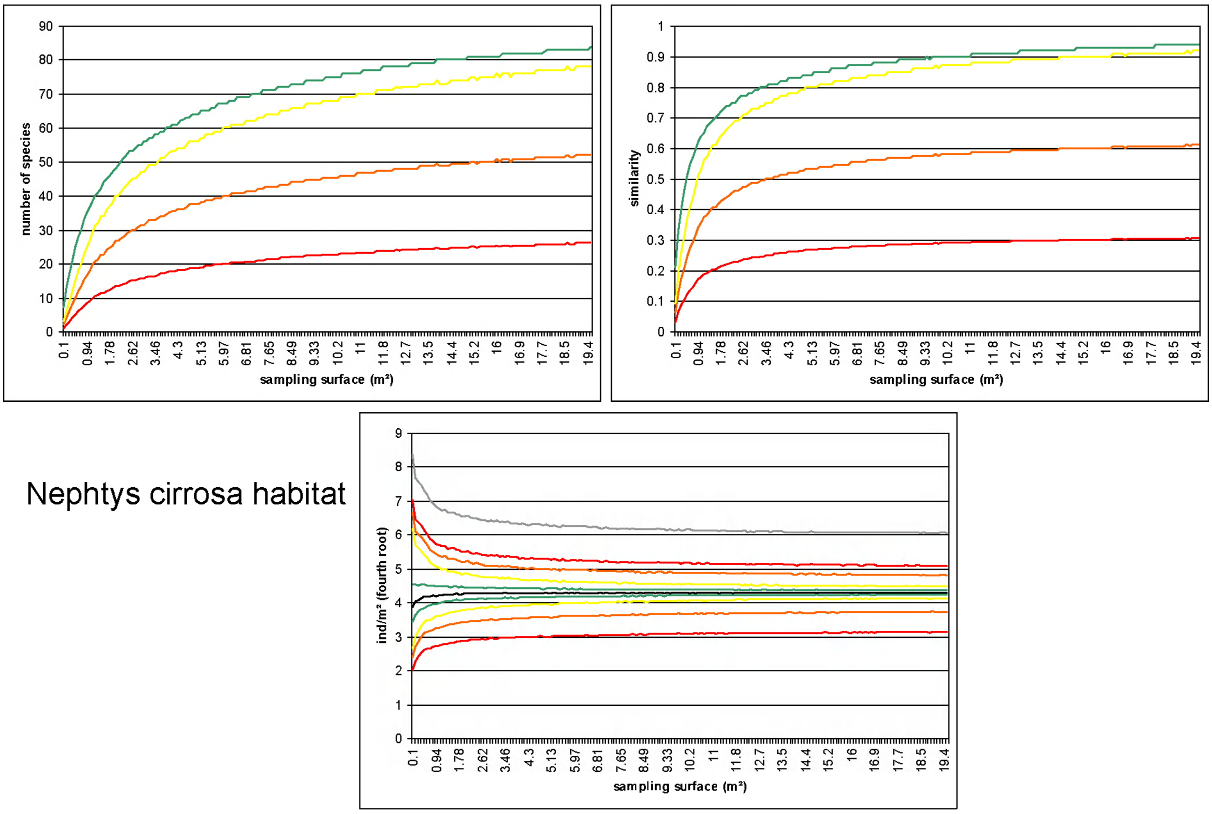


Figure 33. The distribution of the reference boundary values for number of species, similarity and density within the Nephtys cirrosa habitat. Red: poor-bad boundary; orange: moderate-poor boundary; yellow: good-moderate boundary; green: high-good boundary; black: median; grey: Ref value for EQR of 0.

The output of the randomisation of the reference data gives an idea on the minimal sampling surface needed to get a representative assessment (assessment precision). How higher the variability of the reference boundaries, how lower the assessment precision will be. Therefore it is opportune to give values for sampling surfaces that give a good assessment precision. In Van Hoey et al. (2007a), this is done on a pragmatic, subjective way and the approach for this analysis is as follows. For every parameter, the range of values that will give rise to the classification 'good' or better, will decrease with increasing sample surface (see figure 31, 32 and 33). The reason for the narrowing down of the range is that with increasing assessment sample surface, it is easier to detect a significant deviation from the reference. The procedure for determining the precision is the same as in Van Hoey et al. (2007a) and details were given in appendix 6.4 and summarized in table 9.
For the monitoring program of 2007, a total sampling surface of 1.5 m² per habitat was found OK, based on the Dutch coastal information. This is refined for the 3 habitats along the Belgian coast, based on the randomisation outputs. Based on this information, the following advices can be given:

- *In the Abra alba habitat a minimal sampling surface of 1.5 m² is needed to get a representative assessment, but it is better to have 2 m².*
- *In the Macoma balthica habitat a minimal sampling surface of 1.2 m² is needed to get a representative assessment, but it is better to have 1.8 m².*
- *For the Nephtys cirrosa habitat, the same sampling surfaces as the Macoma balthica habitat were needed*
- *When the assessment of the ecological status of the Belgian coast will be done over a 3 year cycle, which is asked by the WFD, it is better to seek to the optimal sampling surface.*

That for the Abra alba habitat, a higher sampling surface is needed, is mainly caused by the higher number of species which could be found in this habitat compared to the others.
The reference boundary values for these sampling surfaces were summarized in table 10.

Table 9. The sampling surfaces needed to reach a good assessment precision per habitat type

	Sampling surface (m²)		
Habitat	minimum	OK	optimal
Abra alba habitat	1.5	2	6
Macoma balthica habitat	1.2	1.8	5
Nephtys cirrosa habitat	1.2	1.8	4.9

Table 10.

		sampling surface minimum				sampling surface OK				
Habitat	Parameter	poor	moderate	good	high	poor	moderate	good	high	
Abra alba habitat	Density (ind/m²)	1043	2087	3130	4678	1147	2295	3443	4908	min
		18758	15006	11255	7545	17829	14263	10698	7384	max
	Number of species	23	46	69	79	25	51	76	85	
	Similarity	0.25	0.5	0.75	0.8	0.26	0.52	0.78	0.82	
Macoma balthica habitat	Density (ind/m²)	76	151	227	421	93	187	280	496	min
		3012	2409	1807	1041	2761	2209	1657	998	max
	Number of species	10	19	29	39	13	25	38	46	
	Similarity	0.18	0.37	0.55	0.66	0.21	0.42	0.63	0.72	
Nephtys cirrosa habitat	Density (ind/m²)	60	120	179	264	68	136	204	272	min
		1033	827	620	403	907	726	544	396	max
	Number of species	10	21	31	40	13	25	38	47	
	Similarity	0.19	0.38	0.57	0.67	0.22	0.43	0.65	0.73	

5. References

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6. Appendix

6.1 Assessment data

The WFD monitoring data (density, biomass and sedimentology) of the Belgian coast of 2007 is delivered to the BMDC databank (BMM) on 26/06/2008. Besides, a copy is given on CD-rom to the Federal Public Service Health, Food Chain Safety and Environment, Directorate General Environment, Marine Environment Service.

6.2 Species list reference data

Abra alba habitat		
Abludomelita obtusata	*Eunereis longissima*	*Owenia fusiformis*
Abra alba	*Euspira pulchella*	*Pagurus bernhardus*
ACTINIARIA	*Gammarus*	*Paraonis fulgens*
Aequipecten opercularis	*Gastrosaccus spinifer*	*Pariambus typicus*
Ampelisca	*Gattyana cirrosa*	*Pectinaria koreni*
Ampharete	*Glycera*	*Perioculodes longimanus*
Amphilochus	*Glycera alba*	*Petricola pholadiformis*
Amphiura	*Glycera lapidum*	*Phaxas pellucidus*
Anapagurus hyndmanii	*Glycera rouxi*	*Pholoe*
Aonides oxycephala	*Goniada maculata*	*Phtisica marina*
Aonides paucibranchiata	*Harmothoe*	*Phyllodoce*
Aora	*Harmothoe glabra*	*Phyllodoce groenlandica*
Arenicola marina	*Harmothoe impar*	*Phyllodoce mac/muc*
Asterias rubens	*Heteromastus filiformis*	*Phyllodoce rosea*
Atylus falcatus	*Idotea*	*Pisidia longicornis*
Atylus swammerdami	*Iphinoe*	*Podarkeopsis helgolandica*
Atylus vedlomensis	*Lanice conchilega*	*Poecilochaetus serpens*
Autolytus	*Leucothoe*	*Polycirrus*
Barnea candida	*Macoma balthica*	*Polydora*
Bathyporeia	*Magelona*	*Pomatoceros triqueter*
Bathyporeia elegans	*Magelona johnstoni*	*Pontocrates altamarinus*
Bathyporeia guilliamsoniana	*Malacoceros*	*Pseudocuma*
Bodotria	*Malmgreniella*	*Pygospio elegans*
Callianassa	*Megaluropus agilis*	*Scalibregma inflatum*
Calliopius laeviusculus	*Metopa pusilla*	*Scoloplos armiger*
Capitella	*Microphthalmus*	*Sigalion mathildae*
Cirratulidae	*Microprotopus maculatus*	*Sphenia binghami*
Corophium	*Mya truncata*	*Spio*
Corophium acherusicum	*Mysella bidentata*	*Spiophanes bombyx*
Corophium sextonae	*Mytilus*	*Spisula*
Corophium volutator	*Nassarius reticulatus*	*Spisula elliptica*
Corystes cassivelaunus	*Neanthes*	*Spisula solida*
Crepidula fornicata	*Nephtys*	*Spisula subtruncata*
Diastylis bradyi	*Nephtys assimilis*	*Stenothoe marina*
Diastylis lucifera	*Nephtys caeca*	*Sthenelais boa*
Diastylis rugosa	*Nephtys cirrosa*	*Syllidia armata*
Diogenes pugilator	*Nephtys hombergii*	TANAIDACEA
Donax vitatus	*Nephtys longosetosa*	*Tellimya ferruginosa*
Echinocardium cordatum	*Nereis*	*Tellina (Moerella) pygmaeus*
Echinocyamus pusillus	*Notomastus latericeus*	*Tellina fabula*
Edwardsia	*Odontosyllis fulgurans*	*Tellina tenuis*
Ensis	OLIGOCHAETA	*Thia scutellata*
Ensis arcuatus	*Ophelia limacina*	*Typosyllis armillaris*
Ensis directus	*Ophiodromus flexuosus*	*Upogebia deltaura*
Ensis ensis	*Ophiura*	*Urothoe brevicornis*
Epitonium clathrus	*Ophiura albida*	*Urothoe elegans*
Eteone	*Ophiura ophiura*	*Urothoe poseidonis*
Eulalia bilineata	*Opisthobranchia*	*Urothoe pulchella*
Eumida	*Orchomene nana*	*Venerupis senegalensis*

Macoma balthica **habitat**	
Abludomelita obtusata	*Microprotopus maculatus*
Abra alba	*Mysella bidentata*
ACTINIARIA	*Mytilus*
Alitta succinea	*Neanthes*
Atylus falcatus	*Nephtys*
Atylus swammerdami	*Nephtys assimilis*
Autolytus	*Nephtys caeca*
Barnea candida	*Nephtys cirrosa*
Bathyporeia	*Nephtys hombergii*
Bathyporeia elegans	*Nereis*
Bathyporeia guilliamsoniana	*Notomastus latericeus*
Bathyporeia pelagica	*Odontosyllis fulgurans*
Bathyporeia sarsi	OLIGOCHAETA
Bodotria	*Ophiura*
Capitella	*Ophiura albida*
Cirratulidae	*Ophiura ophiura*
Corophium arenarium	*Owenia fusiformis*
Corophium volutator	*Pagurus bernhardus*
Diastylis bradyi	*Pariambus typicus*
Diastylis lucifera	*Parvicardium*
Diastylis rathkei	*Pectinaria koreni*
Diastylis rugosa	*Perioculodes longimanus*
Diogenes pugilator	*Petricola pholadiformis*
Donax vitatus	*Pholoe*
Ensis	*Phyllodoce*
Ensis arcuatus	*Phyllodoce mac/muc*
Ensis directus	*Phyllodoce rosea*
Eteone	*Polydora*
Eumida	*Pontocrates altamarinus*
Eunereis longissima	*Pontocrates arenarius*
Eurydice	*Pseudocuma*
Gammarus	*Pygospio elegans*
Gastrosaccus spinifer	*Scolelepis squamata*
Glycera	*Scoloplos armiger*
Glycera alba	*Sigalion mathildae*
Glycera lapidum	*Spio*
Harmothoe glabra	*Spiophanes bombyx*
Heteromastus filiformis	*Spisula subtruncata*
Idotea	*Sthenelais boa*
Lanice conchilega	*Streblospio benedicti*
Leucothoe	*Tellimya ferruginosa*
Macoma balthica	*Tellina fabula*
Magelona johnstoni	*Upogebia deltaura*
Malmgreniella	*Urothoe poseidonis*
Microphthalmus	

***Nephtys cirrosa* habitat**	
Abludomelita obtusata	*Nephtys cirrosa*
Abra alba	*Nephtys hombergii*
Abra prismatica	*Nephtys longosetosa*
ACTINIARIA	*Notomastus latericeus*
Ampelisca	OLIGOCHAETA
Aonides oxycephala	*Ophelia limacina*
Atylus falcatus	*Ophiura*
Atylus swammerdami	*Ophiura albida*
Autolytus	*Ophiura ophiura*
Bathyporeia	*Orchomene nana*
Bathyporeia elegans	*Pagurus bernhardus*
Bathyporeia guilliamsoniana	*Paraonis fulgens*
Bathyporeia pelagica	*Pariambus typicus*
Bathyporeia sarsi	*Pectinaria koreni*
Capitella	*Perioculodes longimanus*
Cirratulidae	*Petricola pholadiformis*
Crepidula fornicata	*Phyllodoce*
Diastylis bradyi	*Phyllodoce mac/muc*
Diogenes pugilator	*Phyllodoce rosea*
Donax vitatus	*Podarkeopsis helgolandica*
Echinocardium cordatum	*Poecilochaetus serpens*
Echinocyamus pusillus	*Pomatoceros triqueter*
Ensis	*Pontocrates altamarinus*
Ensis directus	*Pontocrates arenarius*
Epitonium clathrus	*Pseudoparatanais batei*
Eteone	*Pygospio elegans*
Eumida	*Scolelepis squamata*
Eunereis longissima	*Scoloplos armiger*
Gastrosaccus spinifer	*Sigalion mathildae*
Glycera alba	*Spio*
Glycera lapidum	*Spiophanes bombyx*
Hesionura elongata	*Spisula*
Heteromastus filiformis	*Spisula solida*
Lanice conchilega	*Spisula subtruncata*
Leucothoe	*Stenothoe marina*
Macoma balthica	*Sthenelais boa*
Magelona johnstoni	*Synchelidium maculatum*
Malmgreniella	*Tellimya ferruginosa*
Megaluropus agilis	*Tellina fabula*
Microphthalmus	*Tellina tenuis*
Microprotopus maculatus	*Thia scutellata*
Mysella bidentata	*Travisia forbesii*
Mytilus	*Urothoe brevicornis*
Nassarius reticulatus	*Urothoe poseidonis*
Nephtys	*Urothoe pulchella*
Nephtys assimilis	*Venerupis senegalensis*

6.3 Randomisation output files

DENSITY:

