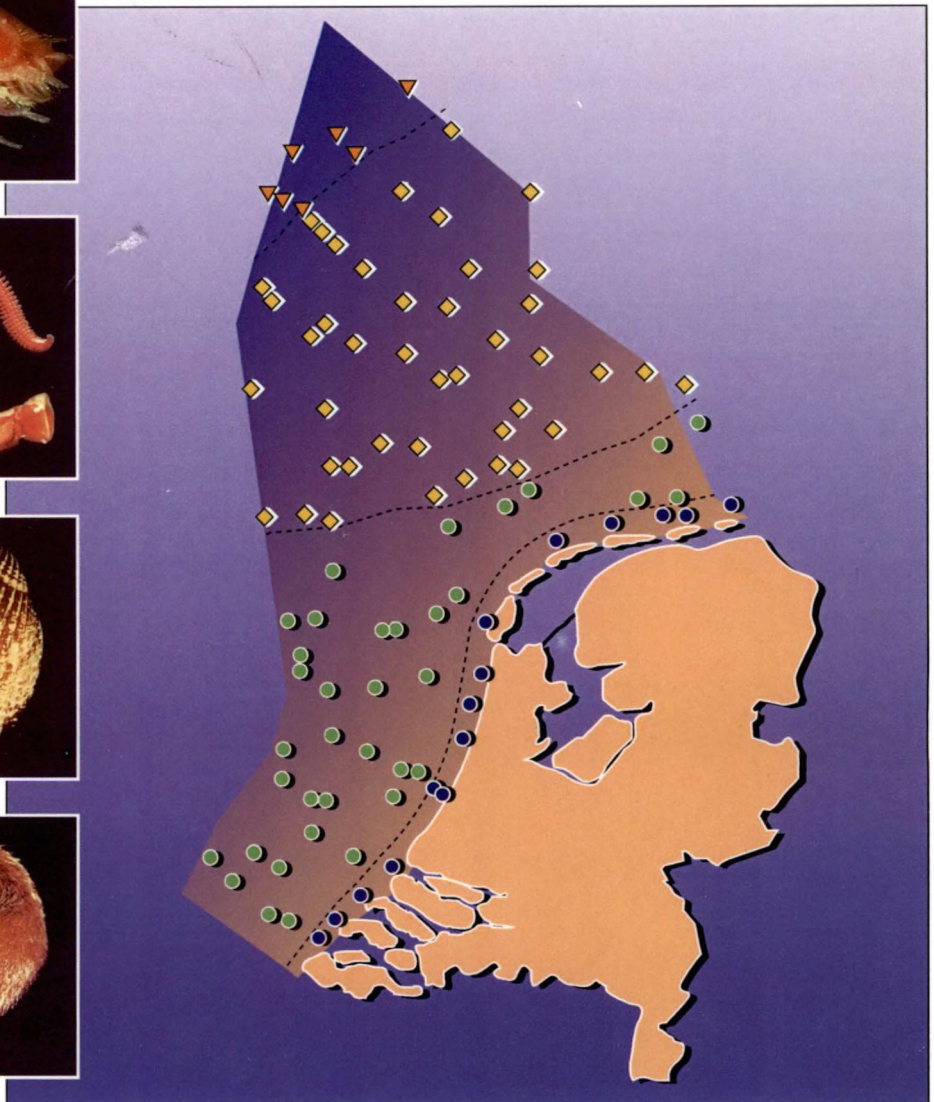
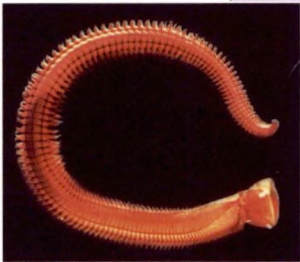


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THE MACROBENTHIC FAUNA IN THE DUTCH SECTOR OF THE NORTH SEA IN 2003 AND A COMPARISON WITH PREVIOUS DATA

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Koninklijk Nederlands Instituut voor Onderzoek der Zee

Monitoring Macrozoobenthos of the North Sea

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THE MACROBENTHIC FAUNA IN THE DUTCH SECTOR OF THE NORTH SEA IN 2003 AND A COMPARISON WITH PREVIOUS DATA

R. DAAN AND M. MULDER

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This report presents data of the monitoring program of macrozoobenthos in the Dutch Continental Shelf (DCS) of the North Sea, a cooperation between the National Institute for Coastal and Marine Management/RIKZ (Rijkswaterstaat), the North Sea Directorate (Rijkswaterstaat) and the Department of Marine Ecology (NIOZ)

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1. SUMMARY

In this report the results are presented of a macrobenthos survey on the Dutch Continental Shelf (DCS), carried out in 2003. The survey forms part of the 'Biological monitoring program of marine waters' (MON*BIOLOGIE, generally referred to as 'BIOMON') which was initiated by the National Institute for Coastal and Marine Management (RIKZ). The purpose of the program is to obtain insight into the year-to-year variations of the macrobenthic assemblages and to detect trend-like changes, that possibly indicate anthropogenic influences on the marine environment (*e.g.* eutrophication, pollution, beam-trawl fishery).

Within the framework of this project fieldwork is carried out every year in spring. In 2003 the 100 BIOMON stations were sampled in the period between March 24 and April 23. On the basis of the results collected in 2003 and previous years an analysis is made of the trends and fluctuations of some selected species and of basic community attributes over the period 1986-2003. The community attributes studied were the diversity, abundance and biomass of the total macrofauna. Temporal variation or trends were investigated separately for each of the four subareas in the DCS *i.e.* the Coastal, Offshore areas, Dogger Bank and Oyster Ground. The conclusions of this study can be summarized as follows:

1. At the Dogger Bank the sand star *Acrocnida brachiata* and the bivalve *Mysella bidentata* have shown decreasing abundance since 1999. Densities were still low in 2003. The amphipod *Bathyporeia elegans* has, after peak abundance in 2000, continuously decreased. Further, the polychaete *Aricidea minuta*, which gradually disappeared by the end of the nineties, was still absent in 2003. New to the Dogger Bank is the occurrence of the bivalve *Tridonta montagui*, the polychaete *Rhodine loveni* and the sand worm *Echiurus echiurus*.
2. In the Oyster Ground a substantial (and statistically significant) decrease was observed in the silt content of the upper 10 cm of the sediment. In 1999 there were 12 stations where the silt contents were more than 20%, but in 2002 and 2003 such high concentrations were no longer observed. In the other subareas silt contents did not change and the median grain size was stable too.
3. In the Oyster Ground there is no indication that the decrease of the silt concentrations in the sediment has affected the abundance of one or more of the most common species. A number of species were found for the first time in the Oyster ground, at least within the BIOMON programme. These species were the polychaetes *Brada villosa*, *Pherusa plumosa*, *Polyphysia crassa* and *Drilonereis filum*, the crustacean

Leptognathia and the sand worm *Echiurus echiurus*. Some of these species have been found in one or a few other research projects.

4. The western part of the southern offshore area (including ten stations) appeared to be extremely poor in fauna in 2003. It was known that this area is not particularly rich, but in preceding years the mean number of species per sample was always well beyond 10. In 2003 this number was 6.8 species per sample. There is no explanation for this low value. The sea spider *Endeis spinosa* and the crustacean *Stenula rubrovittata* are (within BIOMON) species new for the offshore area. For the first species there was only one record from the Oyster Ground, for the second species one from the offshore area and one from the Dogger Bank.
5. In the offshore area a gradual decrease could be observed in Simpson's dominance between 1995 and 2003. This was explained by the fact that some polychaete species that were particularly abundant in the mid-nineties and dominated the fauna by number had decreased abundance. As a result the numbers of individuals were more evenly distributed among the different species.
6. In the coastal area the amphipod *Urothoe poseidonis*, which had shown an increase from 1998 onwards, continued this increase in 2003. A species that reached very high biomass values was the razor clam *Ensis americanus*. This species must have had a very successful spatfall in 2001, since in spring of 2002 already large numbers of juveniles were found at several stations all along the Dutch coast. These animals had grown considerably in 2003, so biomass had substantially increased. Growth rates appeared to be not the same at different stations. It is suggested that not only different feeding conditions caused the differences in growth rates, but that enhanced intraspecific competition for space and food may play an important role, particularly in dense populations. The consequence of the large numbers of *E. americanus* was that the average total biomass value (142 g AFDW per m²) was higher than ever.

2. SAMENVATTING

In dit rapport worden de resultaten gepresenteerd van een macrobenthos bemonstering die in 2003 werd uitgevoerd op het Nederlands Continentale Plat (NCP). De bemonstering vond plaats in het kader van het 'Biologische Monitoring Programma Zoute Wateren' (MON*BIOLOGIE, gewoonlijk aangeduid als 'BIOMON'), dat geïnitieerd is door het Rijksinstituut voor Kust en Zee. Met het project wordt beoogd inzicht te krijgen in de jaarlijkse fluctuaties van de macrobenthos gemeenschappen en vast te stellen of er op de langere termijn trendmatige veranderingen optreden. Dergelijke veranderingen zouden onder meer kunnen plaats vinden als gevolg van antropogene activiteiten (bijv. eutrofiëring, verontreiniging, boomkorvisserij).

In het kader van dit project wordt jaarlijks veldonderzoek uitgevoerd in het voorjaar. In 2003 zijn de 100 BIOMON stations tussen 24 maart en 23 april bemonsterd. Aan de hand van de gegevens die in 2003 en voorgaande jaren zijn verzameld is een overzicht verkregen van de trends en fluctuaties bij een aantal geselecteerde soorten en een aantal kenmerken van de benthische gemeenschap als geheel over de periode 1986 - 2003. De parameters die de bodemgemeenschap kenmerken zijn hier de diversiteit, de dichtheid en de biomassa van de totale fauna. Temporele variatie en trends zijn voor vier subgebieden van het NCP, de Kustzone, het Offshore gebied, de Doggersbank en de Oestergronden, afzonderlijk onderzocht. De conclusies van deze studie kunnen als volgt worden samengevat:

1. Op de Doggersbank vertonen de slangster *Acrocnida brachiata* en het tweetandschelpje *Mysella bidentata* sinds 1999 een afnemende trend. De dichtheden waren in 2003 nog steeds laag. De amphipode *Bathyporeia elegans* is, na piekaantallen in 2000, continu afgenomen. Verder was de polychaet *Aricidea minuta*, die aan het eind van de negentiger jaren geleidelijk is verdwenen, in 2003 nog steeds afwezig. Nieuw voor de Doggersbank is het voorkomen van de driehoekige *Astarte*, *Tridonta montagui*, de polychaet *Rhodine loveni* en de zandworm *Echiurus echiurus*.
2. In de Oestergronden werd een aanzienlijke en statistisch significante afname waargenomen in de slibgehalten van de bovenste 10 cm van het sediment. In 1999 waren er 12 stations waar het slibgehalte meer dan 20% bedroeg, maar in 2002 en 2003 werden zulke hoge concentraties niet meer gevonden. In de andere subgebieden was er geen verandering in slib en ook de mediane korrelgrootte was constant.
3. In de Oestergronden bestaat er geen aanwijzing dat de afname van slibconcentraties in het sediment gevolgen heeft gehad voor de dichtheden van een of meer van de meest algemene soorten. Er was een zestal soorten die, althans binnen het BIOMON-

programma, nog niet eerder in de Oestergronden werden aangetroffen. Het gaat hier om de polychaeten *Brada villosa*, *Pherusa plumosa*, *Polyphysia crassa* en *Drilonereis filum*, de crustacee *Leptognathia spec.* en de zandworm *Echiurus echiurus*.

4. Het westelijke deel van het zuidelijke offshoregebied (10 stations) bleek in 2003 een extreem arme fauna te herbergen. Weliswaar is in voorgaande jaren al gebleken dat dit gebied niet bepaald rijk te noemen is, het gemiddelde aantal soorten per monster bedroeg toch altijd duidelijk meer dan 10. In 2003 waren er gemiddeld maar 6.8 soorten per monster. Er is geen verklaring voor dit geringe aantal. De zeespin *Endeis spinosa* en de crustacee *Stenula rubrovittata* zijn soorten die (binnen BIOMON) nog niet eerder zijn gevonden in het offshoregebied. Van de eerste soort bestond alleen een vroegere melding uit de Oestergronden, van de tweede een uit het offshoregebied en een van de Doggersbank.
5. In het offshore-gebied werd tussen 1995 en 2003 een geleidelijke afname gevonden in dominantie op basis van de Simpson's index. De oorzaak moet worden gezocht in een geleidelijke afname van enkele polychaetensoorten die met name in het midden van de negentiger jaren zeer talrijk waren en toen qua aantal domineerden. Als gevolg hiervan waren de aantallen individuen nu meer gelijkmatig verspreid over de verschillende soorten.
6. In de kustzone nam de amphipode *Urothoe poseidonis*, die al vanaf 1998 een toename heeft laten zien, verder in aantal toe. Een soort die qua biomassa sterk was toegenomen was de Amerikaanse zwaardschede *Ensis americanus*. Deze soort moet in 2001 een zeer succesvolle broedval hebben gehad. In het voorjaar van 2002 werden namelijk al grote aantallen juvenielen gevonden op verscheidene stations langs de gehele Nederlandse kust. Deze dieren waren in 2003 flink gegroeid, waardoor de biomassa enorm is toegenomen. Groei bleek overigens op de verschillende stations niet overal even snel te gaan. Deels kunnen verschillen in voedselaanbod deze verschillen in groeisnelheid misschien verklaren, maar er zijn duidelijke aanwijzingen dat verhoogde intraspecifieke concurrentie om ruimte en voedsel in dicht opeengepakte populaties ook een belangrijke rol kan spelen. Als gevolg van de grote aantallen *E. americanus* was de gemiddelde totale biomassa (142 g AFDW per m²) hoger dan ooit.

3. INTRODUCTION

In 1989 the **BIO**logical **MON**itoring program of marine waters (project MON* BIOLOGIE) was started with the goal to study the temporal variation of the marine ecosystems on the Dutch Continental Shelf (DCS) including the Wadden Sea and the Delta area. It is an initiative of the National Institute for Coastal and Marine Management (RIKZ) of Rijkswaterstaat in association with several Dutch institutes (Yland, 1995). The biological monitoring program comprises besides the macrobenthos also plankton, fish, seagrass, hard substrate populations, seabirds and mammals.

This report presents the data collected during the macrobenthos survey carried out in spring 2003. Further the results of the 2003 survey are compared with the BIOMON data collected in previous years (1991-2003) and those obtained during the ICES North Sea Benthos Survey (ICES-NSBS, 1986) and the MILZON-BENTHOS program (1988-1993). In 1990 a pilot study of the BIOMON project was carried out at 7 locations on the DCS and the results are also included in the data base.