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Abra alba	0.103	70	140	211	1536	3817	7009	26844	35790	44737	89475
Abra alba	0.205	192	384	576	2513	4220	8145	25933	34576	43219	86439
Abra alba	0.308	382	765	1147	3147	5122	7841	22081	29440	36800	73600
Abra alba	0.411	477	954	1431	3319	5319	7578	18169	24225	30280	60561
Abra alba	0.514	577	1154	1731	3645	5344	7643	16537	22049	27560	55121
Abra alba	0.616	621	1242	1863	3875	5598	7841	15345	20460	25575	51150
Abra alba	0.719	738	1476	2215	3995	5419	7545	14377	19168	23960	47920
Abra alba	0.822	755	1511	2267	4241	5598	7675	13910	18546	23182	46364
Abra alba	0.924	796	1591	2387	4199	5573	7708	13010	17347	21683	43366
Abra alba	1.027	866	1732	2599	4369	5755	7841	12962	17282	21602	43204
Abra alba	1.130	936	1872	2809	4543	5835	7741	12816	17088	21360	42720
Abra alba	1.233	952	1903	2855	4521	5808	7841	12530	16706	20882	41764
Abra alba	1.335	941	1883	2824	4588	5808	7578	12341	16455	20568	41136
Abra alba	1.438	999	1999	2999	4633	5808	7384	11520	15359	19199	38397
Abra alba	1.541	1043	2087	3130	4678	5943	7545	11255	15006	18758	37515
Abra alba	1.643	1027	2053	3081	4746	5916	7545	11125	14832	18540	37080
Abra alba	1.746	1066	2132	3198	4815	5943	7448	11168	14890	18612	37225
Abra alba	1.849	1072	2143	3215	4931	6024	7481	10782	14376	17969	35938
Abra alba	1.952	1100	2201	3301	4885	5997	7416	10909	14546	18182	36363
Abra alba	2.054	1147	2295	3443	4908	5970	7384	10698	14263	17829	35657
Abra alba	2.157	1147	2295	3443	4931	5997	7416	10572	14095	17619	35238
Abra alba	2.260	1178	2355	3534	4979	6024	7384	10656	14207	17758	35517
Abra alba	2.362	1202	2405	3608	5050	6079	7321	10161	13548	16934	33869
Abra alba	2.465	1215	2430	3645	5050	6079	7448	10698	14263	17829	35657
Abra alba	2.568	1221	2442	3664	5050	6107	7353	10040	13386	16733	33466
Abra alba	2.671	1240	2480	3721	5122	6162	7289	9723	12964	16204	32408
Abra alba	2.773	1227	2455	3683	5098	6024	7195	10080	13440	16800	33599
Abra alba	2.876	1266	2531	3797	5171	6134	7289	10202	13602	17002	34004
Abra alba	2.979	1279	2557	3836	5147	6134	7133	9684	12911	16139	32278
Abra alba	3.081	1259	2518	3778	5074	6052	7289	9762	13016	16270	32539
Abra alba	3.184	1259	2518	3778	5196	6107	7226	9841	13121	16401	32802
Abra alba	3.287	1305	2610	3915	5220	6190	7226	9841	13121	16401	32802
Abra alba	3.390	1305	2610	3915	5269	6190	7195	9567	12756	15945	31889
Abra alba	3.492	1298	2596	3895	5269	6052	7133	9413	12551	15688	31377
Abra alba	3.595	1292	2583	3875	5294	6190	7195	9413	12551	15688	31377
Abra alba	3.698	1345	2690	4035	5269	6107	7102	9413	12551	15688	31377
Abra alba	3.800	1331	2663	3995	5294	6190	7226	9337	12449	15561	31123
Abra alba	3.903	1345	2690	4035	5319	6162	7195	9375	12500	15625	31249
Abra alba	4.006	1318	2636	3955	5294	6190	7133	9299	12399	15498	30996
Abra alba	4.109	1352	2703	4055	5344	6162	7164	9452	12602	15752	31504
Abra alba	4.211	1386	2772	4158	5319	6134	7102	9375	12500	15625	31249
Abra alba	4.314	1393	2785	4179	5344	6162	7102	9261	12348	15435	30870
Abra alba	4.417	1379	2758	4137	5419	6190	7040	9111	12148	15185	30370
Abra alba	4.519	1393	2785	4179	5369	6190	7133	9111	12148	15185	30370
Abra alba	4.622	1400	2799	4199	5419	6190	7040	8963	11950	14938	29875
Abra alba	4.725	1393	2785	4179	5419	6190	7009	9111	12148	15185	30370
Abra alba	4.828	1379	2758	4137	5369	6134	7009	8853	11804	14754	29509
Abra alba	4.930	1421	2841	4262	5419	6218	7071	8853	11804	14754	29509
Abra alba	5.033	1414	2827	4241	5394	6162	7040	9000	12000	14999	29998
Abra alba	5.136	1449	2898	4347	5445	6162	7071	9074	12098	15123	30245
Abra alba	5.238	1421	2841	4262	5445	6162	6948	8744	11658	14573	29145
Abra alba	5.341	1407	2813	4220	5445	6190	7040	8853	11804	14754	29509
Abra alba	5.444	1428	2855	4283	5470	6218	7009	8963	11950	14938	29875
Abra alba	5.547	1449	2898	4347	5521	6218	7040	8889	11852	14815	29630
Abra alba	5.649	1435	2869	4305	5445	6162	6948	8708	11610	14512	29025
Abra alba	5.752	1485	2970	4455	5521	6274	7071	8780	11707	14633	29266
Abra alba	5.855	1442	2884	4326	5470	6162	6948	8636	11514	14393	28785
Abra alba	5.957	1456	2912	4369	5547	6218	7009	8816	11755	14694	29387
Abra alba	6.060	1492	2985	4477	5521	6246	7009	8708	11610	14512	29025
Abra alba	6.163	1463	2927	4390	5496	6246	7040	8744	11658	14573	29145
Abra alba	6.266	1478	2955	4434	5547	6246	7009	8600	11467	14333	28666
Abra alba	6.368	1485	2970	4455	5496	6190	6979	8672	11562	14452	28905
Abra alba	6.471	1485	2970	4455	5496	6134	6918	8708	11610	14512	29025
Abra alba	6.574	1485	2970	4455	5521	6190	6948	8600	11467	14333	28666
Abra alba	6.676	1492	2985	4477	5547	6190	6948	8636	11514	14393	28785
Abra alba	6.779	1485	2970	4455	5521	6218	7009	8636	11514	14393	28785
Abra alba	6.882	1492	2985	4477	5573	6246	6979	8636	11514	14393	28785
Abra alba	6.985	1492	2985	4477	5547	6218	6948	8458	11277	14096	28193
Abra alba	7.087	1507	3014	4521	5573	6246	6948	8493	11324	14155	28310
Abra alba	7.190	1492	2985	4477	5573	6246	6979	8529	11372	14214	28429
Abra alba	7.293	1529	3058	4588	5624	6190	6888	8423	11230	14038	28075
Abra alba	7.395	1522	3043	4565	5598	6246	6918	8353	11137	13921	27842
Abra alba	7.498	1500	2999	4499	5547	6218	6948	8388	11183	13979	27958
Abra alba	7.601	1529	3058	4588	5598	6274	6948	8388	11183	13979	27958
Abra alba	7.704	1522	3043	4565	5598	6246	6948	8493	11324	14155	28310
Abra alba	7.806	1507	3014	4521	5573	6162	6857	8318	11090	13863	27725
Abra alba	7.909	1552	3103	4655	5650	6246	6918	8388	11183	13979	27958
Abra alba	8.012	1529	3058	4588	5598	6190	6827	8318	11090	13863	27725
Abra alba	8.114	1514	3029	4543	5624	6218	6857	8214	10952	13689	27378
Abra alba	8.217	1552	3103	4655	5624	6218	6888	8353	11137	13921	27842
Abra alba	8.320	1559	3118	4678	5650	6218	6857	8179	10906	13632	27264
Abra alba	8.423	1574	3148	4723	5676	6246	6918	8423	11230	14038	28075
Abra alba	8.525	1552	3103	4655	5624	6246	6857	8353	11137	13921	27842
Abra alba	8.628	1544	3088	4633	5624	6246	6827	8179	10906	13632	27264
Abra alba	8.731	1559	3118	4678	5624	6218	6827	8214	10952	13689	27378
Abra alba	8.833	1574	3148	4723	5624	6190	6797	8214	10952	13689	27378
Abra alba	8.936	1567	3133	4700	5650	6246	6888	8179	10906	13632	27264

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Abra alba	9.039	1582	3164	4746	5650	6246	6797	8214	10952	13689	27378
Abra alba	9.142	1544	3088	4633	5650	6190	6888	8179	10906	13632	27264
Abra alba	9.244	1559	3118	4678	5624	6190	6827	8214	10952	13689	27378
Abra alba	9.347	1574	3148	4723	5624	6246	6857	8145	10860	13575	27149
Abra alba	9.450	1582	3164	4746	5650	6218	6827	8145	10860	13575	27149
Abra alba	9.552	1582	3164	4746	5729	6274	6888	8214	10952	13689	27378
Abra alba	9.655	1559	3118	4678	5676	6246	6857	8214	10952	13689	27378
Abra alba	9.758	1574	3148	4723	5729	6246	6888	8214	10952	13689	27378
Abra alba	9.861	1605	3210	4815	5650	6190	6827	8145	10860	13575	27149
Abra alba	9.963	1582	3164	4746	5650	6218	6857	8077	10769	13461	26921
Abra alba	10.066	1589	3179	4769	5650	6190	6768	8009	10678	13347	26695
Abra alba	10.169	1582	3164	4746	5703	6274	6857	8111	10814	13517	27035
Abra alba	10.271	1574	3148	4723	5703	6246	6857	8077	10769	13461	26921
Abra alba	10.374	1574	3148	4723	5676	6218	6857	8077	10769	13461	26921
Abra alba	10.477	1605	3210	4815	5729	6246	6857	8043	10723	13404	26808
Abra alba	10.580	1605	3210	4815	5729	6246	6827	8077	10769	13461	26921
Abra alba	10.682	1605	3210	4815	5729	6218	6827	8111	10814	13517	27035
Abra alba	10.785	1589	3179	4769	5703	6246	6797	8009	10678	13347	26695
Abra alba	10.888	1605	3210	4815	5703	6218	6797	8043	10723	13404	26808
Abra alba	10.990	1605	3210	4815	5703	6246	6768	7975	10633	13291	26582
Abra alba	11.093	1620	3240	4861	5755	6274	6827	8145	10860	13575	27149
Abra alba	11.196	1612	3225	4838	5755	6246	6797	8043	10723	13404	26808
Abra alba	11.299	1628	3256	4885	5729	6246	6797	8214	10952	13689	27378
Abra alba	11.401	1628	3256	4885	5729	6274	6827	8043	10723	13404	26808
Abra alba	11.504	1612	3225	4838	5729	6218	6827	8009	10678	13347	26695
Abra alba	11.607	1612	3225	4838	5729	6246	6797	7941	10588	13235	26470
Abra alba	11.709	1620	3240	4861	5729	6274	6797	8043	10723	13404	26808
Abra alba	11.812	1605	3210	4815	5729	6218	6768	8077	10769	13461	26921
Abra alba	11.915	1628	3256	4885	5755	6246	6797	7841	10454	13067	26135
Abra alba	12.018	1605	3210	4815	5729	6246	6768	8009	10678	13347	26695
Abra alba	12.120	1620	3240	4861	5755	6274	6797	7975	10633	13291	26582
Abra alba	12.223	1628	3256	4885	5729	6246	6797	8043	10723	13404	26808
Abra alba	12.326	1628	3256	4885	5729	6246	6797	7975	10633	13291	26582
Abra alba	12.428	1628	3256	4885	5782	6302	6797	7941	10588	13235	26470
Abra alba	12.531	1636	3272	4908	5755	6274	6797	7874	10499	13123	26246
Abra alba	12.634	1644	3287	4931	5782	6274	6827	7874	10499	13123	26246
Abra alba	12.737	1636	3272	4908	5729	6218	6768	7975	10633	13291	26582
Abra alba	12.839	1644	3287	4931	5755	6246	6768	7874	10499	13123	26246
Abra alba	12.942	1652	3303	4955	5755	6218	6768	7841	10454	13067	26135
Abra alba	13.045	1628	3256	4885	5755	6218	6738	7807	10410	13012	26024
Abra alba	13.147	1628	3256	4885	5755	6274	6768	7807	10410	13012	26024
Abra alba	13.250	1636	3272	4908	5729	6218	6738	7874	10499	13123	26246
Abra alba	13.353	1628	3256	4885	5755	6246	6797	7841	10454	13067	26135
Abra alba	13.456	1652	3303	4955	5755	6246	6768	7874	10499	13123	26246
Abra alba	13.558	1644	3287	4931	5782	6246	6768	7807	10410	13012	26024
Abra alba	13.661	1620	3240	4861	5755	6246	6738	7807	10410	13012	26024
Abra alba	13.764	1659	3319	4979	5782	6246	6738	7807	10410	13012	26024
Abra alba	13.866	1667	3335	5002	5755	6218	6738	7841	10454	13067	26135
Abra alba	13.969	1652	3303	4955	5782	6218	6738	7841	10454	13067	26135
Abra alba	14.072	1683	3366	5050	5808	6274	6797	7774	10365	12957	25913
Abra alba	14.175	1667	3335	5002	5782	6246	6738	7807	10410	13012	26024
Abra alba	14.277	1652	3303	4955	5782	6246	6768	7741	10321	12902	25803
Abra alba	14.380	1659	3319	4979	5808	6218	6768	7774	10365	12957	25913
Abra alba	14.483	1683	3366	5050	5808	6246	6738	7741	10321	12902	25803
Abra alba	14.585	1675	3351	5026	5755	6218	6738	7807	10410	13012	26024
Abra alba	14.688	1667	3335	5002	5808	6246	6738	7807	10410	13012	26024
Abra alba	14.791	1667	3335	5002	5782	6246	6708	7708	10277	12847	25693
Abra alba	14.894	1683	3366	5050	5782	6246	6708	7675	10234	12792	25584
Abra alba	14.996	1659	3319	4979	5755	6218	6678	7675	10234	12792	25584
Abra alba	15.099	1683	3366	5050	5782	6246	6768	7708	10277	12847	25693
Abra alba	15.202	1683	3366	5050	5808	6274	6738	7841	10454	13067	26135
Abra alba	15.304	1675	3351	5026	5808	6246	6708	7741	10321	12902	25803
Abra alba	15.407	1699	3399	5098	5782	6246	6678	7741	10321	12902	25803
Abra alba	15.510	1675	3351	5026	5808	6246	6768	7741	10321	12902	25803
Abra alba	15.613	1683	3366	5050	5808	6274	6708	7643	10190	12737	25475
Abra alba	15.715	1691	3382	5074	5808	6274	6738	7774	10365	12957	25913
Abra alba	15.818	1691	3382	5074	5782	6246	6738	7708	10277	12847	25693
Abra alba	15.921	1691	3382	5074	5808	6246	6708	7741	10321	12902	25803
Abra alba	16.023	1683	3366	5050	5782	6274	6708	7774	10365	12957	25913
Abra alba	16.126	1691	3382	5074	5808	6246	6678	7708	10277	12847	25693
Abra alba	16.229	1691	3382	5074	5782	6246	6738	7708	10277	12847	25693
Abra alba	16.332	1683	3366	5050	5782	6246	6738	7741	10321	12902	25803
Abra alba	16.434	1683	3366	5050	5835	6274	6708	7675	10234	12792	25584
Abra alba	16.537	1691	3382	5074	5835	6274	6768	7643	10190	12737	25475
Abra alba	16.640	1683	3366	5050	5835	6246	6708	7708	10277	12847	25693
Abra alba	16.742	1699	3399	5098	5835	6246	6708	7675	10234	12792	25584
Abra alba	16.845	1691	3382	5074	5835	6246	6738	7807	10410	13012	26024
Abra alba	16.948	1699	3399	5098	5835	6246	6708	7643	10190	12737	25475
Abra alba	17.051	1707	3415	5122	5835	6246	6708	7610	10146	12683	25366
Abra alba	17.153	1699	3399	5098	5808	6246	6708	7774	10365	12957	25913
Abra alba	17.256	1699	3399	5098	5808	6246	6708	7578	10103	12629	25257
Abra alba	17.359	1691	3382	5074	5835	6246	6708	7741	10321	12902	25803
Abra alba	17.461	1699	3399	5098	5835	6246	6708	7610	10146	12683	25366
Abra alba	17.564	1707	3415	5122	5808	6274	6678	7708	10277	12847	25693
Abra alba	17.667	1715	3431	5147	5835	6246	6708	7610	10146	12683	25366
Abra alba	17.770	1707	3415	5122	5835	6274	6708	7643	10190	12737	25475
Abra alba	17.872	1707	3415	5122	5808	6246	6708	7545	10060	12575	25149
Abra alba	17.975	1707	3415	5122	5835	6246	6708	7578	10103	12629	25257
Abra alba	18.078	1707	3415	5122	5862	6302	6738	7610	10146	12683	25366
Abra alba	18.180	1699	3399	5098	5862	6246	6649	7578	10103	12629	25257
Abra alba	18.283	1724	3447	5171	5862	6274	6738	7643	10190	12737	25475
Abra alba	18.386	1724	3447	5171	5862	6274	6678	7610	10146	12683	25366
Abra alba	18.489	1724	3447	5171	5835	6246	6708	7643	10190	12737	25475
Abra alba	18.591	1732	3463	5196	5862	6246	6678	7643	10190	12737	25475
Abra alba	18.694	1707	3415	5122	5862	6274	6708	7610	10146	12683	25366
Abra alba	18.797	1707	3415	5122	5862	6246	6678	7513	10017	12521	25041
Abra alba	18.899	1707	3415	5122	5835	6246	6678	7578	10103	12629	25257