The aim of the BIOMON program is to obtain insight in the spatial and temporal variation in the composition of the macrobenthos and to detect possible trendlike changes on the DCS as a whole or in parts of it. During the first years (1991-1994) there were 25 stations located along 5 transects perpendicular to the Dutch coast. At these stations 5 replicate boxcore samples were collected each year. Although in this way a rather detailed picture was obtained of the fauna composition at each of these stations, it was argued that (changes in) the macrobenthos composition of the DCS as a whole could better be studied by spreading the sampling effort over a larger number of stations. Therefore, from 1995 onwards the sampling strategy changed and each year 100 stations were visited, that were selected according to a stratified random sampling design in each of the 4 subareas of the DCS, i.e. Dogger Bank, Oyster Ground, Offshore area and Coastal area (Fig. 1). The number of stations within each subarea was proportional to its surface area. At each station only one sample was taken. The 100 stations that were selected include the 25 original BIOMON stations. The selection procedure is described in more detail by Essink (1995) and Holtmann *et al.* (1996).

The analysis of the results obtained in previous years (Daan & Mulder, 2003) has shown that there were generally no clear trends at the community level (faunal density, biomass, biodiversity parameters) in the 4 subareas. However, in most subareas there seemed to be a slight decrease in the contribution of molluscs to the total benthic biomass. At the species level there was a clear downward trend in the abundance of the brittle star *Amphiura filiformis* in the Oyster Ground from 1993 onwards. Particularly at

the Frisian Front a dramatic decrease was observed in the abundance of this species. Further there was a decrease in the abundance of the polychaete *Nephtys cirrosa* and the gastropod *Euspira nitida* in the Offshore area and the Coastal area. The latter species also decreased at the Dogger Bank. The new data will show to what extent the apparent trends observed in previous years continued in 2003.

4. MATERIAL AND METHODS

To ensure that any changes that are observed are not due to methodological differences, the procedures for sampling and processing the fauna samples are standardized (Essink, 1991) and have remained unaltered since the beginning of the monitoring project in 1991.

4.1. SAMPLING

In 2003 the BIOMON stations were sampled in the period March 24 to April 23. Most stations have a water depth >5 m and were visited with the RV Arca or the RV Rotterdam (North Sea Directorate, RWS). However, two stations in the Coastal subarea with a water depth less than 10 m, viz. COA 13 & 14 were sampled with the RV. Delta.

Fig. 1 shows the positions of the stations. The exact geographical positions of the 100 stations, together with the DONAR codes and selected abiotic characteristics (depth/sediment) of the stations are summarized in Table 1a/b. More general information about the cruise carried out with the vessels and the weather conditions during this part of the survey in 2003 can be found in the cruise report of Rijkswaterstaat (Anonymous, 2003).

4.2. SAMPLE TREATMENTS

At each station two boxcore samples (0.078 m², minimal depth 15 cm) were taken. One of the samples was used for sediment analysis and the other sample was washed through a sieve with round holes (1 mm) to collect the macrobenthic fauna. For sediment analysis 2 subsamples (3.4 cm Ø, depth 10 cm) were pooled and immediately stored at -20°C. The residue of the macrobenthos samples was preserved in a borax-buffered solution of 4-6 % formaldehyde in seawater and stored at room temperature.

In the laboratory the macrobenthos samples were stained with rose-bengal and washed over a set of nested sieves with 0.7 mm as the smallest mesh size to facilitate

sorting. The macrofauna was identified to species level, except for some notoriously difficult taxa such as anthozoans, phoronids, priapulids and nemerteans, and subsequently counted. Juvenile macrobenthic animals which because of their size could not be identified to species level were recorded on higher taxonomic levels, usually the genus level. Sizes (to nearest 0.5 mm) were recorded for most molluscs and echinoderms.

4.3. ASHFREE DRY WEIGHT

The ash-free dry weight (AFDW) of the different taxa was determined in one of the following ways:

- Molluscs and echinoids:

By means of length-AFDW relationships of the form $W=a*L^b$ (W =AFDW in g and L =length in mm).

- Polychaetes, larger crustaceans, ophiuroids and remaining taxa:

Indirectly, by converting the (blotted) wet weight into AFDW by means of conversion factors provided by Rumohr *et al.* (1987) and Ricciardi & Bourget (1998). Wet weights were measured with a Mettler PJ300 balance to the nearest mg.

Small amphipods and cumaceans were assigned an average individual AFDW of 0.2-0.5 mg. The same value is used by Holtmann & Groenewold (1992; 1994) in their analysis of macrobenthos from the MILZON-BENTHOS project in the southern North Sea between 1991 and 1993. This estimated individual weight is based on previous determinations of the AFDW of the taxa in question (Duineveld; Holtmann, unpubl.).

4.4. STATISTICS

In addition to the density (ind./m²) and biomass (g AFDW/m²), the diversity of each macrobenthos sample was calculated. In the literature a suit of biodiversity indices have been used to identify possible changes of the benthic fauna (Hill, 1973; Peterson, 1977; Pearson & Rosenberg, 1978; Harper & Hawksworth, 1994). In this report, we used three indices each representing a different aspect of the faunal diversity. The species richness (H_0) stands for the number of species per boxcore sample and is the simplest index. The other two indices, the Shannon-Wiener index (H') (Shannon & Weaver, 1949) and the Simpson index (D) for dominance (Simpson, 1949), are based on the proportional

abundances of the individual species in the samples. The Simpson index is sensitive to the abundance only of the more plentiful species and can therefore be regarded as a measure of dominance (Hill, 1973). A high value for Simpson's index means low diversity, whereas a high value for the Hill₀ or Shannon-Wiener index indicates high diversity.

4.5. SEDIMENT ANALYSIS

At each station shown in Fig. 1, two subsamples were taken from an intact boxcore sample and subsequently pooled for laboratory analysis of the sediment composition (*e.g.* grain size, content of calcium carbonate). The grain size was analyzed with a Malvern Particle Sizer by the laboratory of the National Institute for Coastal and Marine Management (RIKZ, Middelburg). Two parameters were derived from the grain size data: the median grain size (μm) and the percentage (by weight) of mud. We here define mud as the total fraction mineral particles $< 63 \mu\text{m}$. However, for comparison with previous years we also calculated the fraction 16-63 μm .

Sediment types were classified on the basis of the median grain size as follows:

Characterization of the sediment type according to the median grain size (after Gullentops *et al.*, 1977).

$< 175 \mu\text{m}$	Very fine sand
175 - 250 μm	Fine sand
250 - 300 μm	Medium-fine sand
300 - 350 μm	Medium-coarse sand
$> 350 \mu\text{m}$	Coarse sand

5. RESULTS AND DISCUSSION

5.1 SEDIMENT COMPOSITION

The median grain size and silt content of the sediment at the stations sampled are listed in Table 1. Spatial and temporal patterns are illustrated in Fig. 2, 3 and 4.

The spatial pattern in the sediment composition in 2003 was quite similar to that in the preceding years. A look at the mean median grain size in the 4 subareas between 1995 and 2003 (Fig. 4) shows that the grain size is not only very stable, but that the variation around the mean is extremely small. Also at most of the individual stations the median grain size did not substantially change compared to preceding years. A comparison between the values measured in 2003 (Fig. 2) and those found in previous years shows that in more than 80% the size class did not change and that in most of the other cases the difference was not more than 1 size class. At most stations the difference between the highest and lowest value observed between 1996 and 2003 did not exceed 100 μm .

At some stations in the offshore area, however, the difference between the highest and lowest value between 1996 and 2003 appeared to be more than 100 μm . For three of these stations the large difference was caused by an aberrant value in one or two years. At OFF 2 (near Schiermonnikoog) unusual high median grain size values of about 340 μm were found in 1997 and 1999, whereas the values were in a narrow range of 200 – 220 μm in all other years. At OFF 6 (west of Texel) a value of 200 μm was found in 2001, which was substantially lower than the range of values of 280 – 370 μm observed in the other years. At OFF 8 (also west of Texel) the value of 140 μm found in 2001 was also clearly different from the usual range of values of 230 – 250 μm . In our previous report (Daan & Mulder, 2003) we suggested that such strongly deviating values can be found either when the station is situated along a sharp local gradient or when there has been a local and temporal disturbance of the sediment.

There was in the offshore area also a number of stations where the difference between highest and lowest median grain size was large, not because of an aberrant value in one or two years, but simply because the variation in median grain size was very high. One of these stations was OFF 29, north of Rottum and just outside the Dutch sector. The other ones, OFF 21, 24, 26, 27, 28 and 36 are situated west of Zeeland. At all these stations the sediment consists of coarse to very coarse sand, i.e. the median grain size is well beyond 350 μm . This means that, although in an absolute sense the variability in median grain size may be high, in a relative sense the variability is not higher than in fine sand.

The distribution of silt in the sediment roughly showed the same spatial pattern as in the preceding years, *i.e.* high silt concentrations in the Oyster Ground and low concentrations in the other subareas (Fig. 3). However the overall mean silt concentration appeared to have decreased almost continuously from 6.1 % in 1999 to 3.9 % in 2003. An inspection of the data showed that this decrease was caused completely by a decline of silt concentrations in the Oyster Ground. In the other subareas silt contents did not change. The decrease in the Oyster Ground was highly significant (two-way ANOVA mixed model after arctangent transformation of the data, $F = 3.543$, $p = 0.008$). In 1999 there were 12 stations where the silt contents were more than 20%, but in 2002 and 2003 such high concentrations were no longer observed.

5.2. DISTRIBUTION OF THE MACROBENTHIC FAUNA IN 2003

5.2.1 Diversity, density and biomass

A total number of 202 species/taxa were identified in the 100 boxcore samples in 2003, including 1 that was identified to genus level only and 10 that were identified to higher taxa (family level or higher). The total number of taxa is within the range of previous years (181 – 231). The distribution of the species over the stations (presence/absence) and the scientific names are given in Appendix-1. The basic data on macrobenthic abundance, biomass and diversity are listed in Appendix-2.

The mean number of species per sample (Hill 0) was, like in previous years the highest on the Dogger Bank and in the Oyster Ground and the lowest in the coastal and offshore area (Table 2, Fig. 5,8). There is an overall pattern of high species richness in the North and low species richness in the south. In the Oyster Ground a tendency for a slight increase in species richness has been observed between 1996 and 2002. This tendency did not continue in 2003. In the other subareas no clear long term trend could be observed in species richness.

As usual, the Shannon Wiener diversity was the highest at the Dogger Bank (Fig. 9). Numbers of individuals were more or less equally distributed among the species found, so Simpson's dominance was low here (Fig.10). Lower Shannon-Wiener diversity was found in the Oyster Ground and the offshore area respectively. Here the values were comparable to those found in previous years. In the offshore area, however, Simpson' dominance seems to have gradually decreased from about 0.22 in the mid-nineties to 0.14 in 2003. This should be explained by the fact that some polychaete species *like Lanice conchilega*, *Chaetozone setosa* and *Spiophanes bombyx*, which were particularly abundant in the mid-nineties and dominated the fauna by number, have gradually

decreased abundance. As a result the numbers of individuals became more evenly distributed among the different species.

The lowest Shannon-Wiener diversity was found in the coastal area, whereas Simpson's dominance was the highest here. Abundant and often dominant species in this area are the crustacean *Urothoe poseidonis*, the polychaetes *Lanice conchilega* and *Spiophanes bombyx*, the molluscs *Ensis americanus* and *Spisula subtruncata* and, to a lesser extent, *Tellina fabula*.

High faunal densities were found at the Dogger Bank and in the northern and eastern part of the Oyster Ground (Table 2, Fig. 6.). Also in the coastal area there were some stations with very high total densities. In the offshore area the densities were almost invariably low, except for station OFF 33 that was, as usual, rich in fauna. At the Dogger Bank and in the offshore and coastal areas polychaetes were the most abundant group. In the Oyster Ground the numbers were more or less equally distributed over the different taxonomic groups, with a slight predominance of echinoderms and molluscs. In neither of the areas a substantial change could be observed compared to previous years (Fig 11).

At the Dogger Bank a clear sign of recovery could be observed of the very low biomass values that were found in 2002 (Table 2, Fig. 12). The low values in 2002 were caused particularly by the absence in the samples of a few polychaete and echinoderm species that usually dominate the fauna in terms of biomass. For example, large specimens of the sea urchin *Echinocardium cordatum* were not found in 2002. Since this is a biomass determining species, its absence was crucial for the mean biomass level in 2002. In 2003 the species returned in the samples. Although only a limited number of specimens was found, they were enough to turn back the trend that was observed in 2002. Based on the size of the specimens of *E. cordatum* found in 2003, one should conclude that they were more than 2 years old (Duineveld & Jenness, 1984). In other words, these animals must have been living at the Dogger bank already in 2002. This suggests that the species was, in fact, not actually absent during a short period, but most probably just absent in the samples by incident. Particularly at the Dogger Bank, where *E. cordatum* is not particularly abundant and where the number of samples (7) is low, the occurrence of incidental high or low biomass values is, therefore, to be expected. This also illustrates that an apparent short-term trend in biomass is not always necessarily and/or completely explained by an actual increase or decrease of one or more biomass determining species. Especially when the number of samples is low (like at the Dogger Bank) the occurrence of incidental outliers can be expected.

In the Oyster Ground, there seemed to be a decrease in biomass after a peak value in 2002. However, the high mean biomass value of 2002 was explained completely by the occurrence of one very large specimen of the otter-shell (*Lutraria lutraria*) in the sample

collected at station OYS 24. When the finding of this specimen is ignored, the previously detected trend of a slight but continuous increase of biomass from 1997 onwards seems to have continued in 2003.

In the coastal area there was a strong increase in biomass to the very high mean value of 142 g AFDW per m². This increase was caused by the biomass increase of the bivalve *Ensis americanus*. This species had a very succesful spatfall in 2001 and in spring 2002 large numbers of juvenile specimens were found at several stations. In 2003 the densities were still high, but now the juveniles of 2002 had grown up to a size of 5 to 10 cm, which explains the strong biomass increase.

5.2.2. TEMPORAL VARIATION IN DENSITY AND BIOMASS OF INDIVIDUAL SPECIES

Figs. 13-16 illustrate the temporal variation in density or biomass of a number of individual species in the 4 subareas during the period 1986-2003.7

Dogger Bank (Fig. 13a-c)

Of the 12 species for which the time series is illustrated there are only a few that showed a more or less trendwise development. The sand star *Acrocnida brachiata* and the bivalve *Mysella bidentata* have shown decreasing abundance since 1999. Densities were still low in 2003. The amphipod *Bathyporeia elegans* has, after peak abundance in 2000, continuously decreased. Finally, the polychaete *Aricidea minuta*, which gradually disappeared by the end of the nineties, was still absent in 2003.