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Abra alba	19.002	1715	3431	5147	5862	6246	6678	7545	10060	12575	25149
Abra alba	19.105	1707	3415	5122	5835	6302	6708	7643	10190	12737	25475
Abra alba	19.208	1724	3447	5171	5862	6274	6738	7578	10103	12629	25257
Abra alba	19.310	1707	3415	5122	5862	6246	6678	7610	10146	12683	25366
Abra alba	19.413	1724	3447	5171	5862	6246	6708	7578	10103	12629	25257
Abra alba	19.516	1707	3415	5122	5835	6246	6649	7513	10017	12521	25041
Abra alba	19.618	1732	3463	5196	5862	6246	6649	7481	9974	12467	24934
Abra alba	19.721	1724	3447	5171	5835	6246	6678	7578	10103	12629	25257
Abra alba	19.824	1748	3496	5245	5862	6274	6708	7545	10060	12575	25149
Abra alba	19.927	1707	3415	5122	5862	6246	6678	7513	10017	12521	25041
Abra alba	20.029	1732	3463	5196	5862	6246	6678	7545	10060	12575	25149
Abra alba	20.132	1724	3447	5171	5862	6246	6649	7481	9974	12467	24934
Abra alba	20.235	1715	3431	5147	5835	6218	6649	7513	10017	12521	25041
Abra alba	20.337	1724	3447	5171	5862	6274	6649	7448	9931	12413	24827
Abra alba	20.440	1724	3447	5171	5862	6274	6708	7643	10190	12737	25475
Abra alba	20.543	1740	3480	5220	5862	6302	6708	7545	10060	12575	25149
Abra alba	20.646	1740	3480	5220	5862	6246	6678	7643	10190	12737	25475
Abra alba	20.748	1740	3480	5220	5862	6246	6620	7481	9974	12467	24934
Abra alba	20.851	1724	3447	5171	5862	6274	6708	7610	10146	12683	25366
Abra alba	20.954	1748	3496	5245	5889	6274	6678	7513	10017	12521	25041
Abra alba	21.056	1740	3480	5220	5862	6246	6649	7513	10017	12521	25041
Abra alba	21.159	1724	3447	5171	5862	6274	6678	7545	10060	12575	25149
Abra alba	21.262	1732	3463	5196	5889	6274	6678	7448	9931	12413	24827
Abra alba	21.365	1732	3463	5196	5916	6274	6678	7578	10103	12629	25257
Abra alba	21.467	1740	3480	5220	5889	6246	6649	7448	9931	12413	24827
Abra alba	21.570	1748	3496	5245	5916	6274	6678	7481	9974	12467	24934
Abra alba	21.673	1724	3447	5171	5889	6274	6678	7481	9974	12467	24934
Abra alba	21.775	1740	3480	5220	5916	6302	6678	7545	10060	12575	25149
Abra alba	21.878	1748	3496	5245	5889	6274	6678	7513	10017	12521	25041
Abra alba	21.981	1756	3513	5269	5889	6246	6678	7545	10060	12575	25149
Abra alba	22.084	1732	3463	5196	5916	6274	6678	7513	10017	12521	25041
Abra alba	22.186	1756	3513	5269	5916	6274	6649	7448	9931	12413	24827
Abra alba	22.289	1740	3480	5220	5889	6246	6649	7448	9931	12413	24827
Abra alba	22.392	1756	3513	5269	5889	6274	6678	7513	10017	12521	25041
Abra alba	22.494	1740	3480	5220	5916	6274	6678	7481	9974	12467	24934
Abra alba	22.597	1732	3463	5196	5862	6246	6649	7448	9931	12413	24827
Abra alba	22.700	1740	3480	5220	5889	6274	6620	7384	9846	12307	24614
Abra alba	22.803	1732	3463	5196	5862	6218	6620	7416	9888	12360	24720
Abra alba	22.905	1756	3513	5269	5916	6274	6678	7481	9974	12467	24934
Abra alba	23.008	1748	3496	5245	5916	6274	6649	7481	9974	12467	24934
Abra alba	23.111	1765	3529	5294	5889	6274	6649	7481	9974	12467	24934
Abra alba	23.213	1748	3496	5245	5889	6246	6620	7416	9888	12360	24720
Abra alba	23.316	1748	3496	5245	5889	6274	6649	7416	9888	12360	24720
Abra alba	23.419	1756	3513	5269	5889	6274	6649	7448	9931	12413	24827
Abra alba	23.522	1765	3529	5294	5943	6302	6678	7513	10017	12521	25041
Abra alba	23.624	1748	3496	5245	5889	6246	6678	7481	9974	12467	24934
Abra alba	23.727	1756	3513	5269	5862	6246	6620	7416	9888	12360	24720
Abra alba	23.830	1756	3513	5269	5862	6246	6649	7416	9888	12360	24720
Abra alba	23.932	1756	3513	5269	5916	6274	6620	7353	9803	12254	24508
Abra alba	24.035	1756	3513	5269	5862	6246	6620	7416	9888	12360	24720
Abra alba	24.138	1756	3513	5269	5889	6246	6649	7448	9931	12413	24827
Abra alba	24.241	1740	3480	5220	5889	6246	6649	7481	9974	12467	24934
Abra alba	24.343	1773	3546	5319	5889	6274	6649	7448	9931	12413	24827
Abra alba	24.446	1765	3529	5294	5916	6246	6620	7481	9974	12467	24934
Abra alba	24.549	1765	3529	5294	5916	6274	6649	7416	9888	12360	24720
Abra alba	24.651	1773	3546	5319	5916	6274	6649	7416	9888	12360	24720
Abra alba	24.754	1765	3529	5294	5916	6274	6649	7448	9931	12413	24827
Abra alba	24.857	1781	3562	5344	5916	6274	6649	7416	9888	12360	24720
Abra alba	24.960	1756	3513	5269	5916	6302	6649	7353	9803	12254	24508
Abra alba	25.062	1756	3513	5269	5916	6274	6678	7481	9974	12467	24934
Abra alba	25.165	1773	3546	5319	5916	6246	6620	7353	9803	12254	24508
Abra alba	25.268	1773	3546	5319	5916	6274	6649	7416	9888	12360	24720
Abra alba	25.370	1773	3546	5319	5916	6274	6649	7353	9803	12254	24508
Abra alba	25.473	1756	3513	5269	5943	6274	6649	7384	9846	12307	24614
Abra alba	25.576	1765	3529	5294	5916	6274	6620	7416	9888	12360	24720
Abra alba	25.679	1756	3513	5269	5916	6274	6620	7481	9974	12467	24934
Abra alba	25.781	1773	3546	5319	5889	6246	6620	7416	9888	12360	24720
Abra alba	25.884	1781	3562	5344	5916	6274	6649	7416	9888	12360	24720
Abra alba	25.987	1756	3513	5269	5916	6246	6620	7353	9803	12254	24508
Abra alba	26.089	1773	3546	5319	5916	6274	6620	7321	9761	12201	24402
Abra alba	26.192	1773	3546	5319	5916	6274	6649	7481	9974	12467	24934
Abra alba	26.295	1789	3579	5369	5916	6246	6620	7321	9761	12201	24402
Abra alba	26.398	1748	3496	5245	5916	6246	6620	7353	9803	12254	24508
Abra alba	26.500	1765	3529	5294	5943	6274	6649	7289	9719	12148	24297
Abra alba	26.603	1781	3562	5344	5889	6246	6620	7353	9803	12254	24508
Abra alba	26.706	1773	3546	5319	5943	6246	6620	7321	9761	12201	24402
Abra alba	26.808	1773	3546	5319	5943	6274	6649	7384	9846	12307	24614
Abra alba	26.911	1765	3529	5294	5943	6274	6620	7384	9846	12307	24614
Abra alba	27.014	1773	3546	5319	5916	6246	6620	7384	9846	12307	24614
Abra alba	27.117	1781	3562	5344	5943	6274	6649	7448	9931	12413	24827
Abra alba	27.219	1773	3546	5319	5916	6246	6620	7353	9803	12254	24508
Abra alba	27.322	1765	3529	5294	5889	6246	6620	7384	9846	12307	24614
Abra alba	27.425	1765	3529	5294	5916	6274	6620	7384	9846	12307	24614
Abra alba	27.527	1773	3546	5319	5943	6274	6649	7321	9761	12201	24402
Abra alba	27.630	1781	3562	5344	5916	6274	6620	7353	9803	12254	24508
Abra alba	27.733	1773	3546	5319	5970	6274	6620	7384	9846	12307	24614
Abra alba	27.836	1773	3546	5319	5943	6246	6620	7416	9888	12360	24720
Abra alba	27.938	1773	3546	5319	5916	6274	6620	7289	9719	12148	24297
Abra alba	28.041	1773	3546	5319	5943	6274	6678	7384	9846	12307	24614
Abra alba	28.144	1798	3596	5394	5943	6274	6620	7321	9761	12201	24402
Abra alba	28.246	1789	3579	5369	5970	6302	6620	7353	9803	12254	24508
Abra alba	28.349	1789	3579	5369	5943	6274	6620	7353	9803	12254	24508
Abra alba	28.452	1798	3596	5394	5943	6302	6649	7384	9846	12307	24614
Abra alba	28.555	1773	3546	5319	5916	6246	6590	7321	9761	12201	24402

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Macoma balthica	0.102	10	20	29	131	253	586	5220	6960	8700	17400
Macoma balthica	0.203	21	43	64	204	352	731	3608	4810	6012	12025
Macoma balthica	0.305	34	67	101	236	399	825	3570	4760	5950	11901
Macoma balthica	0.406	41	83	124	269	448	1228	2871	3828	4785	9570
Macoma balthica	0.508	48	96	143	297	480	1139	2570	3426	4283	8566
Macoma balthica	0.609	54	108	162	326	540	1078	2176	2901	3627	7253
Macoma balthica	0.711	60	121	181	336	562	1048	2360	3147	3933	7867
Macoma balthica	0.813	62	124	185	355	615	1005	2151	2868	3584	7169
Macoma balthica	0.914	65	129	194	361	656	1041	2064	2751	3439	6879
Macoma balthica	1.016	70	140	211	406	720	1101	2113	2817	3522	7043
Macoma balthica	1.117	74	148	222	414	703	1078	1979	2639	3299	6597
Macoma balthica	1.219	76	151	227	421	693	1041	1807	2409	3012	6024
Macoma balthica	1.320	77	154	231	429	682	1019	1763	2351	2939	5877
Macoma balthica	1.422	80	159	239	452	687	990	1720	2293	2867	5733
Macoma balthica	1.523	85	171	256	492	703	1012	1657	2209	2761	5523
Macoma balthica	1.625	86	172	259	480	714	1019	1720	2293	2867	5733
Macoma balthica	1.727	89	178	266	492	726	1005	1646	2195	2744	5488
Macoma balthica	1.828	93	187	280	496	726	998	1657	2209	2761	5523
Macoma balthica	1.930	91	181	272	505	714	1012	1606	2141	2676	5352
Macoma balthica	2.031	96	192	288	526	731	976	1565	2087	2609	5218
Macoma balthica	2.133	97	194	291	522	726	976	1536	2048	2559	5119
Macoma balthica	2.234	96	192	288	535	748	969	1526	2034	2543	5086
Macoma balthica	2.336	98	196	294	531	731	969	1516	2021	2527	5054
Macoma balthica	2.438	105	209	314	549	748	976	1497	1996	2495	4989
Macoma balthica	2.539	103	205	308	549	737	969	1459	1945	2431	4862
Macoma balthica	2.641	107	213	320	558	748	963	1478	1970	2463	4925
Macoma balthica	2.742	106	211	317	562	742	969	1478	1970	2463	4925
Macoma balthica	2.844	106	211	317	553	726	935	1412	1883	2353	4707
Macoma balthica	2.945	111	222	332	572	742	935	1376	1834	2292	4585
Macoma balthica	3.047	108	215	323	576	748	942	1403	1870	2338	4676
Macoma balthica	3.149	113	226	339	576	754	956	1403	1870	2338	4676
Macoma balthica	3.250	117	234	352	591	742	956	1394	1858	2323	4645
Macoma balthica	3.352	115	230	345	596	760	976	1421	1895	2369	4737
Macoma balthica	3.453	118	236	355	600	765	969	1394	1858	2323	4645
Macoma balthica	3.555	118	236	355	596	754	956	1394	1858	2323	4645
Macoma balthica	3.656	123	245	368	591	760	949	1349	1798	2248	4495
Macoma balthica	3.758	126	252	378	596	748	942	1385	1846	2308	4615
Macoma balthica	3.860	124	248	371	600	754	922	1349	1798	2248	4495
Macoma balthica	3.961	126	252	378	591	748	922	1331	1774	2218	4436
Macoma balthica	4.063	130	259	389	600	754	942	1322	1763	2203	4407
Macoma balthica	4.164	126	252	378	605	754	935	1340	1786	2233	4466
Macoma balthica	4.266	128	257	385	596	748	922	1313	1751	2189	4378
Macoma balthica	4.367	131	261	392	615	765	935	1313	1751	2189	4378
Macoma balthica	4.469	132	264	396	610	748	915	1287	1716	2146	4291
Macoma balthica	4.570	135	271	406	610	760	915	1322	1763	2203	4407
Macoma balthica	4.672	137	273	410	605	748	908	1262	1682	2103	4206
Macoma balthica	4.774	134	269	403	620	754	928	1262	1682	2103	4206
Macoma balthica	4.875	138	276	414	620	760	922	1279	1705	2131	4263
Macoma balthica	4.977	138	276	414	615	754	908	1262	1682	2103	4206
Macoma balthica	5.078	135	271	406	615	754	895	1253	1671	2089	4178
Macoma balthica	5.180	139	278	417	630	765	915	1228	1638	2047	4094
Macoma balthica	5.281	139	278	417	630	760	915	1262	1682	2103	4206
Macoma balthica	5.383	139	278	417	620	748	895	1245	1660	2075	4150
Macoma balthica	5.485	143	286	429	635	765	922	1220	1627	2033	4066
Macoma balthica	5.586	142	283	425	625	754	908	1195	1594	1992	3984
Macoma balthica	5.688	145	291	436	635	765	908	1245	1660	2075	4150
Macoma balthica	5.789	145	291	436	640	765	915	1228	1638	2047	4094
Macoma balthica	5.891	145	291	436	640	765	902	1204	1605	2006	4012
Macoma balthica	5.992	145	291	436	630	765	902	1220	1627	2033	4066
Macoma balthica	6.094	143	286	429	635	765	902	1228	1638	2047	4094
Macoma balthica	6.196	144	288	432	630	760	915	1228	1638	2047	4094
Macoma balthica	6.297	148	296	444	640	765	908	1204	1605	2006	4012
Macoma balthica	6.399	148	296	444	645	765	908	1220	1627	2033	4066
Macoma balthica	6.500	151	301	452	635	765	908	1204	1605	2006	4012
Macoma balthica	6.602	153	306	460	645	765	908	1187	1583	1979	3957
Macoma balthica	6.703	152	304	456	635	760	902	1212	1616	2019	4039
Macoma balthica	6.805	157	314	472	650	777	902	1195	1594	1992	3984
Macoma balthica	6.906	153	306	460	645	771	895	1195	1594	1992	3984
Macoma balthica	7.008	153	306	460	645	765	889	1179	1572	1965	3931
Macoma balthica	7.110	156	312	468	650	777	902	1163	1551	1939	3877
Macoma balthica	7.211	161	323	484	650	771	889	1155	1540	1925	3851
Macoma balthica	7.313	154	309	464	656	771	895	1163	1551	1939	3877
Macoma balthica	7.414	154	309	464	650	760	889	1179	1572	1965	3931
Macoma balthica	7.516	156	312	468	650	765	889	1171	1562	1952	3904
Macoma balthica	7.617	153	306	460	650	771	895	1155	1540	1925	3851
Macoma balthica	7.719	161	323	484	656	771	895	1171	1562	1952	3904
Macoma balthica	7.821	160	320	480	656	765	889	1163	1551	1939	3877
Macoma balthica	7.922	159	317	476	650	765	889	1171	1562	1952	3904
Macoma balthica	8.024	160	320	480	661	765	889	1155	1540	1925	3851
Macoma balthica	8.125	159	317	476	650	765	889	1147	1530	1912	3824
Macoma balthica	8.227	161	323	484	656	765	882	1147	1530	1912	3824
Macoma balthica	8.328	160	320	480	650	754	869	1116	1488	1860	3720
Macoma balthica	8.430	163	325	488	661	771	889	1163	1551	1939	3877
Macoma balthica	8.532	160	320	480	656	765	882	1147	1530	1912	3824
Macoma balthica	8.633	163	325	488	661	765	882	1147	1530	1912	3824
Macoma balthica	8.735	164	328	492	661	765	889	1155	1540	1925	3851
Macoma balthica	8.836	160	320	480	666	771	882	1132	1509	1886	3772
Macoma balthica	8.938	165	331	496	661	771	882	1132	1509	1886	3772
Macoma balthica	9.039	161	323	484	666	771	876	1132	1509	1886	3772
Macoma balthica	9.141	165	331	496	666	765	882	1124	1498	1873	3746
Macoma balthica	9.243	163	325	488	656	765	889	1139	1519	1899	3798
Macoma balthica	9.344	165	331	496	661	760	876	1116	1488	1860	3720
Macoma balthica	9.446	165	331	496	661	765	876	1116	1488	1860	3720
Macoma balthica	9.547	165	331	496	650	765	876	1101	1468	1835	3669
Macoma balthica	9.649	167	334	501	666	771	882	1132	1509	1886	3772
Macoma balthica	9.750	167	334	501	666	771	882	1108	1478	1847	3695
Macoma balthica	9.852	168	336	505	677	777	876	1124	1498	1873	3746
Macoma balthica	9.953	168	336	505	671	771	876	1124	1498	1873	3746