A species of which no living specimens were found before during the BIOMON-programme is the bivalve *Tridonta montagui*. In 2003 6 specimens were found at the most northern station DOG 1. It's occurrence is not surprising since empty shells have been found several times before. Moreover, the species was known from a beam trawl haul in the seventies (van Noort et al., 1986), from the Synoptic Mapping (de Wilde & Duineveld, 1988) and from the BEON-97 programme (Bergman & van Santbrink, 1998). All three records originate from the most northern part of the Dutch part of the Dogger Bank. Apparently, the distribution of *T. montagui* in the Dutch sector is limited to this small area. Another species that is new to the Dogger Bank is the polychaete *Rhodine loveni*. It has been found three times before during BIOMON, but all records are from the Oyster Ground. Finally, the sand worm *Echiurus echiurus*, a member of the small phylum *Echiurida*, was not found before during the BIOMON programme. Remarkably, this species was found at 5 stations in the offshore area, the Oyster Ground and the Dogger Bank, and at several stations in the adjacent German sector during the Synoptic Mapping

in 1986 (de Wilde & Duineveld, 1988). It seems likely that 1986 has been an incidental peak year for this species. Living specimens of *E. echiurus* have further been found washed ashore near Katwijk (Adema, 1978a) and near Wijk aan Zee (Slager, 1982).

In our previous report we mentioned the occurrence of the bivalve *Gari costulata* as a species new to the Dogger Bank. However, we have shown the specimens we collected till now to the taxonomist R. de Bruyne and he reidentified them as juvenile *Gari fervensis*, a species well known from the Dogger Bank and the Oyster Ground.

Oyster Ground (Fig. 14a-c)

Most species in the Oyster Ground showed more or less stable densities compared to the preceding years. It seems that the decrease in silt contents in the top layer of the sediment (see chapter 5.1) did not have substantial consequences for the most common species. It is true that the polychaete *Chaetopterus variopedatus* showed a decrease in recent years and that this decrease continued in 2003. However, there is no strong indication that the low silt contents should be responsible for this decrease, since the decrease started in 2001, when the silt concentrations were still at a high level.

A number of species had not been observed in the Oyster Ground before. At station OYS 7 two polychaete species were found, for which we could not find any record from the Dutch sector. These species are *Brada villosa* and *Pherusa plumosa*. Both were known to occur near the British east coast (Caddy et al., 1977). A third species at this station, the polychaete *Polyphysia crassa* was never found during BIOMON, but was found at two stations in the Oyster Ground during the Synoptic Mapping (de Wilde & Duineveld, 1988) and was once observed here during the MILZON programme (Holtmann & Groenewold, 1992). Another polychaete species new within BIOMON is *Drilonereis filum*. However, there are several records of this species from the Oyster Ground from previous studies, e.g. Wapenaar (1981, unpubl. data), the Synoptic Mapping (deWilde & Duineveld, 1988) and the MONMIJ studies (Daan & Mulder, 1990, 1991, 1995). A crustacean species we never found before was *Leptognathia* spec.. We could not identify it to species level, but even about the genus we could not find any record from the North Sea. At one station 73 juvenile specimens of *Echiurus echiurus* (Phylum Echiurida) were found. Formerly, this species was only known from the Synoptic Mapping. At another station the Tunicate *Pelonaia corrugata* was found, previously only known from the Synoptic Mapping and the BEON-97 programme (Bergman & van Santbrink, 1998).

Finally, two species that had been found in the Dutch sector for the first time in 2002 were found again in 2003: the crustacean *Bopyrus squillarum* and the polychaete *Lagisca extenuata*. *B. squillarum* was observed in 2002 also in the Oyster Ground but *L.*

extenuata was found then in the offshore area. The latter species appears in fact to be not completely new to the Dutch fauna, since it has been observed at three locations in the Delta area in the sixties, *i.e.* in the mouths of the Brouwershavense Gat, the Oosterschelde and the Westerschelde (W. Wolff, pers. comm.). Further the species has been found ashore at Tholen (Adema, 1978b) and near Hoek van Holland and Goes (Anonymus, 1991).

Offshore area (Fig. 15a-c)

The plots of the population densities of 12 of the commonest species show that most populations fluctuate around an average level, without showing a clear long term trend. There were, however, some polychaete species that showed a slight indication of a short-term trend. *Nephtys cirrosa* showed a slight but continuous increase from 1999 onwards, without reaching extremely high densities. On the other hand there was a weak tendency for decreasing abundance of *Chaetozone setosa*, *Lanice conchilega* and *Spiophanes bombyx* (note the logarithmic scale). As suggested in chapter 5.2.1 a decrease of these species could have contributed significantly to the decrease of Simpson's dominance in the offshore area.

The station OFF 33, west of IJmuiden was in 2003, like in preceding years, very rich in fauna. In the sample from this station 38 species occurred. This time there were no deviant faunal elements (like hard substrate dwellers). The area immediately south of OFF 33 appeared to be extremely poor in fauna. Although it is known that this area is not particularly rich, the mean number of species per sample was in the preceding years always well beyond 10 (see text table below). In most years there was only 1 or a few stations where less than 10 species were found. In 2003 only one station yielded more than 10 species (OFF 19 with 11 species) and the average number was at the very low level of 6.8 species per sample. It is not clear what can be the cause of these low numbers. The excercition of 2004 may tell us, whether the low numbers mark the onset of a trendwise decrease.

Monitoring macrozoobenthos North Sea 2003

station	number of species per sample in the south western offshore area								
	1995	1996	1997	1998	1999	2000	2001	2002	2003
OFF17	11	5	9	5	16	12	6	9	6
OFF18	16	5	11	6	13	5	9	13	6
OFF19	24	12	16	8	9	3	11	15	11
OFF20	16	15	15	14	15	11	12	17	6
OFF21	19	14	12	18	17	22	14	12	8
OFF26	13	11	13	12	11	13	5	7	5
OFF27	10	18	10	25	5	14	15	8	4
OFF28	22	22	15	12	8	14	11	11	7
OFF35	19	14	21	16	10	27	15	18	8
OFF36	23	18	17	8	12	13	19	12	7
mean:	17.3	13.4	13.9	12.4	11.6	13.4	11.7	12.2	6.8

There were two species that, within the BIOMON programme, had not been found before in the offshore area. Both were found in the north-western part of the offshore area. For the sea spider *Endeis spinosa* there is one record from the Dutch sector, which originates from the southern Oyster Ground (Mulder *et al.*, 1988). The other species was the crustacean *Stenula rubrovittata*. This amphipod is known to live often in association with the hermit crab *Pagurus bernhardus* (Lincoln, 1979). It can be no incident, therefore, that *P. bernhardus* was present in the same sample. Within BIOMON *S. rubrovittata* has once been observed on the Doggerbank (Holtmann *et al.*, 1998). Further there is one record from the offshore area (Mulder *et al.*, 1987).

Coastal area (Fig. 16a-c)

In the sea urchin *Echinocardium cordatum* there seemed to be a slight numerical decrease and a rather strong decrease in biomass compared to the preceding years. The decrease in biomass was due to the fact that there were only a few large specimens (> 3cm) in the samples in 2003. The amphipod *Urothoe poseidonis*, which has shown an increase from 1998 onwards, continued this increase in 2003. The densities of the polychaete *Nephtys cirrosa*, which were at a high level during the first half of the nineties but collapsed in 1996, were still at a low level. Still there seems to be a slow but steady recovery in the numbers of this species. Since in recent years such signs of recovery were observed also in the offshore area and at the Dogger Bank, the trend seems to cover the whole Dutch sector.

A species that substantially increased in 2002 was the american razor clam *Ensis americanus*. At 6 stations large numbers of juveniles were found in 2002, that must have settled there in 2001. At 5 of these stations these 'banks' of *E. americanus* were also found in 2003, but the animals had grown considerably, so biomass had substantially increased. The observations provide the opportunity to compare growth rates at the different stations (Fig. 17). The size of the juveniles found in 2002 was not the same at the different stations. The banks near Ameland, IJmuiden and Vorne-Putten contained shells with an average size of about 35 mm. At Terschelling and Noordwijk the juveniles had grown to an average size of 45 mm in their first season. There are two possible explanations for this difference. One is that feeding conditions were more favourable at the latter two stations. The other is that settlement of the larval stages in 2001 did not take place at the same moment at the different stations. It is conceivable that settlement at Terschelling and Noordwijk took place earlier than at the other stations so that growth occurred over a longer season. During the second season there were also differences in growth, but there was another differentiation between stations. In terms of shell length growth was the slowest near Ameland and Terschelling and the fastest near IJmuiden and Noordwijk. At Ameland and Terschelling the average increase in shell length was 25 mm and 30 mm respectively. This means that in terms of biomass the increase at Terschelling must have been larger than near Ameland. There is, however, a factor that may have suppressed growth at both locations. The high density at both locations and in both years may have led to considerably enhanced intraspecific competition for space and food. This competition becomes probably the stronger as the size of the individuals increases. At IJmuiden and Noordwijk the shell length increase was on average 60 mm and 50 mm respectively. At these stations the densities were clearly lower and the effect of intraspecific competition will have been much less here.

One species was found that has not been observed before within the BIOMON program. The crustacean *Phthisica marina* was found at COA 13, which had, as usual, the poorest fauna. The species has been observed before in the coastal area by Aquasense (1997), who found it off the coast near Scheveningen. Further there is a record from the northwestern part of the offshore area (Mulder et al., 1987) and one old record from the Oosterschelde area (Vader, 1966).