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Macoma balthica	10.055	170	339	509	677	771	869	1108	1478	1847	3695
Macoma balthica	10.157	173	345	518	666	771	876	1108	1478	1847	3695
Macoma balthica	10.258	171	342	513	671	771	882	1124	1498	1873	3746
Macoma balthica	10.360	174	348	522	671	765	869	1093	1457	1822	3644
Macoma balthica	10.461	167	334	501	666	765	882	1108	1478	1847	3695
Macoma balthica	10.563	168	336	505	677	765	869	1086	1447	1809	3618
Macoma balthica	10.664	173	345	518	682	777	876	1101	1468	1835	3669
Macoma balthica	10.766	171	342	513	671	771	869	1086	1447	1809	3618
Macoma balthica	10.868	170	339	509	666	771	869	1116	1488	1860	3720
Macoma balthica	10.969	173	345	518	666	771	876	1093	1457	1822	3644
Macoma balthica	11.071	173	345	518	682	771	869	1101	1468	1835	3669
Macoma balthica	11.172	173	345	518	682	771	876	1101	1468	1835	3669
Macoma balthica	11.274	171	342	513	677	765	869	1093	1457	1822	3644
Macoma balthica	11.375	174	348	522	671	765	869	1078	1437	1797	3593
Macoma balthica	11.477	180	360	540	682	777	876	1078	1437	1797	3593
Macoma balthica	11.579	178	357	535	677	777	876	1086	1447	1809	3618
Macoma balthica	11.680	174	348	522	677	765	869	1070	1427	1784	3568
Macoma balthica	11.782	177	354	531	687	777	876	1086	1447	1809	3618
Macoma balthica	11.883	178	357	535	682	771	869	1070	1427	1784	3568
Macoma balthica	11.985	175	351	526	682	777	876	1063	1417	1772	3543
Macoma balthica	12.086	175	351	526	677	765	863	1078	1437	1797	3593
Macoma balthica	12.188	174	348	522	677	771	869	1086	1447	1809	3618
Macoma balthica	12.290	174	348	522	677	771	863	1070	1427	1784	3568
Macoma balthica	12.391	177	354	531	677	771	869	1063	1417	1772	3543
Macoma balthica	12.493	175	351	526	682	771	863	1078	1437	1797	3593
Macoma balthica	12.594	177	354	531	677	771	869	1086	1447	1809	3618
Macoma balthica	12.696	173	345	518	677	765	869	1086	1447	1809	3618
Macoma balthica	12.797	175	351	526	677	765	863	1056	1407	1759	3519
Macoma balthica	12.899	178	357	535	687	777	863	1063	1417	1772	3543
Macoma balthica	13.000	177	354	531	687	771	869	1063	1417	1772	3543
Macoma balthica	13.102	177	354	531	677	771	863	1048	1398	1747	3494
Macoma balthica	13.204	178	357	535	687	771	876	1078	1437	1797	3593
Macoma balthica	13.305	177	354	531	677	771	869	1048	1398	1747	3494
Macoma balthica	13.407	180	360	540	687	771	863	1063	1417	1772	3543
Macoma balthica	13.508	178	357	535	687	771	869	1070	1427	1784	3568
Macoma balthica	13.610	181	363	544	693	777	869	1063	1417	1772	3543
Macoma balthica	13.711	183	366	549	687	777	869	1070	1427	1784	3568
Macoma balthica	13.813	183	366	549	687	777	869	1070	1427	1784	3568
Macoma balthica	13.915	180	360	540	687	765	857	1063	1417	1772	3543
Macoma balthica	14.016	178	357	535	682	765	857	1048	1398	1747	3494
Macoma balthica	14.118	183	366	549	687	771	869	1063	1417	1772	3543
Macoma balthica	14.219	181	363	544	682	771	869	1056	1407	1759	3519
Macoma balthica	14.321	184	369	553	687	771	863	1048	1398	1747	3494
Macoma balthica	14.422	183	366	549	693	777	869	1056	1407	1759	3519
Macoma balthica	14.524	181	363	544	693	771	863	1048	1398	1747	3494
Macoma balthica	14.626	181	363	544	693	777	869	1063	1417	1772	3543
Macoma balthica	14.727	183	366	549	687	777	869	1056	1407	1759	3519
Macoma balthica	14.829	183	366	549	693	771	863	1041	1388	1735	3469
Macoma balthica	14.930	183	366	549	687	771	857	1034	1378	1723	3445
Macoma balthica	15.032	186	372	558	693	771	863	1041	1388	1735	3469
Macoma balthica	15.133	184	369	553	693	777	869	1063	1417	1772	3543
Macoma balthica	15.235	187	375	562	693	777	863	1056	1407	1759	3519
Macoma balthica	15.336	186	372	558	687	765	850	1026	1368	1710	3421
Macoma balthica	15.438	184	369	553	698	777	863	1048	1398	1747	3494
Macoma balthica	15.540	183	366	549	687	783	869	1048	1398	1747	3494
Macoma balthica	15.641	186	372	558	687	771	857	1048	1398	1747	3494
Macoma balthica	15.743	181	363	544	693	771	850	1026	1368	1710	3421
Macoma balthica	15.844	187	375	562	693	771	850	1041	1388	1735	3469
Macoma balthica	15.946	186	372	558	693	777	869	1048	1398	1747	3494
Macoma balthica	16.047	187	375	562	693	777	863	1056	1407	1759	3519
Macoma balthica	16.149	187	375	562	693	765	857	1026	1368	1710	3421
Macoma balthica	16.251	187	375	562	693	771	857	1041	1388	1735	3469
Macoma balthica	16.352	186	372	558	698	771	857	1019	1359	1698	3397
Macoma balthica	16.454	183	366	549	693	777	863	1048	1398	1747	3494
Macoma balthica	16.555	189	378	567	698	771	857	1034	1378	1723	3445
Macoma balthica	16.657	189	378	567	698	771	857	1019	1359	1698	3397
Macoma balthica	16.758	186	372	558	693	771	857	1012	1349	1686	3373
Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Nephtys cirrosa	0.105	16	32	49	140	224	425	1459	1945	2431	4862
Nephtys cirrosa	0.210	26	53	79	174	264	417	1041	1388	1735	3469
Nephtys cirrosa	0.314	33	66	100	198	274	414	976	1302	1627	3255
Nephtys cirrosa	0.419	40	80	120	211	291	421	928	1238	1547	3095
Nephtys cirrosa	0.524	47	93	140	217	302	425	850	1134	1417	2834
Nephtys cirrosa	0.629	48	97	145	229	308	414	789	1052	1315	2630
Nephtys cirrosa	0.733	49	99	148	239	308	414	714	953	1191	2381
Nephtys cirrosa	0.838	52	105	157	243	314	406	682	909	1136	2273
Nephtys cirrosa	0.943	55	111	166	246	308	403	645	860	1075	2151
Nephtys cirrosa	1.048	55	111	166	248	311	403	630	840	1050	2100
Nephtys cirrosa	1.153	59	117	176	256	317	396	610	813	1017	2034
Nephtys cirrosa	1.257	60	120	179	264	323	403	620	827	1033	2067
Nephtys cirrosa	1.362	61	122	183	264	323	396	581	775	969	1937
Nephtys cirrosa	1.467	64	128	192	266	320	392	586	781	977	1953
Nephtys cirrosa	1.572	64	128	192	272	326	399	586	781	977	1953
Nephtys cirrosa	1.676	66	132	198	277	332	399	567	756	945	1890
Nephtys cirrosa	1.781	66	132	198	274	323	392	562	750	937	1875
Nephtys cirrosa	1.886	68	136	204	272	326	396	544	726	907	1814
Nephtys cirrosa	1.991	68	136	204	277	329	389	549	732	915	1829
Nephtys cirrosa	2.096	69	139	209	277	329	389	553	738	922	1844
Nephtys cirrosa	2.200	70	140	211	280	329	392	535	714	892	1784
Nephtys cirrosa	2.305	70	140	211	277	329	385	526	702	877	1755
Nephtys cirrosa	2.410	71	142	213	280	332	385	531	708	885	1769
Nephtys cirrosa	2.515	72	143	215	285	332	385	518	690	863	1726
Nephtys cirrosa	2.619	74	148	222	285	332	385	509	679	848	1697
Nephtys cirrosa	2.724	72	145	217	283	329	382	505	673	841	1683
Nephtys cirrosa	2.829	74	148	222	288	332	389	501	667	834	1668
Nephtys cirrosa	2.934	76	153	229	291	336	385	505	673	841	1683

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Nephtys cirrosa	3.039	74	148	222	288	332	385	496	662	827	1654
Nephtys cirrosa	3.143	75	150	224	288	332	382	505	673	841	1683
Nephtys cirrosa	3.248	76	151	227	291	332	382	492	656	820	1640
Nephtys cirrosa	3.353	77	154	231	291	336	382	496	662	827	1654
Nephtys cirrosa	3.458	77	154	231	294	339	385	492	656	820	1640
Nephtys cirrosa	3.562	77	154	231	291	332	382	496	662	827	1654
Nephtys cirrosa	3.667	77	154	231	294	332	382	484	645	806	1613
Nephtys cirrosa	3.772	78	156	234	291	332	378	484	645	806	1613
Nephtys cirrosa	3.877	79	157	236	291	332	378	484	645	806	1613
Nephtys cirrosa	3.982	79	157	236	294	336	378	472	629	786	1572
Nephtys cirrosa	4.086	80	159	239	297	329	378	480	640	799	1599
Nephtys cirrosa	4.191	79	157	236	297	332	375	472	629	786	1572
Nephtys cirrosa	4.296	80	159	239	297	332	378	468	623	779	1558
Nephtys cirrosa	4.401	80	161	241	297	336	378	476	634	793	1585
Nephtys cirrosa	4.505	81	162	243	297	332	378	472	629	786	1572
Nephtys cirrosa	4.610	81	162	243	299	336	375	472	629	786	1572
Nephtys cirrosa	4.715	82	164	246	299	336	378	472	629	786	1572
Nephtys cirrosa	4.820	80	161	241	299	332	368	464	618	773	1545
Nephtys cirrosa	4.925	81	162	243	299	339	378	472	629	786	1572
Nephtys cirrosa	5.029	81	162	243	299	336	375	468	623	779	1558
Nephtys cirrosa	5.134	80	159	239	299	336	375	460	613	766	1532
Nephtys cirrosa	5.239	82	164	246	299	339	375	464	618	773	1545
Nephtys cirrosa	5.344	82	164	246	302	336	375	456	607	759	1519
Nephtys cirrosa	5.448	83	166	248	302	336	371	448	597	746	1492
Nephtys cirrosa	5.553	84	169	253	305	336	375	464	618	773	1545
Nephtys cirrosa	5.658	84	167	251	305	339	375	452	602	753	1505
Nephtys cirrosa	5.763	83	166	248	305	336	371	452	602	753	1505
Nephtys cirrosa	5.868	83	166	248	302	339	375	460	613	766	1532
Nephtys cirrosa	5.972	84	169	253	305	336	371	456	607	759	1519
Nephtys cirrosa	6.077	84	169	253	305	339	371	452	602	753	1505
Nephtys cirrosa	6.182	84	169	253	305	336	375	456	607	759	1519
Nephtys cirrosa	6.287	84	167	251	305	336	371	452	602	753	1505
Nephtys cirrosa	6.391	85	171	256	302	336	371	452	602	753	1505
Nephtys cirrosa	6.496	83	166	248	305	336	371	444	592	740	1479
Nephtys cirrosa	6.601	84	169	253	305	336	368	444	592	740	1479
Nephtys cirrosa	6.706	84	169	253	305	336	371	452	602	753	1505
Nephtys cirrosa	6.811	84	169	253	305	336	368	444	592	740	1479
Nephtys cirrosa	6.915	87	174	261	305	339	371	440	587	733	1467
Nephtys cirrosa	7.020	86	172	259	305	336	371	440	587	733	1467
Nephtys cirrosa	7.125	85	171	256	308	339	371	448	597	746	1492
Nephtys cirrosa	7.230	85	171	256	308	336	371	440	587	733	1467
Nephtys cirrosa	7.334	87	174	261	305	336	368	440	587	733	1467
Nephtys cirrosa	7.439	87	174	261	305	336	368	440	587	733	1467
Nephtys cirrosa	7.544	88	176	264	308	339	368	432	576	721	1441
Nephtys cirrosa	7.649	87	174	261	308	339	368	436	582	727	1454
Nephtys cirrosa	7.754	88	176	264	311	339	371	440	587	733	1467
Nephtys cirrosa	7.858	88	176	264	308	336	368	440	587	733	1467
Nephtys cirrosa	7.963	87	174	261	305	336	368	432	576	721	1441
Nephtys cirrosa	8.068	89	178	266	311	339	371	440	587	733	1467
Nephtys cirrosa	8.173	88	176	264	308	336	368	429	571	714	1429
Nephtys cirrosa	8.277	88	176	264	308	336	368	432	576	721	1441
Nephtys cirrosa	8.382	89	178	266	314	339	365	429	571	714	1429
Nephtys cirrosa	8.487	88	176	264	308	336	365	429	571	714	1429
Nephtys cirrosa	8.592	87	174	261	311	339	365	429	571	714	1429
Nephtys cirrosa	8.697	90	179	269	311	339	371	432	576	721	1441
Nephtys cirrosa	8.801	90	179	269	311	339	365	429	571	714	1429
Nephtys cirrosa	8.906	89	178	266	308	336	365	429	571	714	1429
Nephtys cirrosa	9.011	90	179	269	311	339	368	436	582	727	1454
Nephtys cirrosa	9.116	89	178	266	311	339	368	432	576	721	1441
Nephtys cirrosa	9.220	89	178	266	308	336	365	429	571	714	1429
Nephtys cirrosa	9.325	89	178	266	311	339	365	425	566	708	1416
Nephtys cirrosa	9.430	90	179	269	311	336	368	432	576	721	1441
Nephtys cirrosa	9.535	90	179	269	314	339	368	425	566	708	1416
Nephtys cirrosa	9.640	90	179	269	311	339	365	425	566	708	1416
Nephtys cirrosa	9.744	91	183	274	314	339	365	429	571	714	1429
Nephtys cirrosa	9.849	89	178	266	311	339	365	421	561	702	1404
Nephtys cirrosa	9.954	91	181	272	314	339	368	425	566	708	1416
Nephtys cirrosa	10.059	90	179	269	314	339	368	429	571	714	1429
Nephtys cirrosa	10.163	91	181	272	311	336	368	429	571	714	1429
Nephtys cirrosa	10.268	91	181	272	311	339	365	421	561	702	1404
Nephtys cirrosa	10.373	91	183	274	311	336	365	421	561	702	1404
Nephtys cirrosa	10.478	91	181	272	314	339	365	425	566	708	1416
Nephtys cirrosa	10.583	91	183	274	314	339	365	421	561	702	1404
Nephtys cirrosa	10.687	90	179	269	311	339	365	421	561	702	1404
Nephtys cirrosa	10.792	91	183	274	314	339	365	425	566	708	1416
Nephtys cirrosa	10.897	91	183	274	314	339	365	421	561	702	1404
Nephtys cirrosa	11.002	91	183	274	314	339	365	421	561	702	1404
Nephtys cirrosa	11.106	91	181	272	314	339	365	421	561	702	1404
Nephtys cirrosa	11.211	91	183	274	314	336	365	417	557	696	1391
Nephtys cirrosa	11.316	91	183	274	314	339	365	421	561	702	1404
Nephtys cirrosa	11.421	91	181	272	314	339	365	421	561	702	1404
Nephtys cirrosa	11.526	91	181	272	314	339	365	417	557	696	1391
Nephtys cirrosa	11.630	91	183	274	314	339	365	417	557	696	1391
Nephtys cirrosa	11.735	91	183	274	314	336	365	417	557	696	1391
Nephtys cirrosa	11.840	92	185	277	317	339	361	417	557	696	1391
Nephtys cirrosa	11.945	93	187	280	317	339	365	417	557	696	1391
Nephtys cirrosa	12.049	93	187	280	317	339	361	414	552	690	1379
Nephtys cirrosa	12.154	91	183	274	314	339	361	421	561	702	1404
Nephtys cirrosa	12.259	92	185	277	317	339	361	410	547	683	1367
Nephtys cirrosa	12.364	92	185	277	317	339	365	417	557	696	1391
Nephtys cirrosa	12.469	93	187	280	314	339	361	410	547	683	1367
Nephtys cirrosa	12.573	92	185	277	317	339	361	414	552	690	1379
Nephtys cirrosa	12.678	92	185	277	314	339	361	414	552	690	1379
Nephtys cirrosa	12.783	92	185	277	314	339	365	417	557	696	1391
Nephtys cirrosa	12.888	92	185	277	314	339	365	417	557	696	1391
Nephtys cirrosa	12.992	93	187	280	317	339	361	414	552	690	1379

Habitat	sampling surface	Poor min	Mod min	Good min	High min	Median	High max	Good max	Mod max	Poor max	Bad max
Nephtys cirrosa	13.097	92	185	277	317	339	361	410	547	683	1367
Nephtys cirrosa	13.202	93	187	280	317	339	361	414	552	690	1379
Nephtys cirrosa	13.307	92	185	277	317	339	361	417	557	696	1391
Nephtys cirrosa	13.412	93	187	280	317	339	361	414	552	690	1379
Nephtys cirrosa	13.516	93	187	280	317	339	365	414	552	690	1379
Nephtys cirrosa	13.621	92	185	277	317	339	361	410	547	683	1367
Nephtys cirrosa	13.726	94	188	283	317	339	361	410	547	683	1367
Nephtys cirrosa	13.831	94	188	283	317	339	361	410	547	683	1367
Nephtys cirrosa	13.935	93	187	280	317	339	365	406	542	677	1355
Nephtys cirrosa	14.040	93	187	280	317	339	361	403	537	671	1343
Nephtys cirrosa	14.145	94	188	283	317	339	361	410	547	683	1367
Nephtys cirrosa	14.250	93	187	280	317	339	358	410	547	683	1367
Nephtys cirrosa	14.355	93	187	280	317	339	361	406	542	677	1355
Nephtys cirrosa	14.459	92	185	277	317	339	361	410	547	683	1367
Nephtys cirrosa	14.564	92	185	277	317	339	361	414	552	690	1379
Nephtys cirrosa	14.669	93	187	280	317	339	361	410	547	683	1367
Nephtys cirrosa	14.774	94	188	283	320	339	365	406	542	677	1355
Nephtys cirrosa	14.878	94	188	283	317	339	361	410	547	683	1367
Nephtys cirrosa	14.983	94	188	283	317	339	361	406	542	677	1355
Nephtys cirrosa	15.088	95	190	285	317	339	361	406	542	677	1355
Nephtys cirrosa	15.193	93	187	280	317	339	358	406	542	677	1355
Nephtys cirrosa	15.298	94	188	283	317	339	361	406	542	677	1355
Nephtys cirrosa	15.402	94	188	283	317	339	361	410	547	683	1367
Nephtys cirrosa	15.507	93	187	280	317	339	361	406	542	677	1355
Nephtys cirrosa	15.612	94	188	283	317	339	361	406	542	677	1355
Nephtys cirrosa	15.717	96	192	288	317	339	361	403	537	671	1343
Nephtys cirrosa	15.821	95	190	285	317	339	361	406	542	677	1355
Nephtys cirrosa	15.926	94	188	283	317	339	361	410	547	683	1367
Nephtys cirrosa	16.031	94	188	283	320	339	361	406	542	677	1355
Nephtys cirrosa	16.136	95	190	285	317	339	358	406	542	677	1355
Nephtys cirrosa	16.241	94	188	283	317	339	358	406	542	677	1355
Nephtys cirrosa	16.345	96	192	288	320	339	361	403	537	671	1343
Nephtys cirrosa	16.450	94	188	283	320	339	361	403	537	671	1343
Nephtys cirrosa	16.555	95	190	285	320	339	361	406	542	677	1355
Nephtys cirrosa	16.660	94	188	283	320	339	361	406	542	677	1355
Nephtys cirrosa	16.764	95	190	285	317	339	361	406	542	677	1355
Nephtys cirrosa	16.869	94	188	283	317	339	361	406	542	677	1355
Nephtys cirrosa	16.974	95	190	285	320	339	358	403	537	671	1343
Nephtys cirrosa	17.079	95	190	285	320	339	358	403	537	671	1343
Nephtys cirrosa	17.184	95	190	285	320	339	358	403	537	671	1343
Nephtys cirrosa	17.288	96	192	288	320	339	358	403	537	671	1343
Nephtys cirrosa	17.393	96	192	288	320	339	358	403	537	671	1343
Nephtys cirrosa	17.498	96	192	288	320	339	361	403	537	671	1343
Nephtys cirrosa	17.603	96	192	288	320	339	361	403	537	671	1343
Nephtys cirrosa	17.707	95	190	285	320	339	358	403	537	671	1343
Nephtys cirrosa	17.812	96	192	288	320	339	361	403	537	671	1343
Nephtys cirrosa	17.917	95	190	285	320	339	361	403	537	671	1343
Nephtys cirrosa	18.022	95	190	285	320	339	358	406	542	677	1355
Nephtys cirrosa	18.127	95	190	285	320	339	358	403	537	671	1343
Nephtys cirrosa	18.231	96	192	288	320	339	358	403	537	671	1343
Nephtys cirrosa	18.336	95	190	285	320	339	361	403	537	671	1343
Nephtys cirrosa	18.441	96	192	288	320	339	358	406	542	677	1355
Nephtys cirrosa	18.546	96	192	288	320	339	358	399	532	665	1331
Nephtys cirrosa	18.650	95	190	285	320	339	358	403	537	671	1343
Nephtys cirrosa	18.755	96	192	288	320	339	358	399	532	665	1331
Nephtys cirrosa	18.860	94	188	283	320	339	358	399	532	665	1331
Nephtys cirrosa	18.965	97	194	291	320	339	358	399	532	665	1331
Nephtys cirrosa	19.070	96	192	288	320	339	358	399	532	665	1331
Nephtys cirrosa	19.174	95	190	285	320	339	358	399	532	665	1331
Nephtys cirrosa	19.279	96	192	288	320	339	358	403	537	671	1343
Nephtys cirrosa	19.384	96	192	288	320	339	358	403	537	671	1343
Nephtys cirrosa	19.489	96	192	288	320	339	358	396	528	659	1319

NUMBER OF SPECIES / SIMILARITY

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Abra alba	0.103	3	6	9	23	0.06	0.11	0.17	0.39
Abra alba	0.205	7	14	21	37	0.12	0.23	0.35	0.54
Abra alba	0.308	10	20	30	46	0.15	0.29	0.44	0.61
Abra alba	0.411	12	25	37	52	0.17	0.34	0.51	0.65
Abra alba	0.514	14	29	43	57	0.19	0.37	0.56	0.69
Abra alba	0.616	16	31	47	60	0.20	0.40	0.60	0.71
Abra alba	0.719	17	34	51	64	0.21	0.42	0.63	0.72
Abra alba	0.822	18	36	54	66	0.22	0.43	0.65	0.74
Abra alba	0.924	19	38	57	69	0.23	0.45	0.68	0.75
Abra alba	1.027	20	40	60	71	0.23	0.46	0.69	0.76
Abra alba	1.130	21	41	62	73	0.24	0.47	0.71	0.78
Abra alba	1.233	22	43	65	75	0.24	0.48	0.72	0.78
Abra alba	1.335	22	44	66	76	0.24	0.49	0.73	0.79
Abra alba	1.438	23	45	68	78	0.25	0.49	0.74	0.80
Abra alba	1.541	23	46	69	79	0.25	0.50	0.75	0.80
Abra alba	1.643	23	47	70	80	0.25	0.51	0.76	0.81
Abra alba	1.746	24	48	72	82	0.25	0.51	0.76	0.81
Abra alba	1.849	25	49	74	83	0.26	0.51	0.77	0.82
Abra alba	1.952	25	49	74	84	0.26	0.51	0.77	0.82
Abra alba	2.054	25	51	76	85	0.26	0.52	0.78	0.82
Abra alba	2.157	26	51	77	86	0.26	0.53	0.79	0.83
Abra alba	2.260	26	52	78	87	0.26	0.53	0.79	0.83
Abra alba	2.362	26	52	78	88	0.26	0.53	0.79	0.84
Abra alba	2.465	27	53	80	89	0.27	0.53	0.80	0.84
Abra alba	2.568	27	54	81	89	0.27	0.53	0.80	0.84
Abra alba	2.671	27	54	81	90	0.27	0.54	0.81	0.84
Abra alba	2.773	27	55	82	91	0.27	0.54	0.81	0.85
Abra alba	2.876	27	55	82	91	0.27	0.54	0.81	0.85
Abra alba	2.979	28	55	83	92	0.27	0.55	0.82	0.85
Abra alba	3.081	28	56	84	93	0.27	0.55	0.82	0.85
Abra alba	3.184	28	57	85	94	0.27	0.55	0.82	0.86
Abra alba	3.287	28	57	85	94	0.27	0.55	0.82	0.86
Abra alba	3.390	29	57	86	95	0.28	0.55	0.83	0.86
Abra alba	3.492	29	58	87	96	0.28	0.55	0.83	0.86
Abra alba	3.595	29	59	88	96	0.28	0.55	0.83	0.86
Abra alba	3.698	30	59	89	97	0.28	0.55	0.83	0.87
Abra alba	3.800	30	59	89	97	0.28	0.56	0.84	0.87
Abra alba	3.903	30	60	90	98	0.28	0.56	0.84	0.87
Abra alba	4.006	30	60	90	99	0.28	0.56	0.84	0.87
Abra alba	4.109	30	61	91	99	0.28	0.56	0.84	0.87
Abra alba	4.211	30	61	91	100	0.28	0.57	0.85	0.87
Abra alba	4.314	31	61	92	100	0.28	0.57	0.85	0.88
Abra alba	4.417	31	61	92	100	0.28	0.57	0.85	0.88
Abra alba	4.519	31	62	93	101	0.28	0.57	0.85	0.88
Abra alba	4.622	31	62	93	101	0.28	0.57	0.85	0.88
Abra alba	4.725	31	63	94	102	0.28	0.57	0.85	0.88
Abra alba	4.828	31	63	94	102	0.29	0.57	0.86	0.88
Abra alba	4.930	31	63	94	103	0.29	0.57	0.86	0.88
Abra alba	5.033	32	63	95	103	0.29	0.57	0.86	0.88
Abra alba	5.136	32	64	96	104	0.29	0.57	0.86	0.89
Abra alba	5.238	32	65	97	104	0.29	0.57	0.86	0.89
Abra alba	5.341	32	64	96	105	0.29	0.57	0.86	0.89
Abra alba	5.444	32	65	97	105	0.29	0.57	0.86	0.89
Abra alba	5.547	32	65	98	105	0.29	0.58	0.87	0.89
Abra alba	5.649	33	65	98	106	0.29	0.58	0.87	0.89
Abra alba	5.752	33	65	98	106	0.29	0.58	0.87	0.89
Abra alba	5.855	33	66	99	106	0.29	0.58	0.87	0.89
Abra alba	5.957	33	66	99	107	0.29	0.58	0.87	0.89
Abra alba	6.060	33	66	99	107	0.29	0.58	0.87	0.89
Abra alba	6.163	33	67	100	108	0.29	0.58	0.87	0.90
Abra alba	6.266	33	67	100	108	0.29	0.58	0.87	0.90
Abra alba	6.368	33	67	100	108	0.29	0.58	0.87	0.90
Abra alba	6.471	34	67	101	108	0.29	0.59	0.88	0.90
Abra alba	6.574	34	67	101	109	0.29	0.59	0.88	0.90
Abra alba	6.676	34	67	101	109	0.29	0.59	0.88	0.90
Abra alba	6.779	34	67	101	109	0.29	0.59	0.88	0.90
Abra alba	6.882	34	68	102	110	0.29	0.59	0.88	0.90
Abra alba	6.985	34	68	102	110	0.29	0.59	0.88	0.90
Abra alba	7.087	34	69	103	110	0.29	0.59	0.88	0.90
Abra alba	7.190	34	69	103	111	0.29	0.59	0.88	0.90
Abra alba	7.293	34	69	103	111	0.29	0.59	0.88	0.90
Abra alba	7.395	35	69	104	111	0.30	0.59	0.89	0.90
Abra alba	7.498	35	69	104	111	0.30	0.59	0.89	0.91
Abra alba	7.601	35	69	104	112	0.30	0.59	0.89	0.91
Abra alba	7.704	35	69	104	112	0.30	0.59	0.89	0.91
Abra alba	7.806	35	70	105	112	0.30	0.59	0.89	0.91
Abra alba	7.909	35	70	105	113	0.30	0.59	0.89	0.91
Abra alba	8.012	35	70	105	113	0.30	0.59	0.89	0.91
Abra alba	8.114	35	71	106	113	0.30	0.59	0.89	0.91
Abra alba	8.217	35	71	106	113	0.30	0.59	0.89	0.91
Abra alba	8.320	35	71	106	113	0.30	0.59	0.89	0.91
Abra alba	8.423	35	71	106	114	0.30	0.59	0.89	0.91
Abra alba	8.525	35	71	106	114	0.30	0.59	0.89	0.91
Abra alba	8.628	36	71	107	114	0.30	0.59	0.89	0.91
Abra alba	8.731	36	71	107	114	0.30	0.60	0.90	0.91
Abra alba	8.833	36	71	107	114	0.30	0.60	0.90	0.91
Abra alba	8.936	36	72	108	115	0.30	0.60	0.90	0.91