6. Acknowledgements

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Tables and Figures

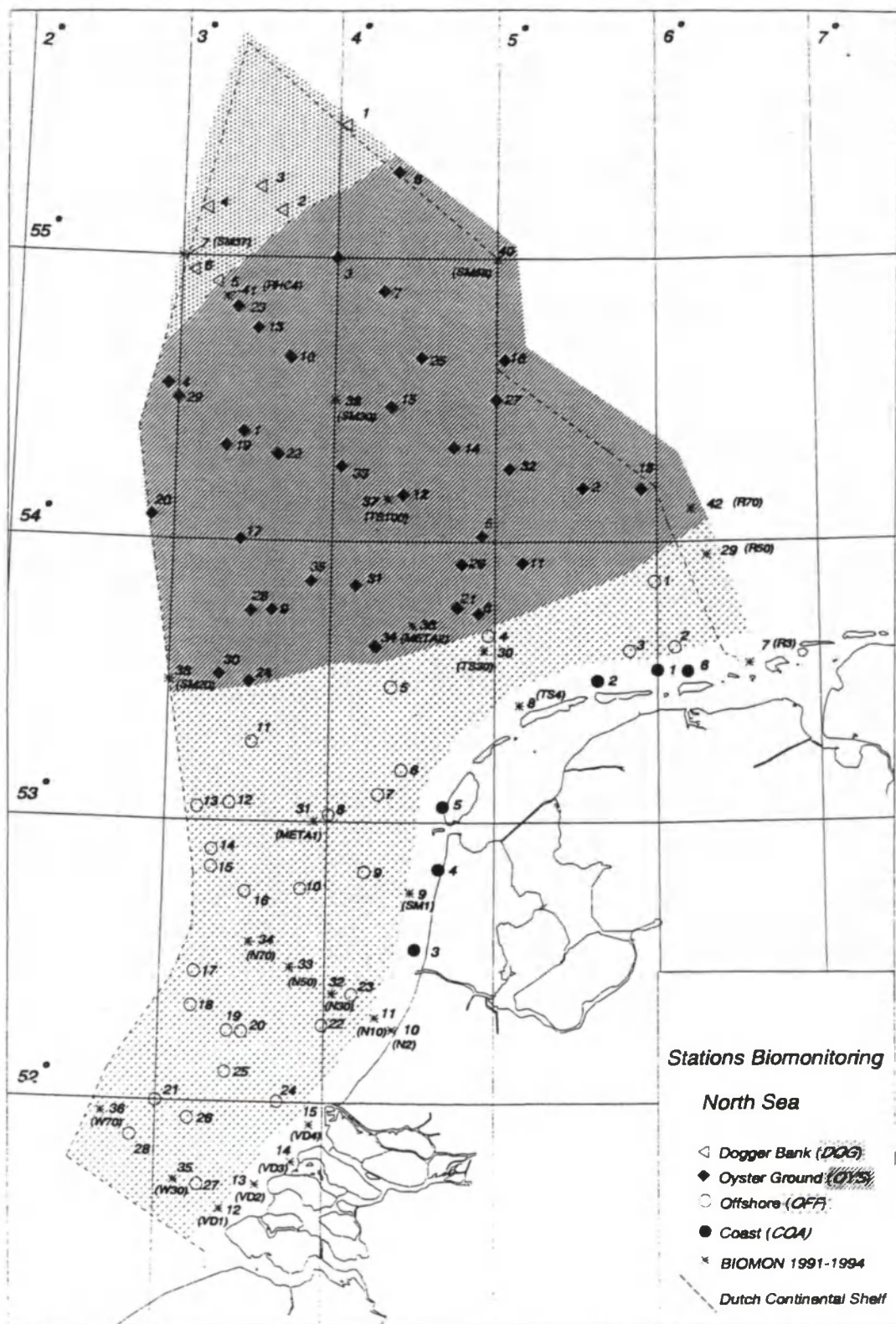


Fig. 1. Locations of the sampling stations

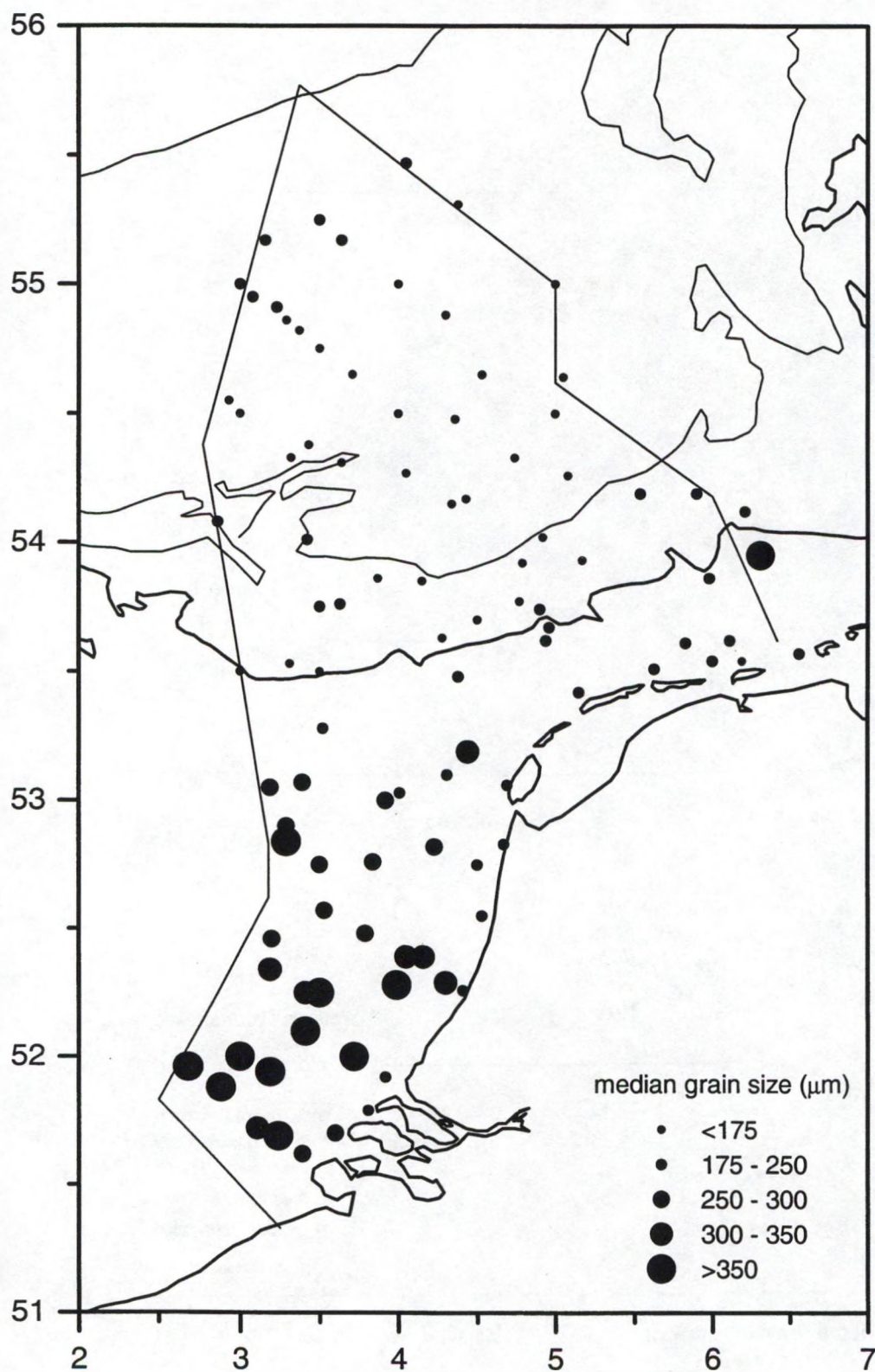


Fig. 2: Median grain size (μm) of the sediment in 2003

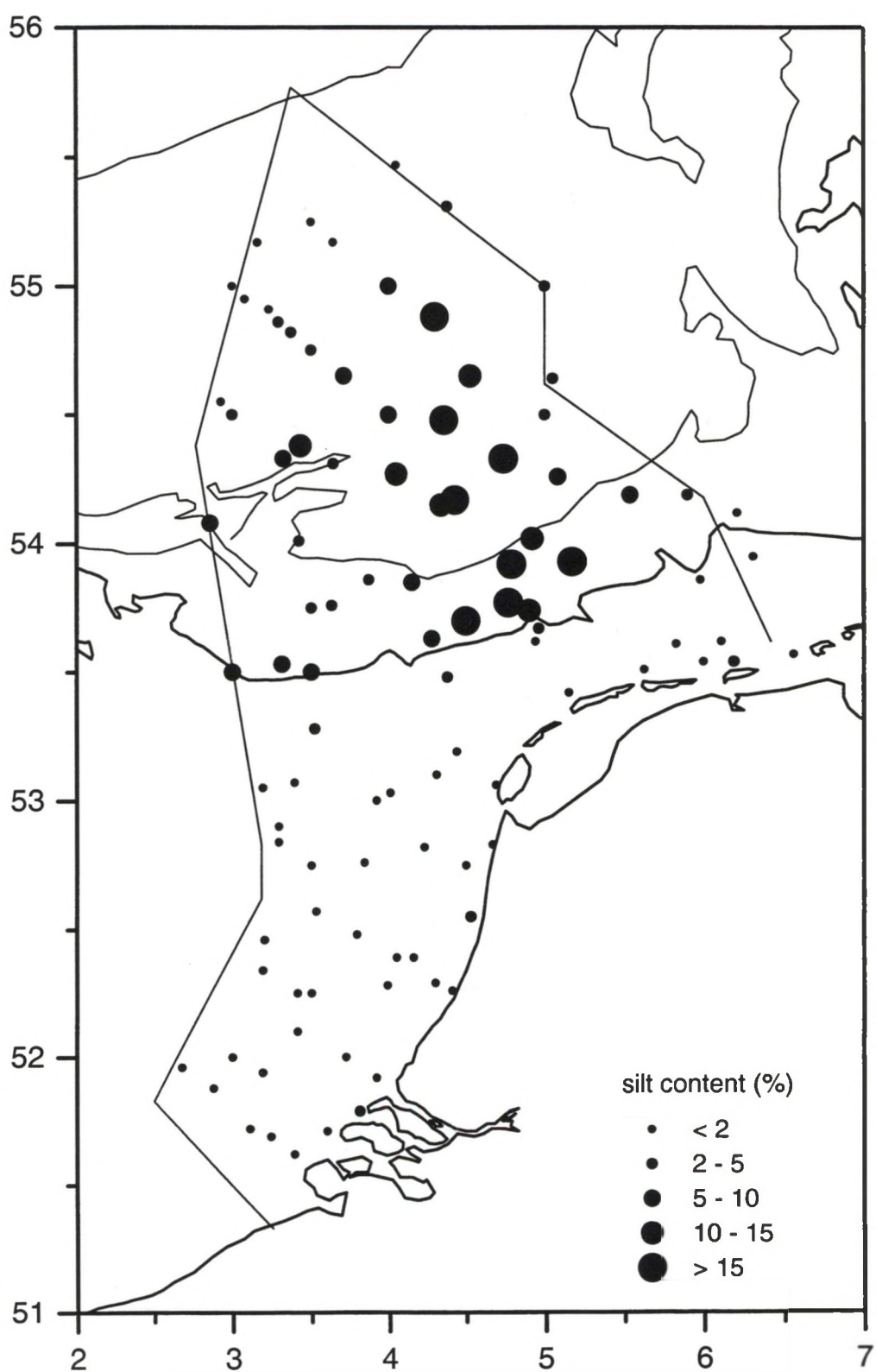


Fig. 3: Silt content (fraction <63 μm) of the sediment in 2003.

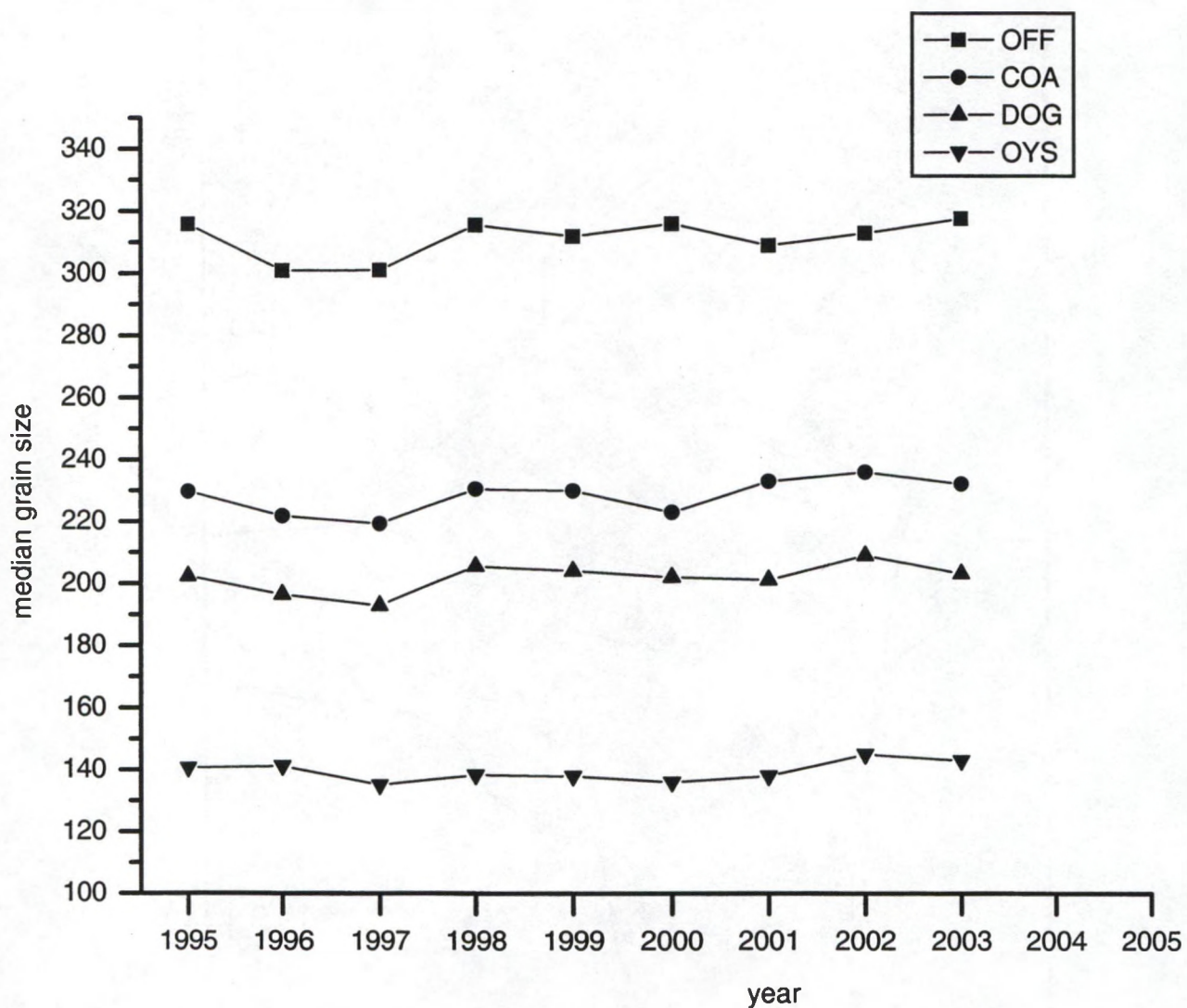


Fig. 4: Temporal trends in the mean median grain size in the four subareas.

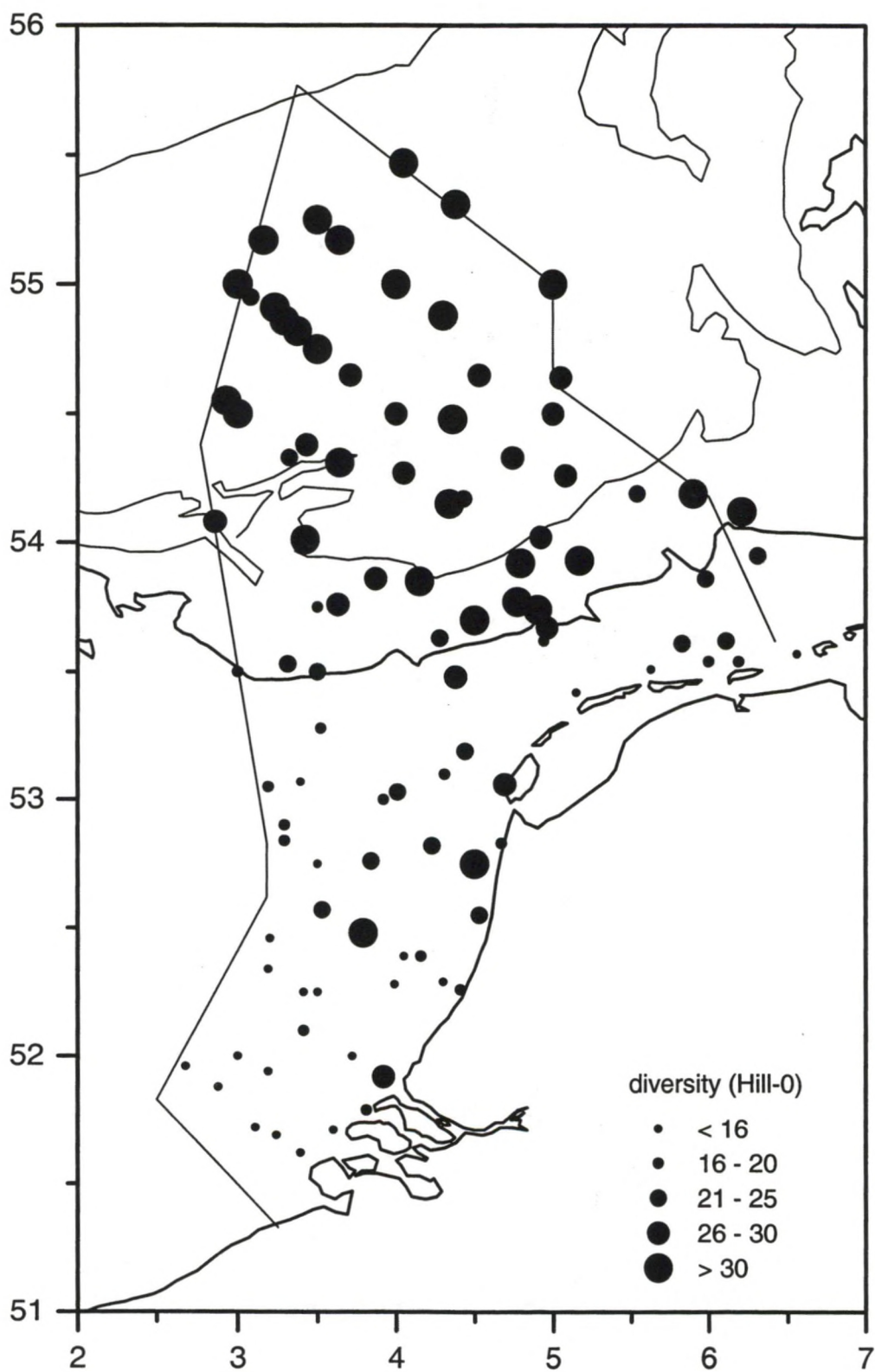


Fig. 5: The number of species per sample (Hill-0) in 2003.