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Abra alba	9.039	36	72	108	115	0.30	0.60	0.90	0.91
Abra alba	9.142	36	72	108	115	0.30	0.60	0.90	0.92
Abra alba	9.244	36	72	108	115	0.30	0.60	0.90	0.92
Abra alba	9.347	36	73	109	116	0.30	0.60	0.90	0.92
Abra alba	9.450	36	73	109	116	0.30	0.60	0.90	0.92
Abra alba	9.552	36	73	109	116	0.30	0.60	0.90	0.92
Abra alba	9.655	36	73	109	117	0.30	0.60	0.90	0.92
Abra alba	9.758	36	73	109	116	0.30	0.60	0.90	0.92
Abra alba	9.861	37	73	110	117	0.30	0.60	0.90	0.92
Abra alba	9.963	37	73	110	117	0.30	0.60	0.90	0.92
Abra alba	10.066	37	73	110	117	0.30	0.60	0.90	0.92
Abra alba	10.169	37	73	110	117	0.30	0.60	0.90	0.92
Abra alba	10.271	37	73	110	118	0.30	0.60	0.90	0.92
Abra alba	10.374	37	74	111	118	0.30	0.60	0.90	0.92
Abra alba	10.477	37	73	110	118	0.30	0.60	0.90	0.92
Abra alba	10.580	37	74	111	118	0.30	0.61	0.91	0.92
Abra alba	10.682	37	74	111	118	0.30	0.61	0.91	0.92
Abra alba	10.785	37	74	111	119	0.30	0.61	0.91	0.92
Abra alba	10.888	37	75	112	119	0.30	0.61	0.91	0.92
Abra alba	10.990	37	75	112	119	0.30	0.61	0.91	0.92
Abra alba	11.093	37	75	112	119	0.30	0.61	0.91	0.92
Abra alba	11.196	37	75	112	119	0.30	0.61	0.91	0.92
Abra alba	11.299	37	75	112	119	0.30	0.61	0.91	0.92
Abra alba	11.401	38	75	113	120	0.30	0.61	0.91	0.93
Abra alba	11.504	38	75	113	120	0.30	0.61	0.91	0.93
Abra alba	11.607	38	75	113	120	0.30	0.61	0.91	0.93
Abra alba	11.709	38	75	113	120	0.30	0.61	0.91	0.93
Abra alba	11.812	38	75	113	120	0.30	0.61	0.91	0.93
Abra alba	11.915	38	76	114	121	0.30	0.61	0.91	0.93
Abra alba	12.018	38	75	113	121	0.30	0.61	0.91	0.93
Abra alba	12.120	38	76	114	121	0.30	0.61	0.91	0.93
Abra alba	12.223	38	76	114	121	0.30	0.61	0.91	0.93
Abra alba	12.326	38	76	114	121	0.30	0.61	0.91	0.93
Abra alba	12.428	38	76	114	121	0.30	0.61	0.91	0.93
Abra alba	12.531	38	76	114	121	0.30	0.61	0.91	0.93
Abra alba	12.634	38	77	115	122	0.31	0.61	0.92	0.93
Abra alba	12.737	38	77	115	122	0.31	0.61	0.92	0.93
Abra alba	12.839	38	77	115	122	0.31	0.61	0.92	0.93
Abra alba	12.942	38	77	115	122	0.31	0.61	0.92	0.93
Abra alba	13.045	38	77	115	122	0.31	0.61	0.92	0.93
Abra alba	13.147	38	77	115	122	0.31	0.61	0.92	0.93
Abra alba	13.250	38	77	115	123	0.31	0.61	0.92	0.93
Abra alba	13.353	39	77	116	123	0.31	0.61	0.92	0.93
Abra alba	13.456	39	77	116	123	0.31	0.61	0.92	0.93
Abra alba	13.558	39	77	116	123	0.31	0.61	0.92	0.93
Abra alba	13.661	39	77	116	123	0.31	0.61	0.92	0.93
Abra alba	13.764	39	77	116	123	0.31	0.61	0.92	0.93
Abra alba	13.866	39	77	116	123	0.31	0.61	0.92	0.93
Abra alba	13.969	39	78	117	123	0.31	0.61	0.92	0.93
Abra alba	14.072	39	78	117	124	0.31	0.61	0.92	0.93
Abra alba	14.175	39	78	117	124	0.31	0.61	0.92	0.93
Abra alba	14.277	39	78	117	124	0.31	0.61	0.92	0.94
Abra alba	14.380	39	78	117	124	0.31	0.61	0.92	0.94
Abra alba	14.483	39	78	117	124	0.31	0.61	0.92	0.94
Abra alba	14.585	39	78	117	124	0.31	0.61	0.92	0.94
Abra alba	14.688	39	78	117	125	0.31	0.61	0.92	0.94
Abra alba	14.791	39	79	118	125	0.31	0.61	0.92	0.94
Abra alba	14.894	39	79	118	125	0.31	0.61	0.92	0.94
Abra alba	14.996	39	79	118	125	0.31	0.61	0.92	0.94
Abra alba	15.099	39	79	118	125	0.31	0.61	0.92	0.94
Abra alba	15.202	39	79	118	125	0.31	0.61	0.92	0.94
Abra alba	15.304	39	79	118	125	0.31	0.61	0.92	0.94
Abra alba	15.407	40	79	119	125	0.31	0.62	0.93	0.94
Abra alba	15.510	40	79	119	125	0.31	0.62	0.93	0.94
Abra alba	15.613	39	79	118	125	0.31	0.62	0.93	0.94
Abra alba	15.715	40	79	119	125	0.31	0.61	0.92	0.94
Abra alba	15.818	40	79	119	126	0.31	0.62	0.93	0.94
Abra alba	15.921	40	79	119	126	0.31	0.62	0.93	0.94
Abra alba	16.023	40	79	119	126	0.31	0.62	0.93	0.94
Abra alba	16.126	40	79	119	126	0.31	0.62	0.93	0.94
Abra alba	16.229	40	79	119	126	0.31	0.62	0.93	0.94
Abra alba	16.332	40	79	119	126	0.31	0.62	0.93	0.94
Abra alba	16.434	40	80	120	126	0.31	0.62	0.93	0.94
Abra alba	16.537	40	80	120	127	0.31	0.62	0.93	0.94
Abra alba	16.640	40	80	120	127	0.31	0.62	0.93	0.94
Abra alba	16.742	40	80	120	127	0.31	0.62	0.93	0.94
Abra alba	16.845	40	80	120	127	0.31	0.62	0.93	0.94
Abra alba	16.948	40	80	120	127	0.31	0.62	0.93	0.94
Abra alba	17.051	40	81	121	127	0.31	0.62	0.93	0.94
Abra alba	17.153	40	81	121	127	0.31	0.62	0.93	0.94
Abra alba	17.256	40	81	121	127	0.31	0.62	0.93	0.94
Abra alba	17.359	40	81	121	127	0.31	0.62	0.93	0.94
Abra alba	17.461	40	81	121	127	0.31	0.62	0.93	0.94
Abra alba	17.564	40	81	121	127	0.31	0.62	0.93	0.94
Abra alba	17.667	40	81	121	128	0.31	0.62	0.93	0.94
Abra alba	17.770	40	81	121	128	0.31	0.62	0.93	0.94
Abra alba	17.872	40	81	121	128	0.31	0.62	0.93	0.94
Abra alba	17.975	41	81	122	128	0.31	0.62	0.93	0.94

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Abra alba	18.078	41	81	122	128	0.31	0.62	0.93	0.94
Abra alba	18.180	41	81	122	128	0.31	0.62	0.93	0.94
Abra alba	18.283	41	81	122	128	0.31	0.62	0.93	0.94
Abra alba	18.386	41	81	122	128	0.31	0.62	0.93	0.95
Abra alba	18.489	41	81	122	128	0.31	0.62	0.93	0.94
Abra alba	18.591	41	81	122	128	0.31	0.62	0.93	0.95
Abra alba	18.694	41	81	122	129	0.31	0.62	0.93	0.95
Abra alba	18.797	41	82	123	129	0.31	0.62	0.93	0.95
Abra alba	18.899	41	81	122	129	0.31	0.62	0.93	0.95
Abra alba	19.002	41	81	122	129	0.31	0.62	0.93	0.95
Abra alba	19.105	41	82	123	129	0.31	0.62	0.93	0.95
Abra alba	19.208	41	82	123	129	0.31	0.62	0.93	0.95
Abra alba	19.310	41	82	123	129	0.31	0.62	0.93	0.95
Abra alba	19.413	41	82	123	129	0.31	0.63	0.94	0.95
Abra alba	19.516	41	82	123	129	0.31	0.63	0.94	0.95
Abra alba	19.618	41	82	123	129	0.31	0.63	0.94	0.95
Abra alba	19.721	41	82	123	129	0.31	0.63	0.94	0.95
Abra alba	19.824	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	19.927	41	82	123	130	0.31	0.63	0.94	0.95
Abra alba	20.029	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.132	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.235	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.337	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.440	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.543	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.646	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.748	41	83	124	130	0.31	0.63	0.94	0.95
Abra alba	20.851	41	83	124	131	0.31	0.63	0.94	0.95
Abra alba	20.954	41	83	124	131	0.31	0.63	0.94	0.95
Abra alba	21.056	41	83	124	131	0.31	0.63	0.94	0.95
Abra alba	21.159	41	83	124	131	0.31	0.63	0.94	0.95
Abra alba	21.262	41	83	124	131	0.31	0.63	0.94	0.95
Abra alba	21.365	41	83	124	131	0.31	0.63	0.94	0.95
Abra alba	21.467	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	21.570	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	21.673	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	21.775	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	21.878	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	21.981	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	22.084	42	83	125	131	0.31	0.63	0.94	0.95
Abra alba	22.186	42	83	125	132	0.31	0.63	0.94	0.95
Abra alba	22.289	42	84	126	131	0.31	0.63	0.94	0.95
Abra alba	22.392	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	22.494	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	22.597	42	84	126	131	0.31	0.63	0.94	0.95
Abra alba	22.700	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	22.803	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	22.905	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.008	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.111	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.213	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.316	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.419	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.522	42	84	126	133	0.31	0.63	0.94	0.95
Abra alba	23.624	42	84	126	132	0.31	0.63	0.94	0.95
Abra alba	23.727	42	85	127	132	0.31	0.63	0.94	0.95
Abra alba	23.830	42	85	127	132	0.31	0.63	0.94	0.95
Abra alba	23.932	42	85	127	133	0.31	0.63	0.94	0.95
Abra alba	24.035	42	85	127	133	0.31	0.63	0.94	0.95
Abra alba	24.138	42	85	127	133	0.31	0.63	0.94	0.95
Abra alba	24.241	42	85	127	133	0.31	0.63	0.94	0.95
Abra alba	24.343	42	85	127	133	0.31	0.63	0.94	0.95
Abra alba	24.446	42	85	127	133	0.31	0.63	0.94	0.95
Abra alba	24.549	42	85	127	133	0.31	0.63	0.94	0.96
Abra alba	24.651	42	85	127	133	0.31	0.63	0.94	0.96
Abra alba	24.754	42	85	127	133	0.31	0.63	0.94	0.96
Abra alba	24.857	42	85	127	133	0.32	0.63	0.95	0.96
Abra alba	24.960	42	85	127	133	0.32	0.63	0.95	0.96
Abra alba	25.062	42	85	127	133	0.32	0.63	0.95	0.96
Abra alba	25.165	43	85	128	133	0.32	0.63	0.95	0.96
Abra alba	25.268	42	85	127	133	0.32	0.63	0.95	0.96
Abra alba	25.370	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	25.473	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	25.576	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	25.679	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	25.781	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	25.884	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	25.987	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.089	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.192	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.295	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.398	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.500	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.603	43	85	128	134	0.32	0.63	0.95	0.96
Abra alba	26.706	43	86	129	134	0.32	0.63	0.95	0.96
Abra alba	26.808	43	86	129	134	0.32	0.63	0.95	0.96
Abra alba	26.911	43	86	129	134	0.32	0.63	0.95	0.96
Abra alba	27.014	43	86	129	134	0.32	0.63	0.95	0.96
Abra alba	27.117	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.219	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.322	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.425	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.527	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.630	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.733	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.836	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	27.938	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	28.041	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	28.144	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	28.246	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	28.349	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	28.452	43	86	129	135	0.32	0.63	0.95	0.96
Abra alba	28.555	43	87	130	135	0.32	0.63	0.95	0.96