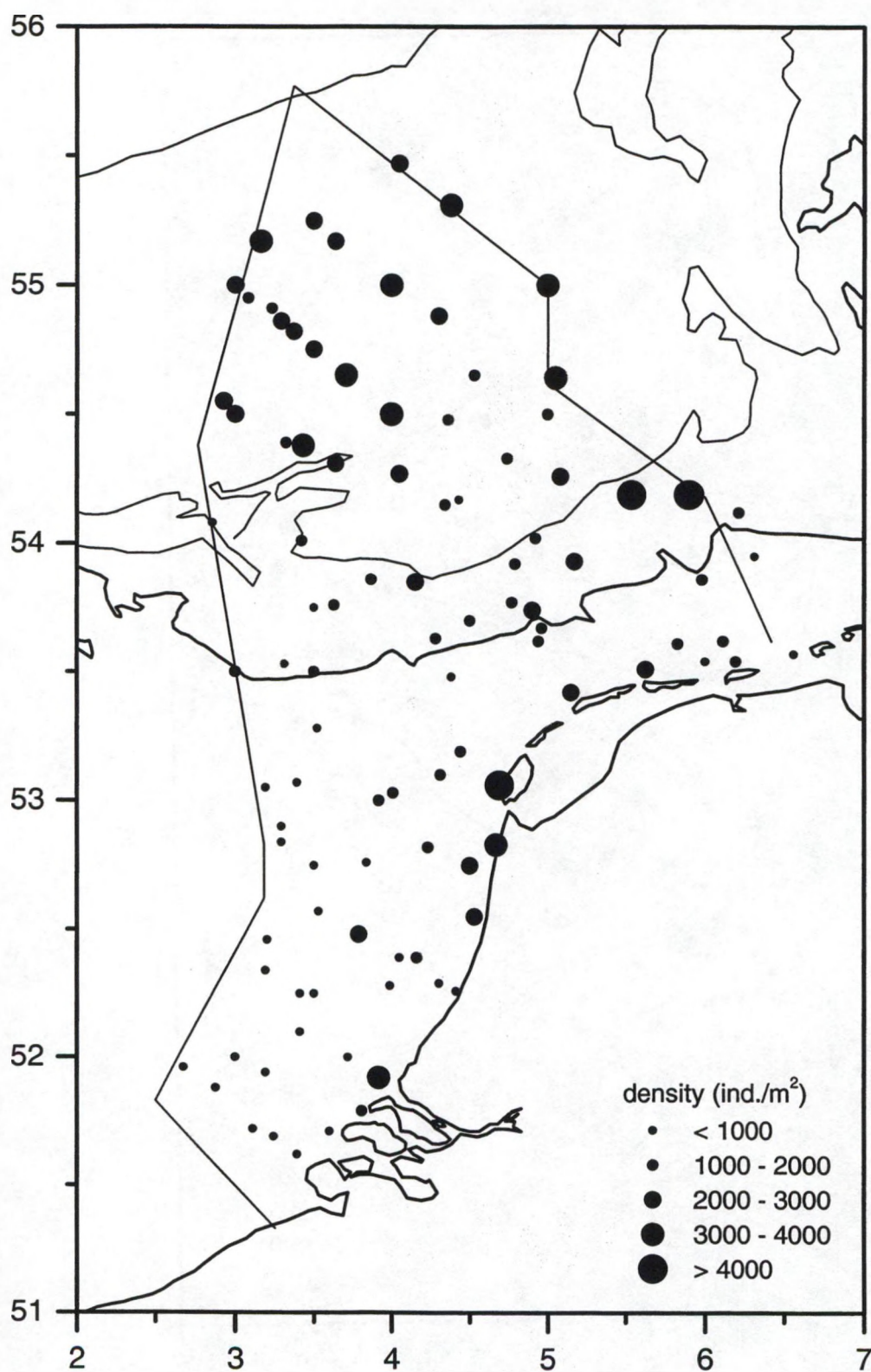


Fig. 6: The total fauna density in 2003.

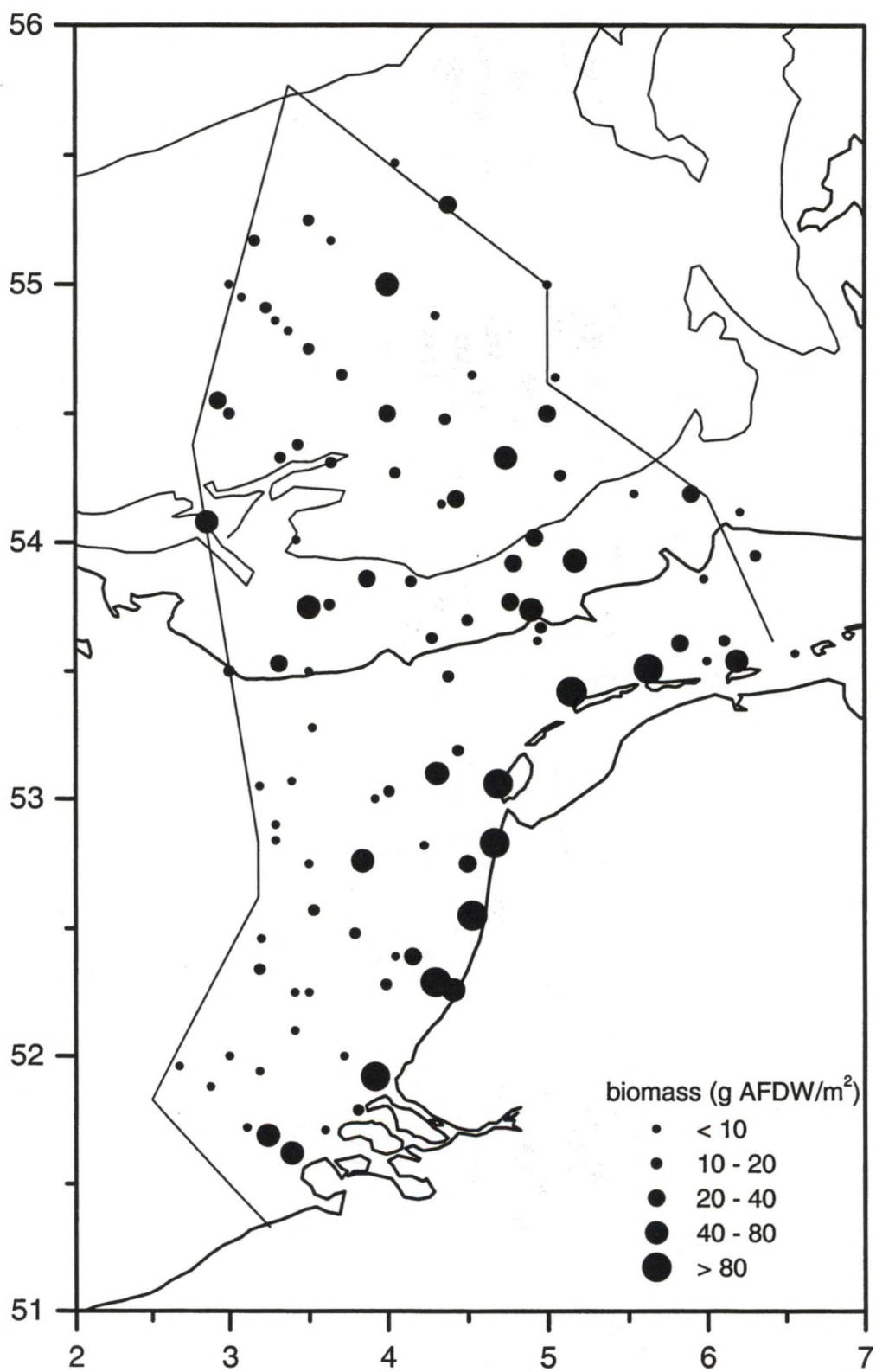


Fig. 7: The total biomass (g AFDW/m²) of the macrobenthos in 2003.

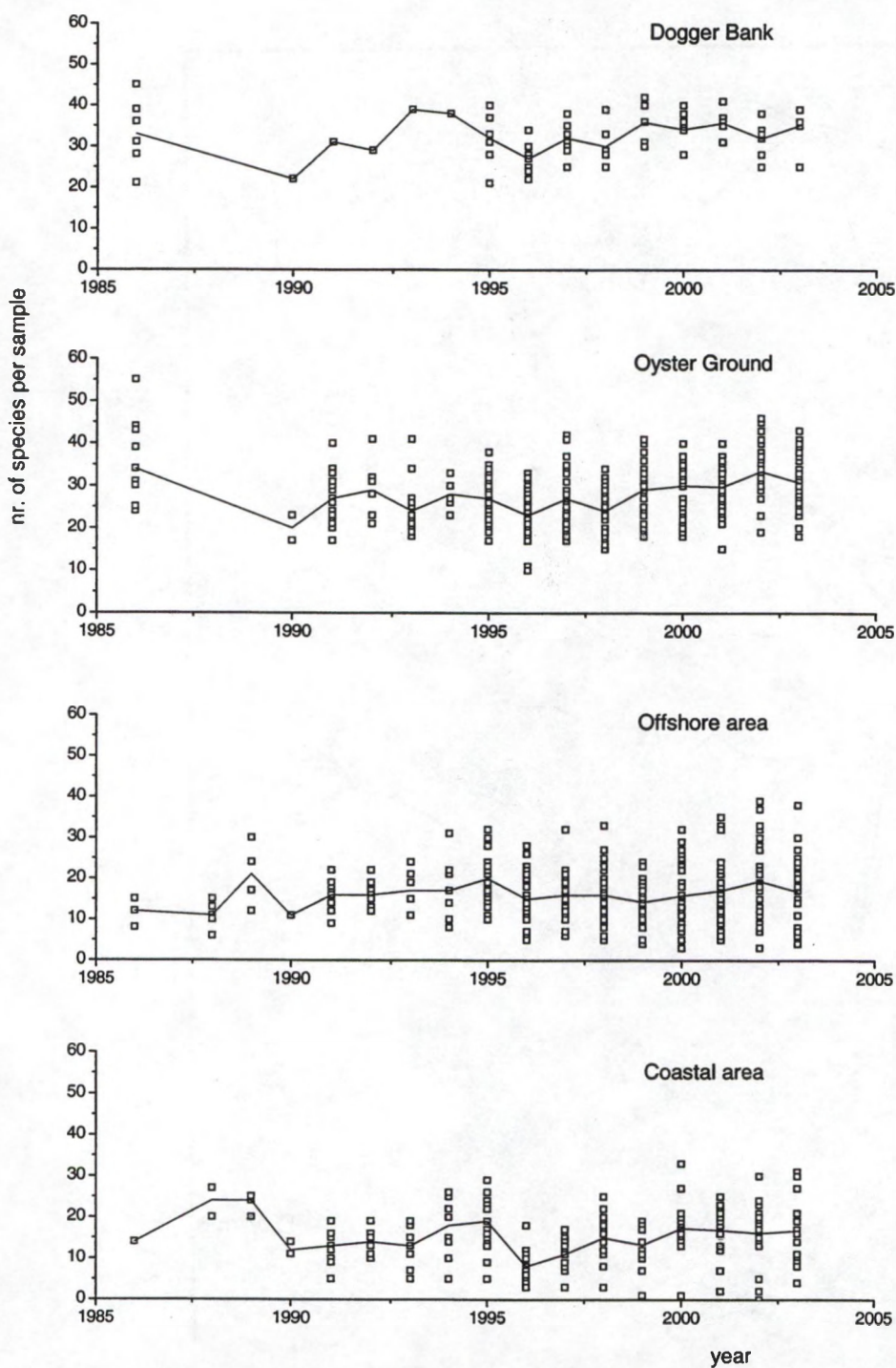


Fig. 8: Temporal patterns in species richness (Hill-0) between 1986 and 2003.

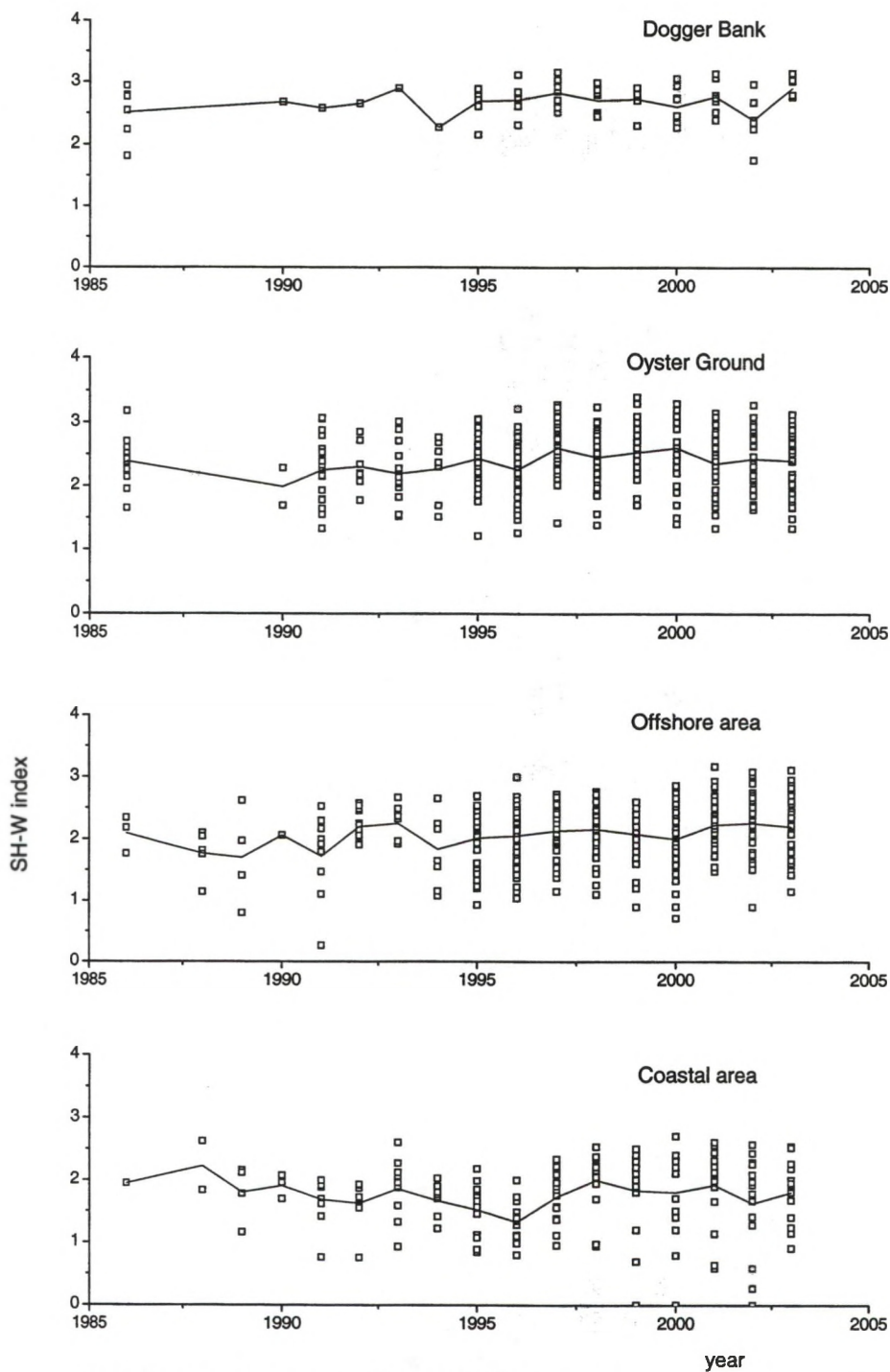


Fig. 9: Temporal patterns in Shannon-Wiener diversity between 1986 and 2003.

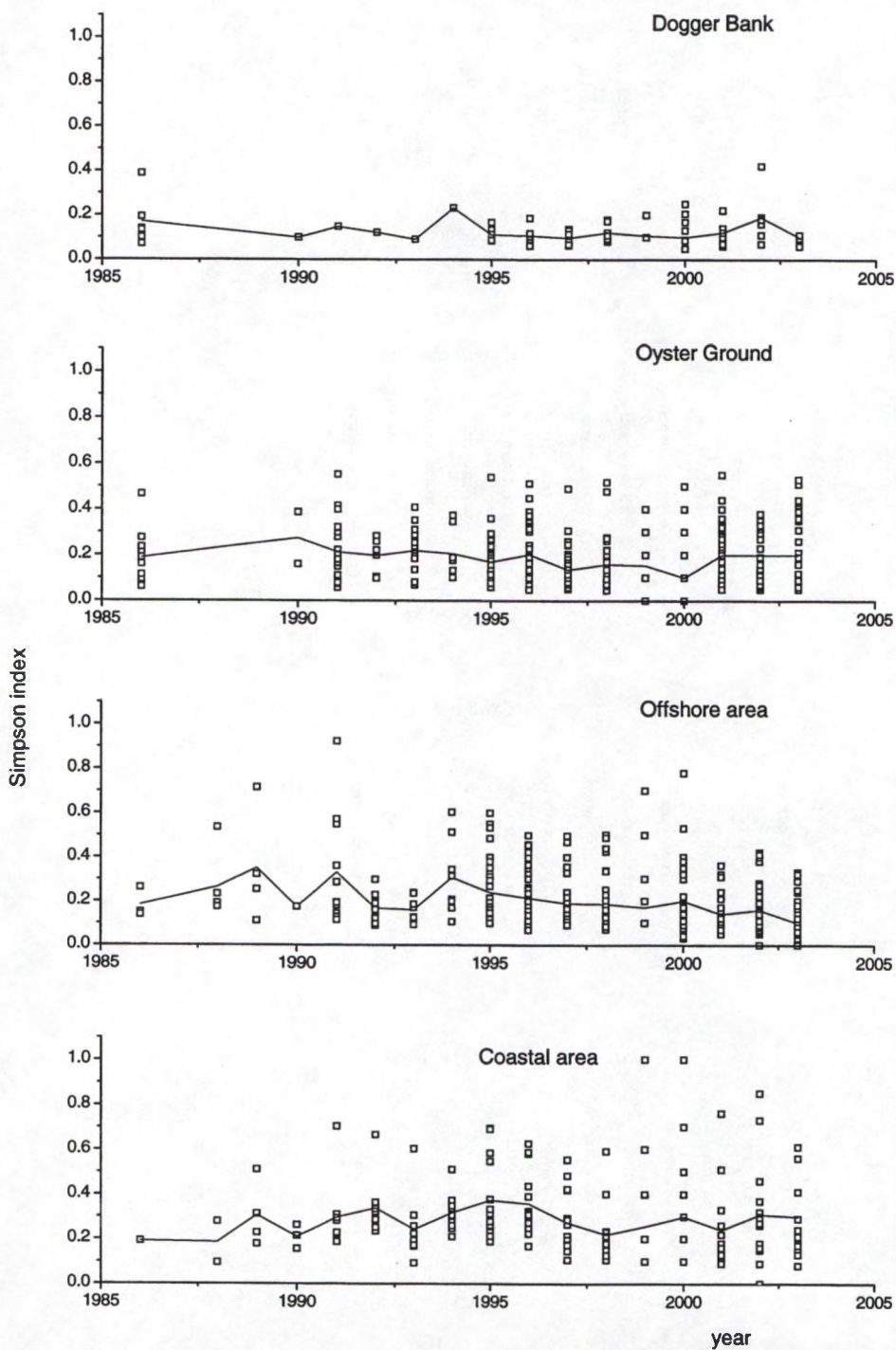


Fig. 10: Temporal patterns Simpson's dominance between 1986 and 2003.

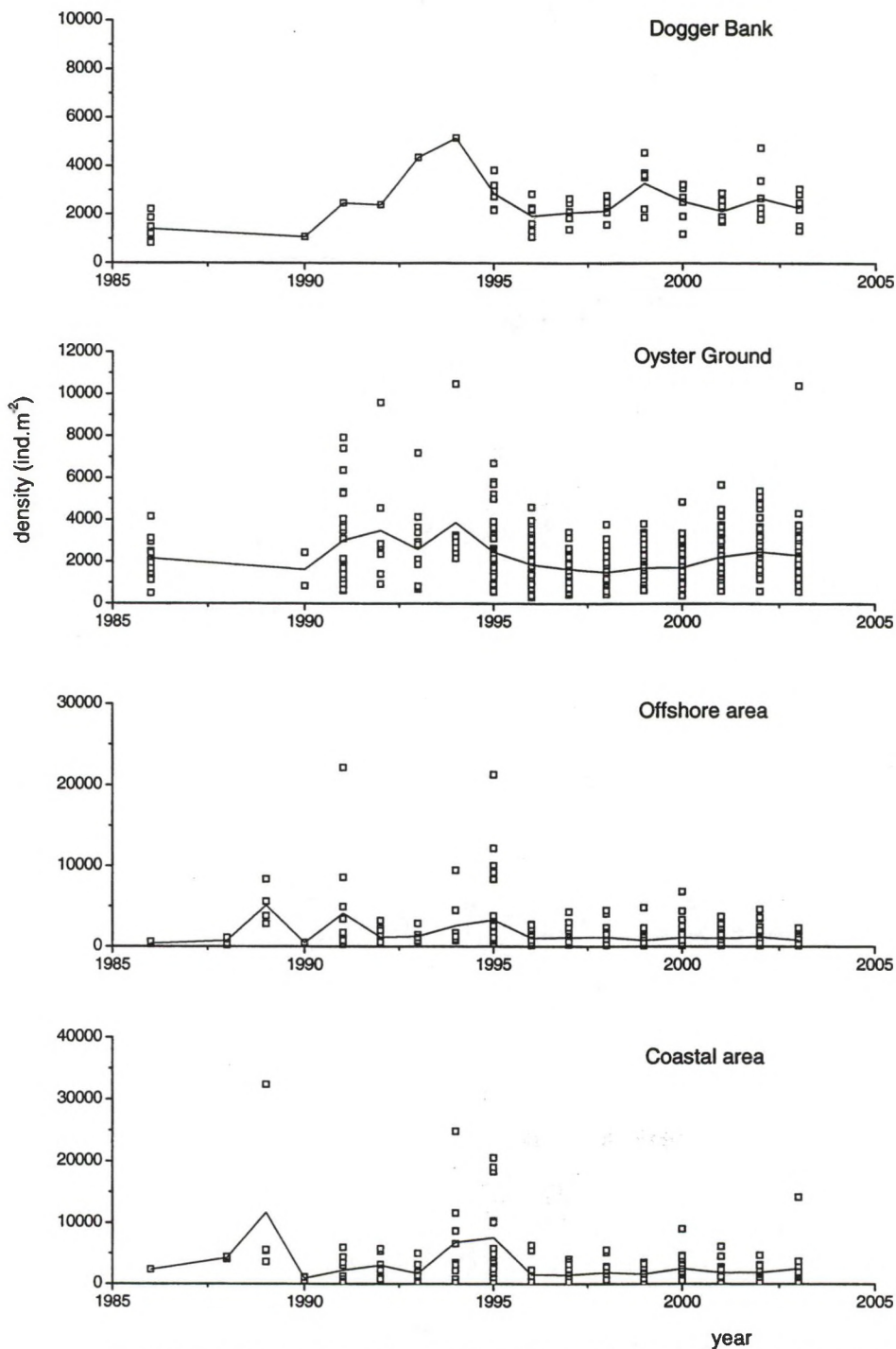


Fig. 11: Temporal patterns in macrobenthos density between 1986 and 2003.

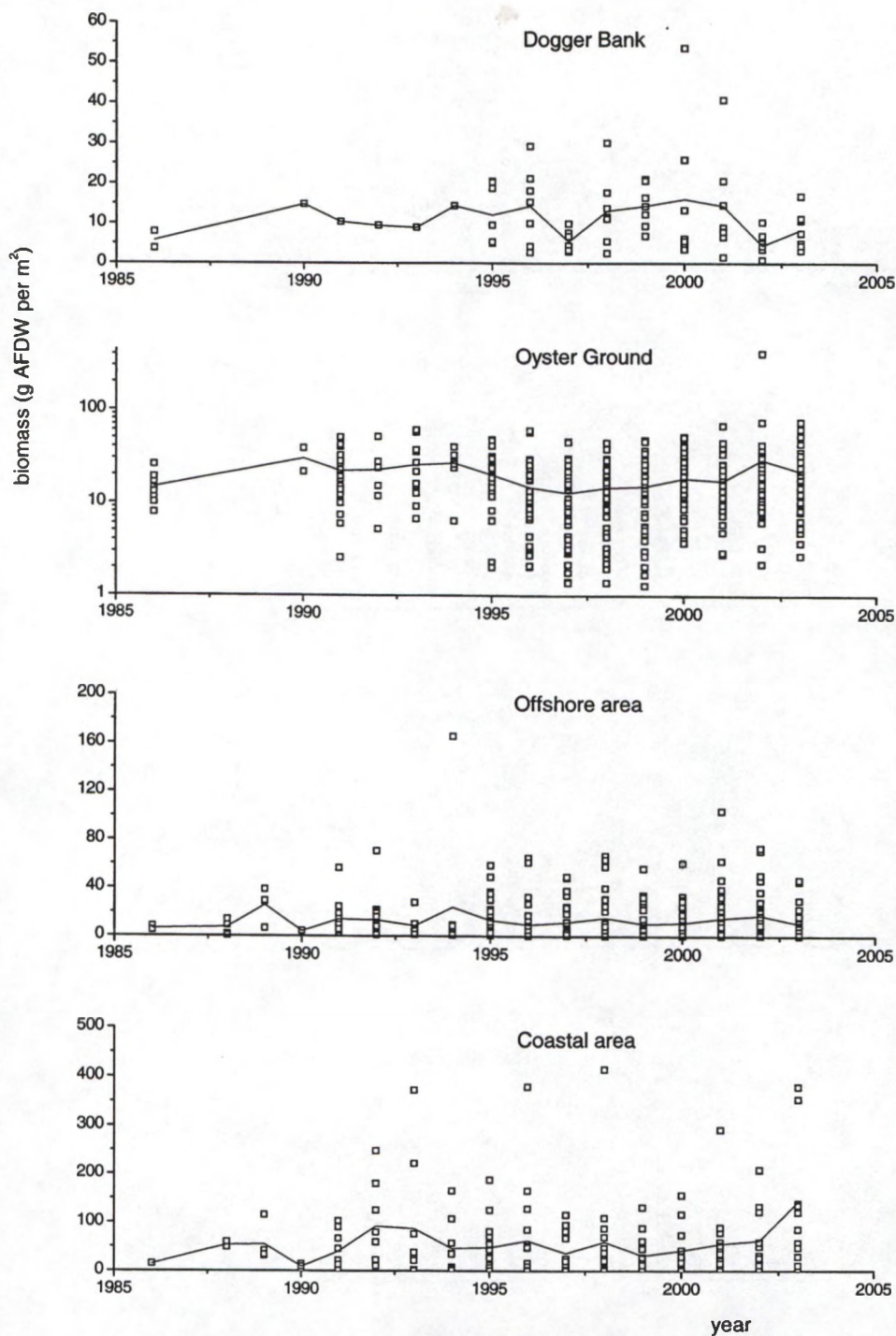


Fig. 12: Temporal patterns in biomass between 1986 and 2003.