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Macoma balthica	0.102	1	1	2	7	0.03	0.05	0.08	0.19
Macoma balthica	0.203	2	4	6	12	0.06	0.12	0.18	0.32
Macoma balthica	0.305	3	6	9	17	0.09	0.17	0.26	0.39
Macoma balthica	0.406	4	9	13	21	0.11	0.21	0.32	0.45
Macoma balthica	0.508	5	10	15	24	0.12	0.25	0.37	0.49
Macoma balthica	0.609	6	12	18	27	0.14	0.27	0.41	0.53
Macoma balthica	0.711	7	13	20	29	0.15	0.29	0.44	0.56
Macoma balthica	0.813	7	15	22	31	0.16	0.31	0.47	0.58
Macoma balthica	0.914	8	16	24	33	0.16	0.33	0.49	0.61
Macoma balthica	1.016	9	18	27	36	0.17	0.35	0.52	0.63
Macoma balthica	1.117	9	19	28	37	0.18	0.35	0.53	0.65
Macoma balthica	1.219	10	19	29	39	0.18	0.37	0.55	0.66
Macoma balthica	1.320	10	21	31	40	0.19	0.38	0.57	0.67
Macoma balthica	1.422	11	22	33	42	0.20	0.39	0.59	0.68
Macoma balthica	1.523	11	23	34	43	0.20	0.40	0.60	0.70
Macoma balthica	1.625	12	23	35	44	0.20	0.41	0.61	0.70
Macoma balthica	1.727	12	24	36	45	0.21	0.41	0.62	0.71
Macoma balthica	1.828	13	25	38	46	0.21	0.42	0.63	0.72
Macoma balthica	1.930	13	26	39	47	0.21	0.43	0.64	0.73
Macoma balthica	2.031	13	27	40	48	0.22	0.43	0.65	0.74
Macoma balthica	2.133	13	27	40	49	0.22	0.44	0.66	0.74
Macoma balthica	2.234	14	28	42	50	0.22	0.45	0.67	0.75
Macoma balthica	2.336	14	28	42	51	0.22	0.45	0.67	0.76
Macoma balthica	2.438	15	29	44	51	0.23	0.46	0.69	0.76
Macoma balthica	2.539	15	29	44	52	0.23	0.46	0.69	0.77
Macoma balthica	2.641	15	30	45	53	0.23	0.46	0.69	0.77
Macoma balthica	2.742	15	31	46	53	0.24	0.47	0.71	0.78
Macoma balthica	2.844	15	31	46	54	0.24	0.47	0.71	0.78
Macoma balthica	2.945	16	31	47	55	0.24	0.47	0.71	0.79
Macoma balthica	3.047	16	32	48	55	0.24	0.48	0.72	0.79
Macoma balthica	3.149	16	32	48	56	0.24	0.49	0.73	0.79
Macoma balthica	3.250	16	33	49	56	0.24	0.49	0.73	0.79
Macoma balthica	3.352	16	33	49	57	0.24	0.49	0.73	0.80
Macoma balthica	3.453	17	33	50	58	0.25	0.49	0.74	0.80
Macoma balthica	3.555	17	33	50	58	0.25	0.49	0.74	0.80
Macoma balthica	3.656	17	34	51	58	0.25	0.50	0.75	0.81
Macoma balthica	3.758	17	35	52	59	0.25	0.50	0.75	0.81
Macoma balthica	3.860	17	35	52	59	0.25	0.51	0.76	0.81
Macoma balthica	3.961	17	35	52	60	0.25	0.51	0.76	0.82
Macoma balthica	4.063	18	35	53	60	0.26	0.51	0.77	0.82
Macoma balthica	4.164	18	35	53	61	0.26	0.51	0.77	0.82
Macoma balthica	4.266	18	35	53	61	0.26	0.51	0.77	0.82
Macoma balthica	4.367	18	36	54	61	0.26	0.51	0.77	0.83
Macoma balthica	4.469	18	37	55	61	0.26	0.52	0.78	0.83
Macoma balthica	4.570	18	36	54	62	0.26	0.52	0.78	0.83
Macoma balthica	4.672	18	37	55	62	0.26	0.53	0.79	0.83
Macoma balthica	4.774	19	37	56	62	0.26	0.53	0.79	0.83
Macoma balthica	4.875	19	37	56	63	0.26	0.53	0.79	0.84
Macoma balthica	4.977	19	37	56	63	0.26	0.53	0.79	0.84
Macoma balthica	5.078	19	38	57	64	0.26	0.53	0.79	0.84
Macoma balthica	5.180	19	38	57	64	0.27	0.53	0.80	0.84
Macoma balthica	5.281	19	39	58	64	0.27	0.53	0.80	0.84
Macoma balthica	5.383	19	39	58	64	0.27	0.53	0.80	0.85
Macoma balthica	5.485	19	39	58	65	0.27	0.54	0.81	0.85
Macoma balthica	5.586	19	39	58	65	0.27	0.54	0.81	0.85
Macoma balthica	5.688	19	39	58	66	0.27	0.54	0.81	0.85
Macoma balthica	5.789	20	39	59	66	0.27	0.54	0.81	0.85
Macoma balthica	5.891	20	39	59	66	0.27	0.54	0.81	0.86
Macoma balthica	5.992	20	39	59	66	0.27	0.55	0.82	0.86
Macoma balthica	6.094	20	40	60	67	0.27	0.55	0.82	0.86
Macoma balthica	6.196	20	40	60	67	0.27	0.55	0.82	0.86
Macoma balthica	6.297	20	41	61	67	0.27	0.55	0.82	0.86
Macoma balthica	6.399	20	41	61	67	0.27	0.55	0.82	0.86
Macoma balthica	6.500	20	41	61	68	0.28	0.55	0.83	0.86
Macoma balthica	6.602	20	41	61	68	0.28	0.55	0.83	0.87
Macoma balthica	6.703	20	41	61	68	0.28	0.55	0.83	0.87
Macoma balthica	6.805	21	41	62	68	0.28	0.55	0.83	0.87
Macoma balthica	6.906	21	41	62	68	0.28	0.55	0.83	0.87
Macoma balthica	7.008	21	41	62	69	0.28	0.55	0.83	0.87
Macoma balthica	7.110	21	41	62	69	0.28	0.56	0.84	0.87
Macoma balthica	7.211	21	42	63	69	0.28	0.56	0.84	0.87
Macoma balthica	7.313	21	42	63	69	0.28	0.56	0.84	0.87
Macoma balthica	7.414	21	42	63	69	0.28	0.56	0.84	0.88
Macoma balthica	7.516	21	42	63	70	0.28	0.56	0.84	0.88
Macoma balthica	7.617	21	43	64	70	0.28	0.56	0.84	0.88
Macoma balthica	7.719	21	43	64	70	0.28	0.57	0.85	0.88
Macoma balthica	7.821	21	43	64	70	0.28	0.56	0.84	0.88
Macoma balthica	7.922	21	43	64	71	0.28	0.57	0.85	0.88
Macoma balthica	8.024	22	43	65	71	0.28	0.57	0.85	0.88
Macoma balthica	8.125	22	43	65	71	0.28	0.57	0.85	0.88
Macoma balthica	8.227	22	43	65	71	0.28	0.57	0.85	0.89
Macoma balthica	8.328	22	43	65	71	0.28	0.57	0.85	0.89
Macoma balthica	8.430	22	43	65	72	0.28	0.57	0.85	0.89
Macoma balthica	8.532	22	43	65	72	0.29	0.57	0.86	0.89
Macoma balthica	8.633	22	44	66	72	0.29	0.57	0.86	0.89
Macoma balthica	8.735	22	44	66	72	0.29	0.57	0.86	0.89
Macoma balthica	8.836	22	44	66	72	0.29	0.57	0.86	0.89
Macoma balthica	8.938	22	44	66	73	0.29	0.57	0.86	0.89

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Macoma balthica	9.039	22	44	66	73	0.29	0.57	0.86	0.89
Macoma balthica	9.141	22	44	66	73	0.29	0.57	0.86	0.89
Macoma balthica	9.243	22	45	67	73	0.29	0.57	0.86	0.89
Macoma balthica	9.344	22	45	67	73	0.29	0.57	0.86	0.89
Macoma balthica	9.446	22	45	67	73	0.29	0.57	0.86	0.90
Macoma balthica	9.547	22	45	67	73	0.29	0.57	0.86	0.90
Macoma balthica	9.649	23	45	68	74	0.29	0.58	0.87	0.90
Macoma balthica	9.750	23	45	68	74	0.29	0.58	0.87	0.90
Macoma balthica	9.852	23	45	68	74	0.29	0.58	0.87	0.90
Macoma balthica	9.953	23	45	68	74	0.29	0.58	0.87	0.90
Macoma balthica	10.055	23	45	68	74	0.29	0.58	0.87	0.90
Macoma balthica	10.157	23	45	68	74	0.29	0.58	0.87	0.90
Macoma balthica	10.258	23	46	69	74	0.29	0.58	0.87	0.90
Macoma balthica	10.360	23	46	69	75	0.29	0.58	0.87	0.90
Macoma balthica	10.461	23	46	69	75	0.29	0.58	0.87	0.90
Macoma balthica	10.563	23	46	69	75	0.29	0.58	0.87	0.90
Macoma balthica	10.664	23	46	69	75	0.29	0.58	0.87	0.90
Macoma balthica	10.766	23	46	69	75	0.29	0.59	0.88	0.91
Macoma balthica	10.868	23	46	69	75	0.29	0.59	0.88	0.91
Macoma balthica	10.969	23	47	70	75	0.29	0.59	0.88	0.91
Macoma balthica	11.071	23	47	70	75	0.29	0.59	0.88	0.91
Macoma balthica	11.172	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.274	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.375	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.477	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.579	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.680	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.782	23	47	70	76	0.29	0.59	0.88	0.91
Macoma balthica	11.883	24	47	71	76	0.30	0.59	0.89	0.91
Macoma balthica	11.985	24	47	71	76	0.30	0.59	0.89	0.91
Macoma balthica	12.086	24	47	71	77	0.29	0.59	0.88	0.91
Macoma balthica	12.188	24	47	71	77	0.30	0.59	0.89	0.91
Macoma balthica	12.290	24	47	71	77	0.30	0.59	0.89	0.91
Macoma balthica	12.391	24	47	71	77	0.30	0.59	0.89	0.91
Macoma balthica	12.493	24	48	72	77	0.30	0.59	0.89	0.91
Macoma balthica	12.594	24	48	72	77	0.30	0.59	0.89	0.92
Macoma balthica	12.696	24	48	72	77	0.30	0.59	0.89	0.92
Macoma balthica	12.797	24	48	72	77	0.30	0.59	0.89	0.92
Macoma balthica	12.899	24	48	72	77	0.30	0.59	0.89	0.92
Macoma balthica	13.000	24	48	72	78	0.30	0.59	0.89	0.92
Macoma balthica	13.102	24	48	72	78	0.30	0.59	0.89	0.92
Macoma balthica	13.204	24	48	72	78	0.30	0.59	0.89	0.92
Macoma balthica	13.305	24	49	73	78	0.30	0.59	0.89	0.92
Macoma balthica	13.407	24	48	72	78	0.30	0.59	0.89	0.92
Macoma balthica	13.508	24	49	73	78	0.30	0.60	0.90	0.92
Macoma balthica	13.610	24	49	73	78	0.30	0.59	0.89	0.92
Macoma balthica	13.711	24	49	73	78	0.30	0.60	0.90	0.92
Macoma balthica	13.813	24	49	73	78	0.30	0.60	0.90	0.92
Macoma balthica	13.915	24	49	73	78	0.30	0.60	0.90	0.92
Macoma balthica	14.016	24	49	73	78	0.30	0.60	0.90	0.92
Macoma balthica	14.118	24	49	73	79	0.30	0.60	0.90	0.92
Macoma balthica	14.219	25	49	74	79	0.30	0.60	0.90	0.92
Macoma balthica	14.321	24	49	73	79	0.30	0.60	0.90	0.92
Macoma balthica	14.422	25	49	74	79	0.30	0.60	0.90	0.93
Macoma balthica	14.524	25	49	74	79	0.30	0.60	0.90	0.92
Macoma balthica	14.626	24	49	73	79	0.30	0.60	0.90	0.92
Macoma balthica	14.727	25	49	74	79	0.30	0.60	0.90	0.93
Macoma balthica	14.829	25	49	74	79	0.30	0.60	0.90	0.93
Macoma balthica	14.930	25	49	74	79	0.30	0.60	0.90	0.93
Macoma balthica	15.032	25	49	74	79	0.30	0.60	0.90	0.93
Macoma balthica	15.133	25	50	75	79	0.30	0.60	0.90	0.93
Macoma balthica	15.235	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	15.336	25	50	75	80	0.30	0.60	0.90	0.93
Macoma balthica	15.438	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	15.540	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	15.641	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	15.743	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	15.844	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	15.946	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	16.047	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	16.149	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	16.251	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	16.352	25	50	75	80	0.30	0.61	0.91	0.93
Macoma balthica	16.454	25	51	76	80	0.30	0.61	0.91	0.93
Macoma balthica	16.555	25	50	75	81	0.30	0.61	0.91	0.93
Macoma balthica	16.657	25	51	76	81	0.30	0.61	0.91	0.93
Macoma balthica	16.758	25	51	76	81	0.30	0.61	0.91	0.93

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Nephtys cirrosa	0.105	1	2	3	7	0.03	0.06	0.09	0.21
Nephtys cirrosa	0.210	2	4	6	13	0.06	0.13	0.19	0.33
Nephtys cirrosa	0.314	3	6	9	17	0.09	0.17	0.26	0.40
Nephtys cirrosa	0.419	4	8	12	21	0.10	0.21	0.31	0.46
Nephtys cirrosa	0.524	5	10	15	25	0.12	0.25	0.37	0.51
Nephtys cirrosa	0.629	6	12	18	28	0.14	0.27	0.41	0.55
Nephtys cirrosa	0.733	7	13	20	30	0.15	0.29	0.44	0.57
Nephtys cirrosa	0.838	8	15	23	33	0.16	0.32	0.48	0.60
Nephtys cirrosa	0.943	8	17	25	35	0.17	0.34	0.51	0.62
Nephtys cirrosa	1.048	9	18	27	37	0.18	0.35	0.53	0.64
Nephtys cirrosa	1.153	10	19	29	38	0.19	0.37	0.56	0.65
Nephtys cirrosa	1.257	10	21	31	40	0.19	0.38	0.57	0.67
Nephtys cirrosa	1.362	11	21	32	41	0.20	0.39	0.59	0.68
Nephtys cirrosa	1.467	11	23	34	42	0.20	0.41	0.61	0.69
Nephtys cirrosa	1.572	11	23	34	44	0.20	0.41	0.61	0.70
Nephtys cirrosa	1.676	12	24	36	45	0.21	0.42	0.63	0.71
Nephtys cirrosa	1.781	12	25	37	46	0.21	0.43	0.64	0.72
Nephtys cirrosa	1.886	13	25	38	47	0.22	0.43	0.65	0.73
Nephtys cirrosa	1.991	13	27	40	48	0.22	0.44	0.66	0.74