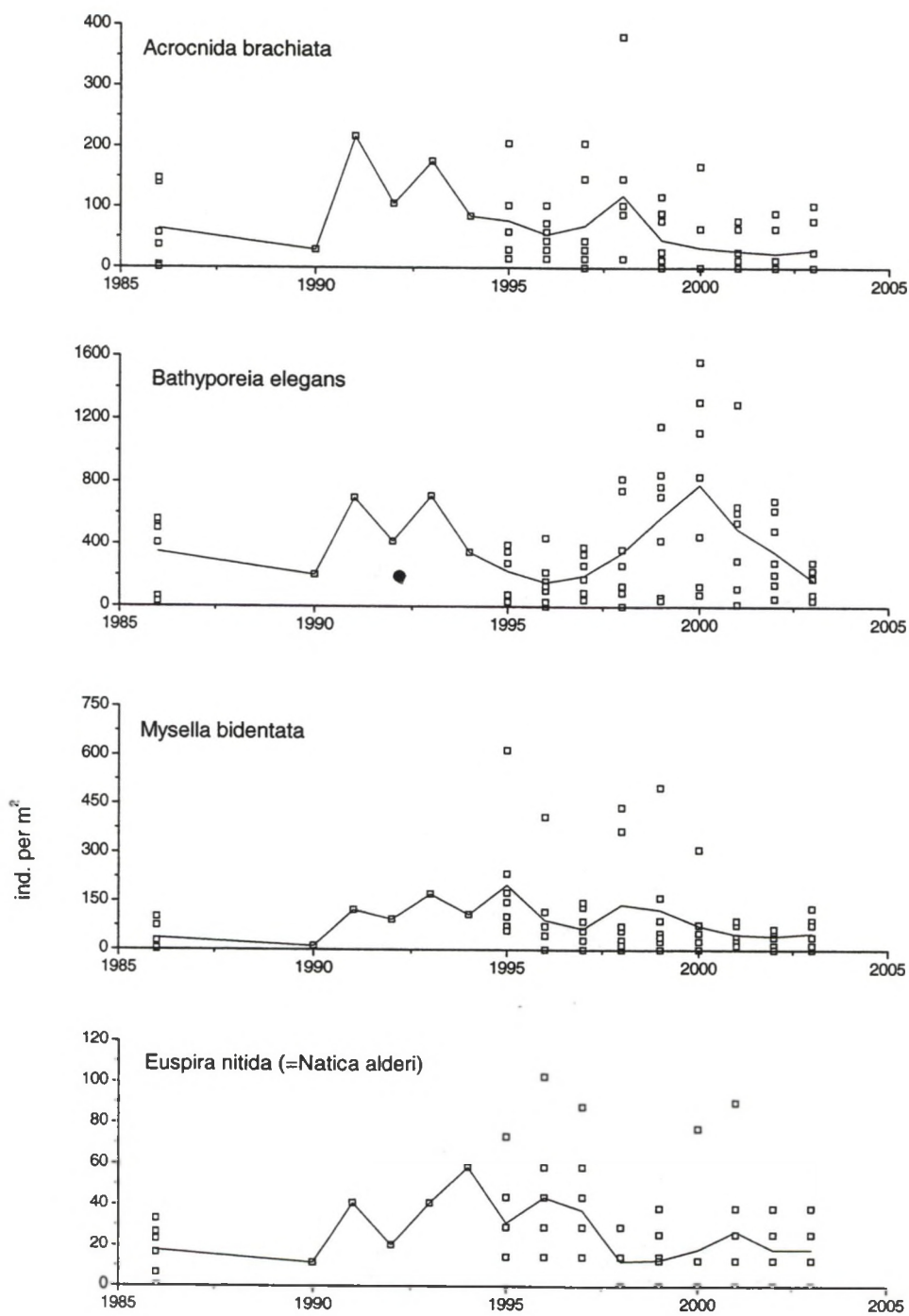


Fig. 13a: Densities of 4 species at the Dogger Bank (1986-2003)

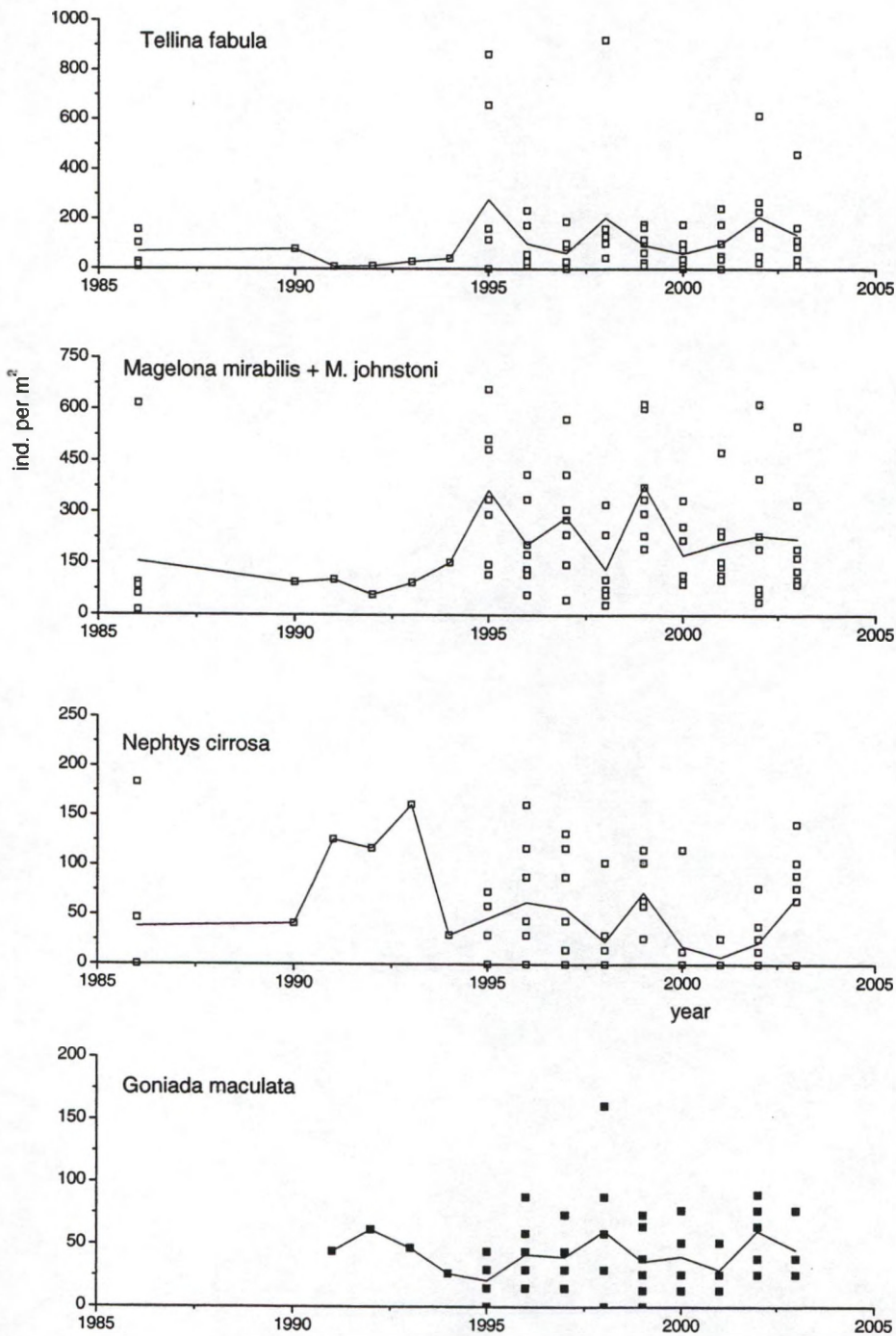


Fig. 13b: Densities of 4 species at the Dogger Bank (1986-2003)

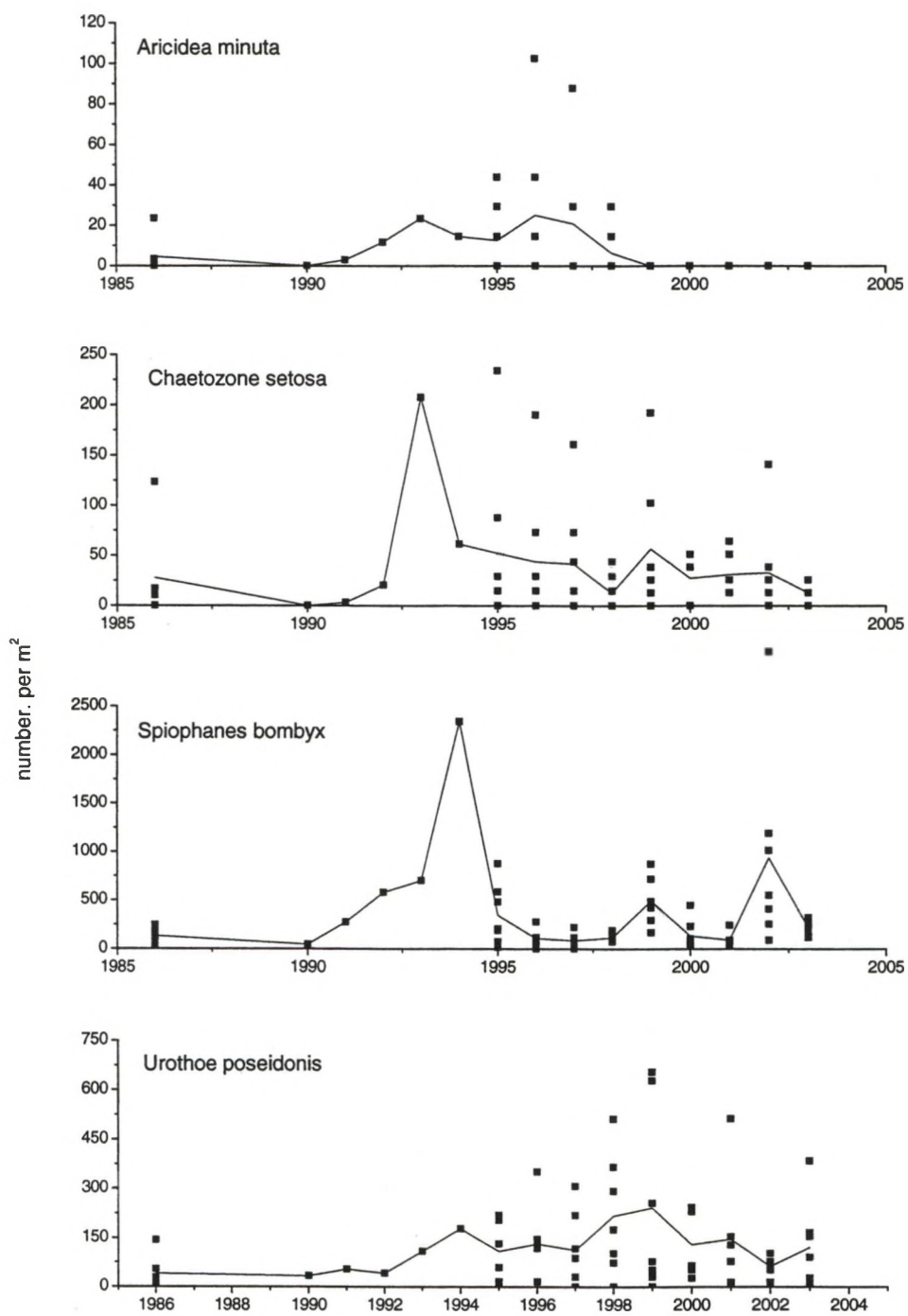


Fig. 13c: Densities of 4 species at the Dogger Bank (1986-2003)

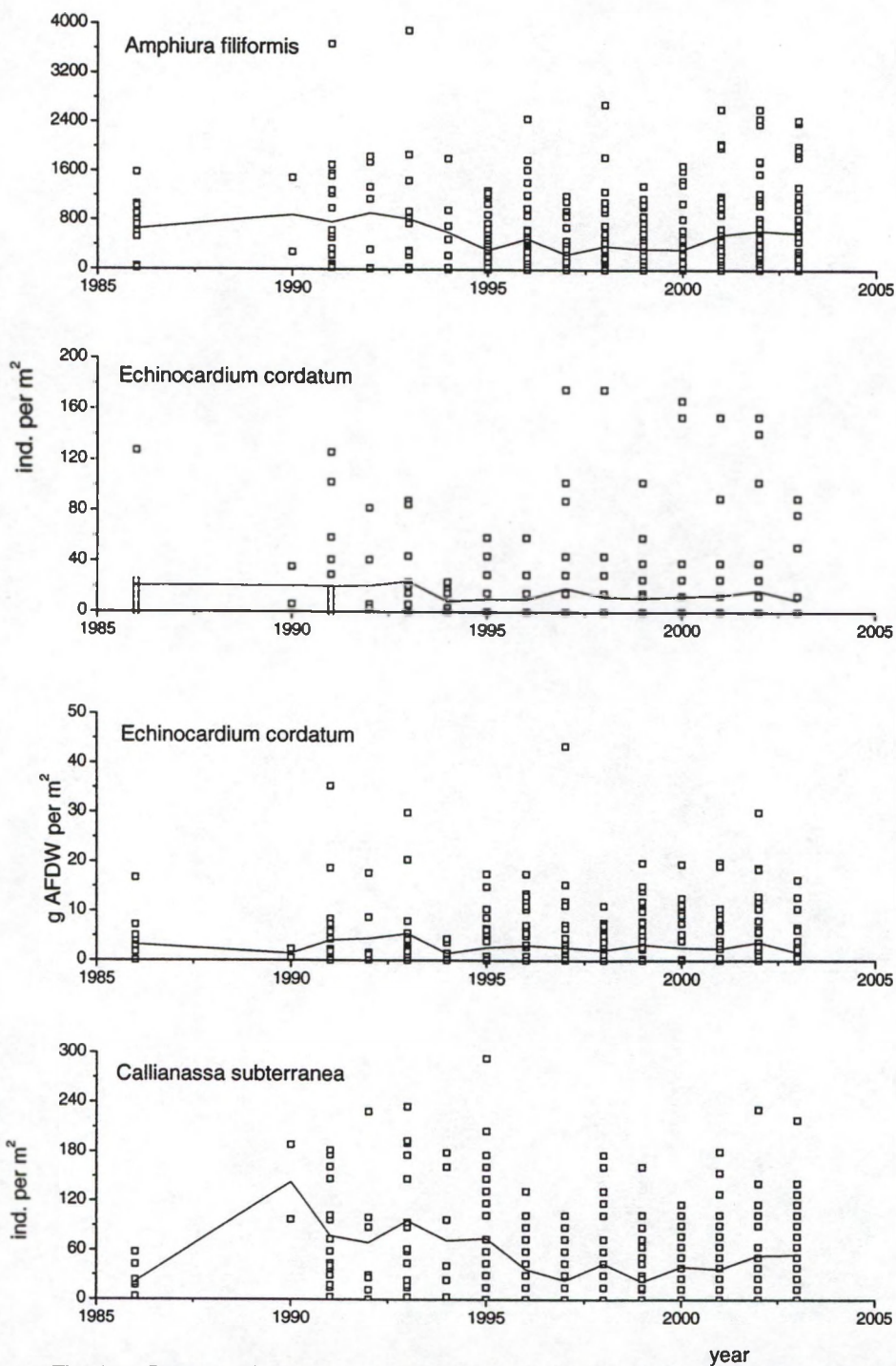


Fig. 14a: Densities (and biomass for *E. cordatum*) of 3 species in the Oyster Ground (1986-2003).