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Nephtys cirrosa	2.096	13	27	40	49	0.22	0.45	0.67	0.74
Nephtys cirrosa	2.200	14	27	41	50	0.23	0.45	0.68	0.75
Nephtys cirrosa	2.305	14	28	42	51	0.23	0.46	0.69	0.75
Nephtys cirrosa	2.410	14	29	43	52	0.23	0.46	0.69	0.76
Nephtys cirrosa	2.515	15	29	44	53	0.23	0.47	0.70	0.77
Nephtys cirrosa	2.619	15	30	45	53	0.24	0.47	0.71	0.77
Nephtys cirrosa	2.724	15	30	45	54	0.24	0.47	0.71	0.77
Nephtys cirrosa	2.829	15	31	46	55	0.24	0.48	0.72	0.78
Nephtys cirrosa	2.934	16	31	47	55	0.24	0.49	0.73	0.78
Nephtys cirrosa	3.039	16	31	47	56	0.24	0.49	0.73	0.79
Nephtys cirrosa	3.143	16	32	48	56	0.24	0.49	0.73	0.79
Nephtys cirrosa	3.248	16	33	49	57	0.25	0.49	0.74	0.80
Nephtys cirrosa	3.353	16	33	49	57	0.25	0.49	0.74	0.80
Nephtys cirrosa	3.458	16	33	49	58	0.25	0.50	0.75	0.80
Nephtys cirrosa	3.562	17	33	50	58	0.25	0.50	0.75	0.81
Nephtys cirrosa	3.667	17	34	51	59	0.25	0.50	0.75	0.81
Nephtys cirrosa	3.772	17	34	51	59	0.25	0.51	0.76	0.81
Nephtys cirrosa	3.877	17	35	52	60	0.25	0.51	0.76	0.81
Nephtys cirrosa	3.982	18	35	53	60	0.26	0.51	0.77	0.82
Nephtys cirrosa	4.086	18	35	53	61	0.26	0.51	0.77	0.82
Nephtys cirrosa	4.191	18	35	53	61	0.26	0.51	0.77	0.82
Nephtys cirrosa	4.296	18	36	54	61	0.26	0.52	0.78	0.83
Nephtys cirrosa	4.401	18	36	54	62	0.26	0.52	0.78	0.83
Nephtys cirrosa	4.505	18	36	54	63	0.26	0.52	0.78	0.83
Nephtys cirrosa	4.610	18	37	55	63	0.26	0.52	0.78	0.83
Nephtys cirrosa	4.715	19	37	56	63	0.26	0.53	0.79	0.83
Nephtys cirrosa	4.820	19	37	56	64	0.26	0.53	0.79	0.84
Nephtys cirrosa	4.925	19	37	56	64	0.27	0.53	0.80	0.84
Nephtys cirrosa	5.029	19	37	56	64	0.27	0.53	0.80	0.84
Nephtys cirrosa	5.134	19	38	57	65	0.27	0.53	0.80	0.84
Nephtys cirrosa	5.239	19	38	57	65	0.27	0.53	0.80	0.85
Nephtys cirrosa	5.344	19	39	58	65	0.27	0.53	0.80	0.85
Nephtys cirrosa	5.448	19	39	58	65	0.27	0.54	0.81	0.85
Nephtys cirrosa	5.553	19	39	58	66	0.27	0.54	0.81	0.85
Nephtys cirrosa	5.658	20	39	59	66	0.27	0.54	0.81	0.85
Nephtys cirrosa	5.763	20	39	59	67	0.27	0.54	0.81	0.85
Nephtys cirrosa	5.868	20	39	59	67	0.27	0.54	0.81	0.86
Nephtys cirrosa	5.972	20	40	60	67	0.27	0.55	0.82	0.86
Nephtys cirrosa	6.077	20	40	60	67	0.27	0.55	0.82	0.86
Nephtys cirrosa	6.182	20	40	60	68	0.27	0.55	0.82	0.86
Nephtys cirrosa	6.287	20	41	61	68	0.27	0.55	0.82	0.86
Nephtys cirrosa	6.391	20	41	61	68	0.27	0.55	0.82	0.86
Nephtys cirrosa	6.496	20	41	61	69	0.27	0.55	0.82	0.87
Nephtys cirrosa	6.601	20	41	61	69	0.28	0.55	0.83	0.87
Nephtys cirrosa	6.706	20	41	61	69	0.28	0.55	0.83	0.87
Nephtys cirrosa	6.811	21	41	62	69	0.28	0.55	0.83	0.87
Nephtys cirrosa	6.915	21	41	62	69	0.28	0.55	0.83	0.87
Nephtys cirrosa	7.020	21	41	62	70	0.28	0.55	0.83	0.87
Nephtys cirrosa	7.125	21	41	62	70	0.28	0.55	0.83	0.87
Nephtys cirrosa	7.230	21	42	63	70	0.28	0.56	0.84	0.87
Nephtys cirrosa	7.334	21	42	63	70	0.28	0.56	0.84	0.87
Nephtys cirrosa	7.439	21	42	63	71	0.28	0.56	0.84	0.88
Nephtys cirrosa	7.544	21	43	64	71	0.28	0.56	0.84	0.88
Nephtys cirrosa	7.649	21	43	64	71	0.28	0.56	0.84	0.88
Nephtys cirrosa	7.754	21	43	64	71	0.28	0.56	0.84	0.88
Nephtys cirrosa	7.858	21	43	64	71	0.28	0.56	0.84	0.88
Nephtys cirrosa	7.963	21	43	64	72	0.28	0.57	0.85	0.88
Nephtys cirrosa	8.068	22	43	65	72	0.28	0.57	0.85	0.88
Nephtys cirrosa	8.173	22	43	65	72	0.28	0.57	0.85	0.88
Nephtys cirrosa	8.277	22	43	65	72	0.28	0.57	0.85	0.88
Nephtys cirrosa	8.382	22	43	65	72	0.28	0.57	0.85	0.89
Nephtys cirrosa	8.487	22	44	66	73	0.28	0.57	0.85	0.89
Nephtys cirrosa	8.592	22	44	66	73	0.28	0.57	0.85	0.89
Nephtys cirrosa	8.697	22	44	66	73	0.28	0.57	0.85	0.89
Nephtys cirrosa	8.801	22	44	66	73	0.28	0.57	0.85	0.89
Nephtys cirrosa	8.906	22	44	66	73	0.29	0.57	0.86	0.89
Nephtys cirrosa	9.011	22	45	67	74	0.29	0.57	0.86	0.89
Nephtys cirrosa	9.116	22	45	67	74	0.29	0.57	0.86	0.89
Nephtys cirrosa	9.220	22	45	67	74	0.29	0.57	0.86	0.89
Nephtys cirrosa	9.325	22	45	67	74	0.29	0.57	0.86	0.89
Nephtys cirrosa	9.430	22	45	67	74	0.29	0.57	0.86	0.90
Nephtys cirrosa	9.535	22	45	67	74	0.29	0.57	0.86	0.89
Nephtys cirrosa	9.640	23	45	68	74	0.29	0.57	0.86	0.90
Nephtys cirrosa	9.744	23	45	68	75	0.29	0.58	0.87	0.90
Nephtys cirrosa	9.849	23	45	68	75	0.29	0.57	0.86	0.90
Nephtys cirrosa	9.954	23	45	68	75	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.059	23	45	68	75	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.163	23	45	68	75	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.268	23	46	69	75	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.373	23	46	69	76	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.478	23	46	69	76	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.583	23	46	69	76	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.687	23	46	69	76	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.792	23	46	69	76	0.29	0.58	0.87	0.90
Nephtys cirrosa	10.897	23	47	70	76	0.29	0.58	0.87	0.90

		NUMBER OF SPECIES				SIMILARITY			
Habitat	sampling surface	POOR	MOD	GOOD	HIGH	Poor	Mod	GOOD	HIGH
Nephtys cirrosa	11.002	23	47	70	76	0.29	0.58	0.87	0.90
Nephtys cirrosa	11.106	23	47	70	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.211	23	47	70	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.316	23	47	70	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.421	23	47	70	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.526	23	47	70	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.630	24	47	71	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.735	24	47	71	77	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.840	24	47	71	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	11.945	24	47	71	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	12.049	24	47	71	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	12.154	24	47	71	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	12.259	24	48	72	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	12.364	24	48	72	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	12.469	24	48	72	78	0.29	0.59	0.88	0.91
Nephtys cirrosa	12.573	24	48	72	78	0.30	0.59	0.89	0.91
Nephtys cirrosa	12.678	24	48	72	78	0.30	0.59	0.89	0.91
Nephtys cirrosa	12.783	24	48	72	78	0.30	0.59	0.89	0.91
Nephtys cirrosa	12.888	24	48	72	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	12.992	24	48	72	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.097	24	48	72	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.202	24	49	73	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.307	24	49	73	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.412	24	49	73	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.516	24	49	73	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.621	24	49	73	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.726	24	49	73	79	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.831	25	49	74	80	0.30	0.59	0.89	0.92
Nephtys cirrosa	13.935	24	49	73	80	0.30	0.59	0.89	0.92
Nephtys cirrosa	14.040	24	49	73	80	0.30	0.59	0.89	0.92
Nephtys cirrosa	14.145	24	49	73	80	0.30	0.59	0.89	0.92
Nephtys cirrosa	14.250	24	49	73	80	0.30	0.59	0.89	0.92
Nephtys cirrosa	14.355	25	49	74	80	0.30	0.60	0.90	0.92
Nephtys cirrosa	14.459	25	49	74	80	0.30	0.60	0.90	0.92
Nephtys cirrosa	14.564	25	49	74	80	0.30	0.60	0.90	0.92
Nephtys cirrosa	14.669	25	49	74	80	0.30	0.60	0.90	0.92
Nephtys cirrosa	14.774	25	49	74	80	0.30	0.60	0.90	0.92
Nephtys cirrosa	14.878	25	49	74	80	0.30	0.60	0.90	0.92
Nephtys cirrosa	14.983	25	49	74	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.088	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.193	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.298	25	49	74	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.402	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.507	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.612	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.717	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.821	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	15.926	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	16.031	25	51	76	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	16.136	25	50	75	81	0.30	0.60	0.90	0.93
Nephtys cirrosa	16.241	25	51	76	82	0.30	0.60	0.90	0.93
Nephtys cirrosa	16.345	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	16.450	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	16.555	25	50	75	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	16.660	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	16.764	25	51	76	82	0.30	0.60	0.90	0.93
Nephtys cirrosa	16.869	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	16.974	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.079	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.184	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.288	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.393	25	51	76	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.498	26	51	77	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.603	26	51	77	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.707	26	51	77	82	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.812	26	51	77	83	0.30	0.61	0.91	0.93
Nephtys cirrosa	17.917	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.022	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.127	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.231	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.336	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.441	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.546	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.650	26	52	78	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.755	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.860	26	51	77	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	18.965	26	52	78	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	19.070	26	52	78	83	0.31	0.61	0.92	0.94
Nephtys cirrosa	19.174	26	52	78	83	0.30	0.61	0.91	0.94
Nephtys cirrosa	19.279	26	52	78	83	0.31	0.61	0.92	0.94
Nephtys cirrosa	19.384	26	52	78	83	0.31	0.61	0.92	0.94
Nephtys cirrosa	19.489	26	52	78	84	0.31	0.61	0.92	0.94

6.4 Assessment precision

density											
slope values		> +1		< +0.6 and > +0.2		max +0.2		max +0.1			
habitat		surface	Good min	surface	Good min	surface	Good min	surface	Good min	Good end	tot surface
Abra alba habitat	2	0.6	6.57	1.03	7.14	2.26	7.71	3.9	7.97	8.54	28.5
Macoma balthica habitat	3	0.4	3.34	0.6	3.57	1.62	4.01	3.45	4.34	4.86	16.7
Nephtys cirrosa habitat	4	0.4	3.31	0.63	3.47	0.94	3.59	1.68	3.75	4.12	19.5
		minimal		OK		optimal		maximal			

number of species											
slope values		> +10		< +6 and > +2		max +2		max +1			
habitat		surface	Good	surface	Good	surface	Good	surface	Good	Good end	tot surface
Abra alba habitat	2	1.44	68	2.05	76	5.95	99	12.43	114	130	28.5
Macoma balthica habitat	3	1.21	29	1.83	38	5.07	57	9.54	67	76	16.7
Nephtys cirrosa habitat	4	1.15	29	1.78	37	4.92	56	8.38	65	78	19.5
		minimal		OK		optimal		maximal			

similarity											
slope values		> +0.1		< +0.06 and > +0.02		max +0.02		max +0.01			
habitat		surface	Good	surface	Good	surface	Good	surface	Good	Good end	tot surface
Abra alba habitat	2	1.02	0.69	1.44	0.74	2.77	0.81	4.01	0.84	0.95	28.5
Macoma balthica habitat	3	1.21	0.55	1.73	0.62	3.86	0.76	5.38	0.8	0.91	16.7
Nephtys cirrosa habitat	4	1.15	0.56	1.78	0.64	3.98	0.77	5.24	0.8	0.92	19.5
		minimal		OK		optimal		maximal			

For each sampling surface of the reference value distributions, the changes in the 'good/moderate' boundary value with sampling surface was evaluated with a local regression encompassing 6 neighbouring sample surfaces, which gives the slope of these regression. For each parameter, boundaries for the assessment precision classes (minimal, OK, optimal, maximal) are determined based on these slope values. For each assessment class and parameter the sampling surface and good boundary value corresponding with the boundary values are listed in the table.

6.5 Protocols

Biomass determination

De biomassa werd bepaald volgens de gestandaardiseerde methodes gehanteerd voor het macrobenthos van het Belgisch Continentaal Plat: het gewichtsverlies door verassing. Alle organismen werden, per staal en per soort, in een vooraf gewogen aluminium schuitje (kleinere organismen) of porseleinen kroesje (grotere organismen) gebracht waarna ze een eerste maal gewogen werden (natgewicht). Vervolgens werden ze 24 uur lang gedroogd bij 110°C. Na afkoeling in een exsicator werden de schuitjes en kroezen een tweede keer gewogen (drooggewicht). Daarna werd de fauna verast in de moffeloven (2 uur bij 480°C) en na afkoeling in een exsicator opnieuw gewogen (asgewicht). Het asvrij drooggewicht (AFDW) is dan gelijk aan het verschil tussen het drooggewicht (DW) en het asgewicht (AW).

DAG 1

1 Alu schuitjes/kroesjes en porselein 2 uur in moffeloven (550°C) om te steriliseren

2 Administratie voorbereiden

3 2 uur in exsiccator (enkel die met speciale luchtdop!) om af te koelen

4 Schuitjes/kroezen wegen + vervolgens wetweight bepalen van de fauna

6 **24 uur in droogoven (110°C)**

DAG 2

7 na droogoven 2 uur in exsiccator om af te koelen; ondertussen nieuwe laten drogen

8 Wegen (drooggewicht)

9 **2 uur in moffeloven (480°C)**

10 2 uur in exsiccator om af te koelen

11 Wegen (asgewicht)

12 Aluminium kroesjes mogen weg, porseleinen kroesjes uitkuisen

13 droogewicht – asgewicht = asvrij drooggewicht

Protocol korrelgrootteanalyse met Mastersizer

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Voorbereiding van de stalen

Van ruwe stalen (in de blauwe urinepotjes) wordt eerst 30g afgewogen. Deze 30g gaat over de zeeftoren met een geijkte zeef van 1,600mm gedurende 2 minuten op 80% sterkte.
De afgezeefde fractie wordt dan gewogen en apart in de databank ingevoerd.
Indien de stalen veel aaneengeklit slib bevatten worden deze door middel van een stamper en mortier tot poeder vermalen.

Analyse

Voorbereiding op 1Ste analyse van de dag

Men opent het mastersizerprogramma door op het icoon op de desktop te klikken. Ga via Measure naar Manual. Klik op Accessory, geef 3 in bij "number of cycles" en klik op Clean.
De mastersizer zal een autoclear lopen.
Als de autoclean is afgelopen mag het Mesurement display gesloten worden.

Analyse

Open via Measure en Start SOP de SOP genaamd Marbiol.
Geef de naam van het staal in onder de vorm "name dd/mm/jj" en klik op start
Wanneer het programma vraagt om staal toe te voegen, voeg je een beetje staal toe aan het water. Blijf staal toevoegen tot de obscuratie ongeveer 10% bereikt.
Let wel: de obscuratie moet na ultrasonificatie tussen 10 en 20% liggen. Dit wil zeggen dat men bij slibrijke stalen rekening moet houden dat deze nog scherp kan stijgen.
Na de analyse wordt de data automatisch opgeslagen in een mea.-bestand

Export van de data

Omdat de Mea-bestanden voor ons niet handig zijn exporteren we de data naar een exelbestand. Dit gebeurt de de gewenste resultaten te selecteren, te kopieren en te plakken in de exelformat "format voor resultaten" die je terugvindt op de desktop.

Instellingen van de SOP Marbiol

Sampler settings

pump speed: 2500rpm
Stirrer speed: 1000rpm
Pre-measurement ultrasonics: 60sec 50%
Automatic tank fill

Measurement cycles

1 aliquot per SOP
1 measurement per aliquot
1 flush before the aliquot, 2 fluches after
Cleaning mode: automatic and Single Rinse

Material
Material: Schelpzand RI:1.55
Dispersant: Water RI:1.33
Measurement
Measurement time: 15sec
Measurement snaps: 15000
Background time: 15sec
Background snaps: 15000

Veel voorkomende problemen

De mastersizer keurt het alignment af.
=> Analyse afbreken, cassette uithalen en vensters schoonmaken met lens tissues
De hydro-unit vult zichzelf niet meer met water
=> Het witte staafje naast de mixer is vervuild, gewoon grondig afvegen met een doekje
De achtergrond ligt te hoog
=> Waarschijnlijk zit er een schelpstukje vast voor de vensters. Cassette uithalen, glaasjes uitdraaien en schoonmaken