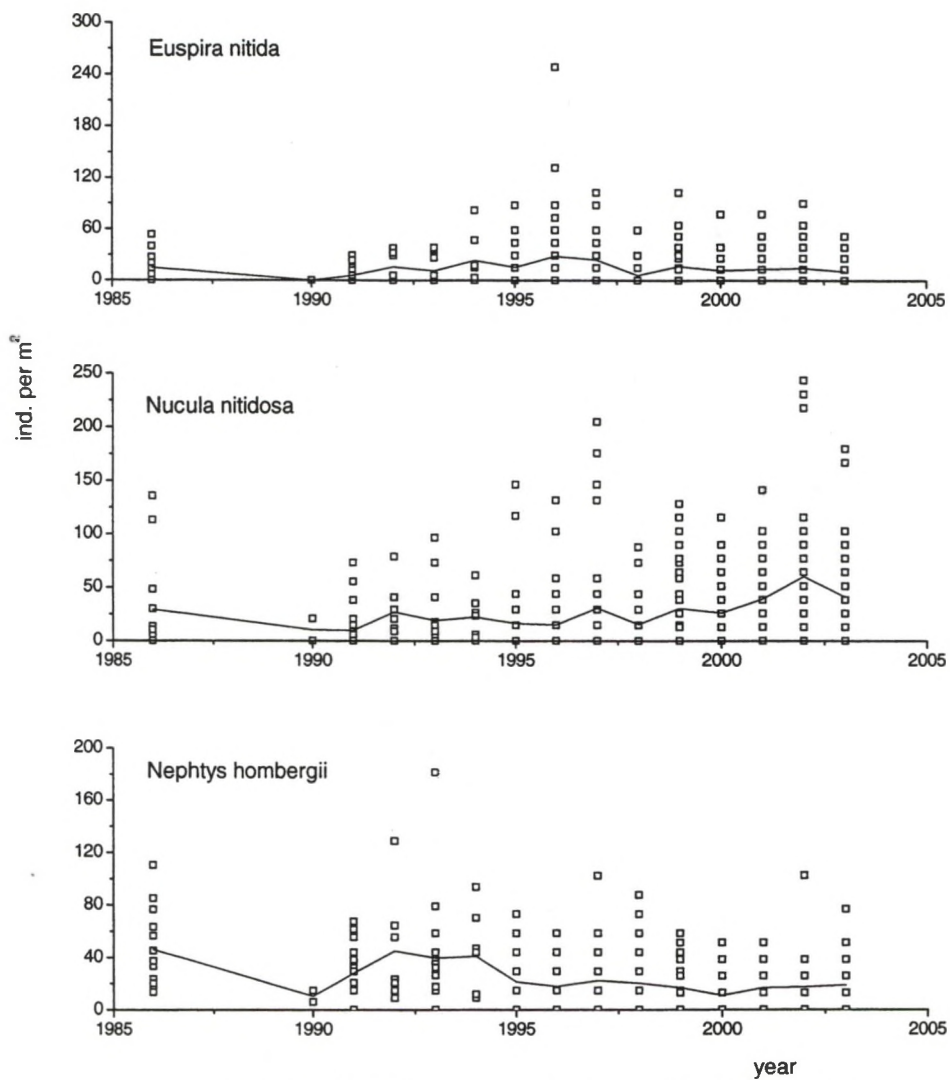


Fig. 14b: Densities of 3 species in the Oyster Ground (1986-2003)

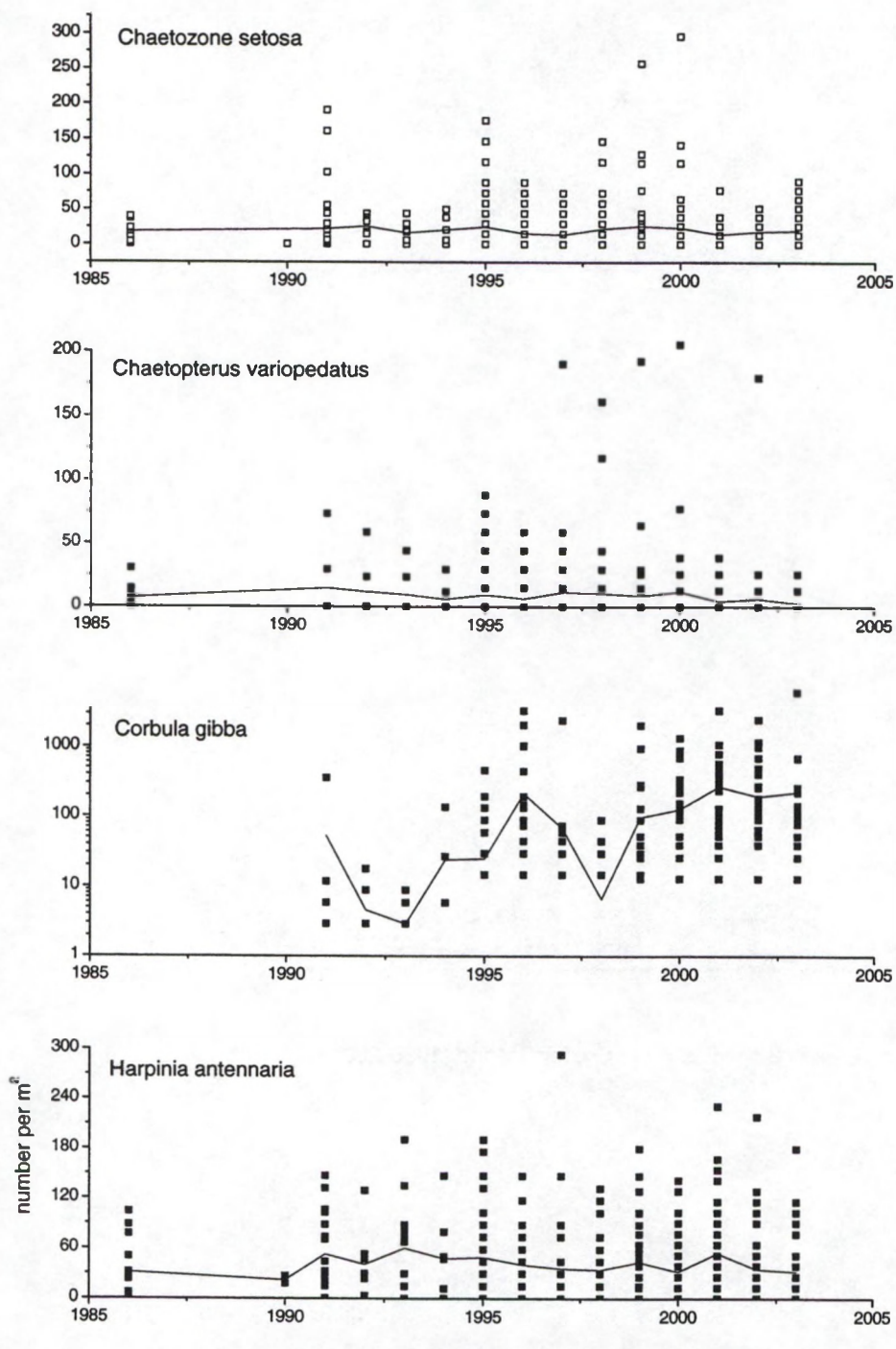


Fig. 14c: Densities of 4 species in the Oyster Ground (1986-2003).

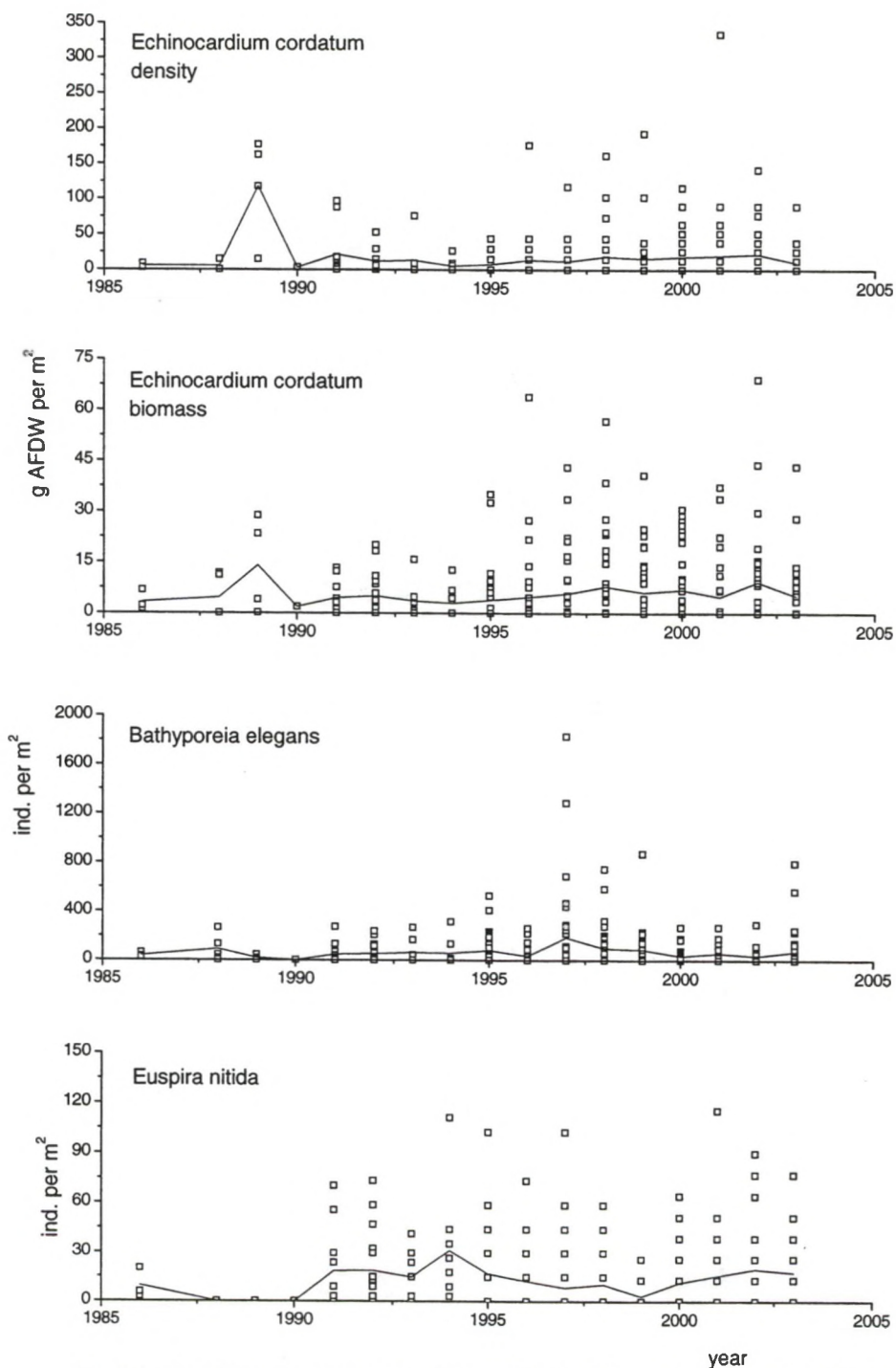


Fig. 15a: Densities (and biomass of *E. cordatum*) of 3 species in the offshore area (1986-2003).

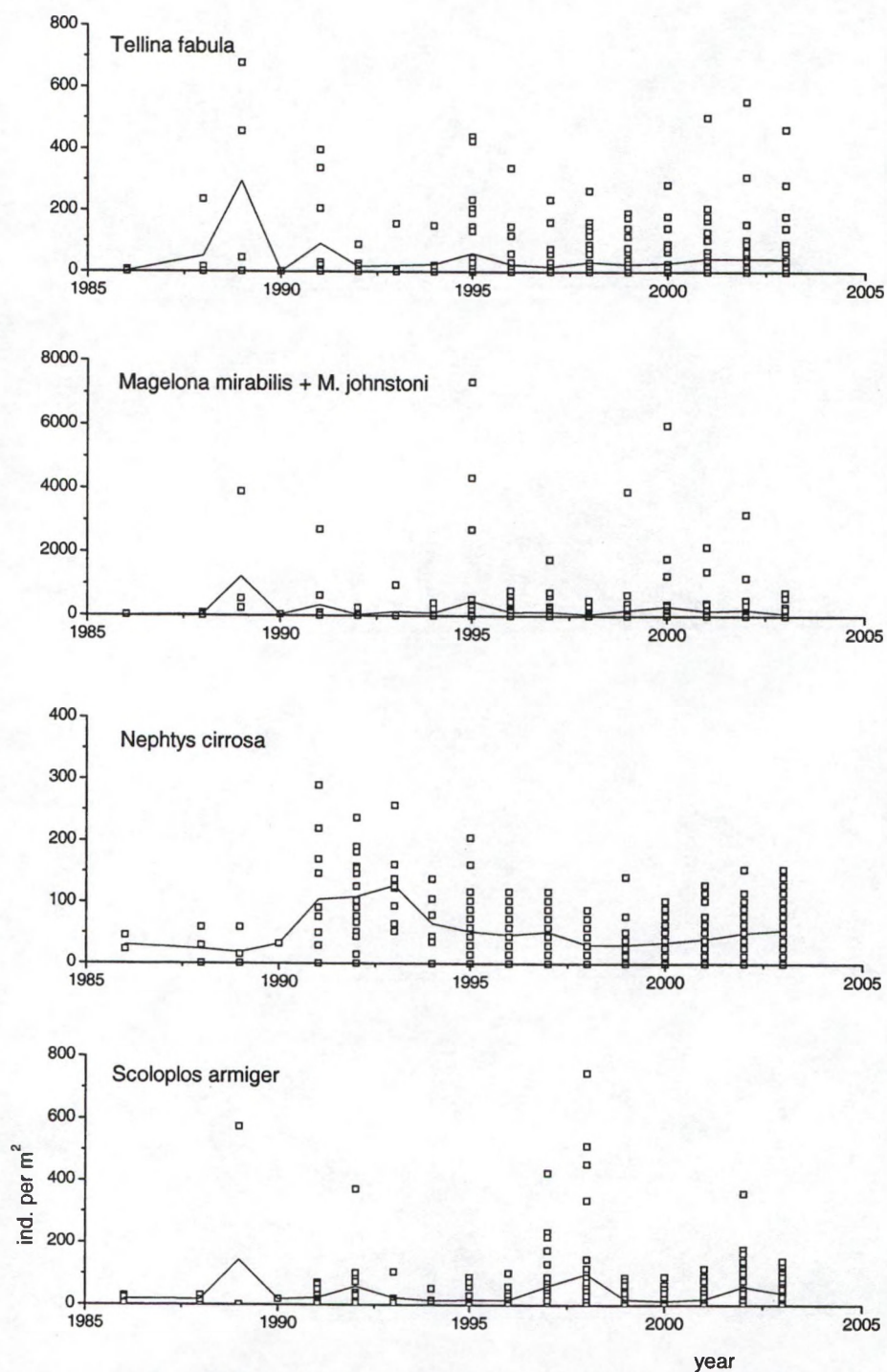


Fig. 15b: Densities of 4 species in the offshore area (1986-2003)

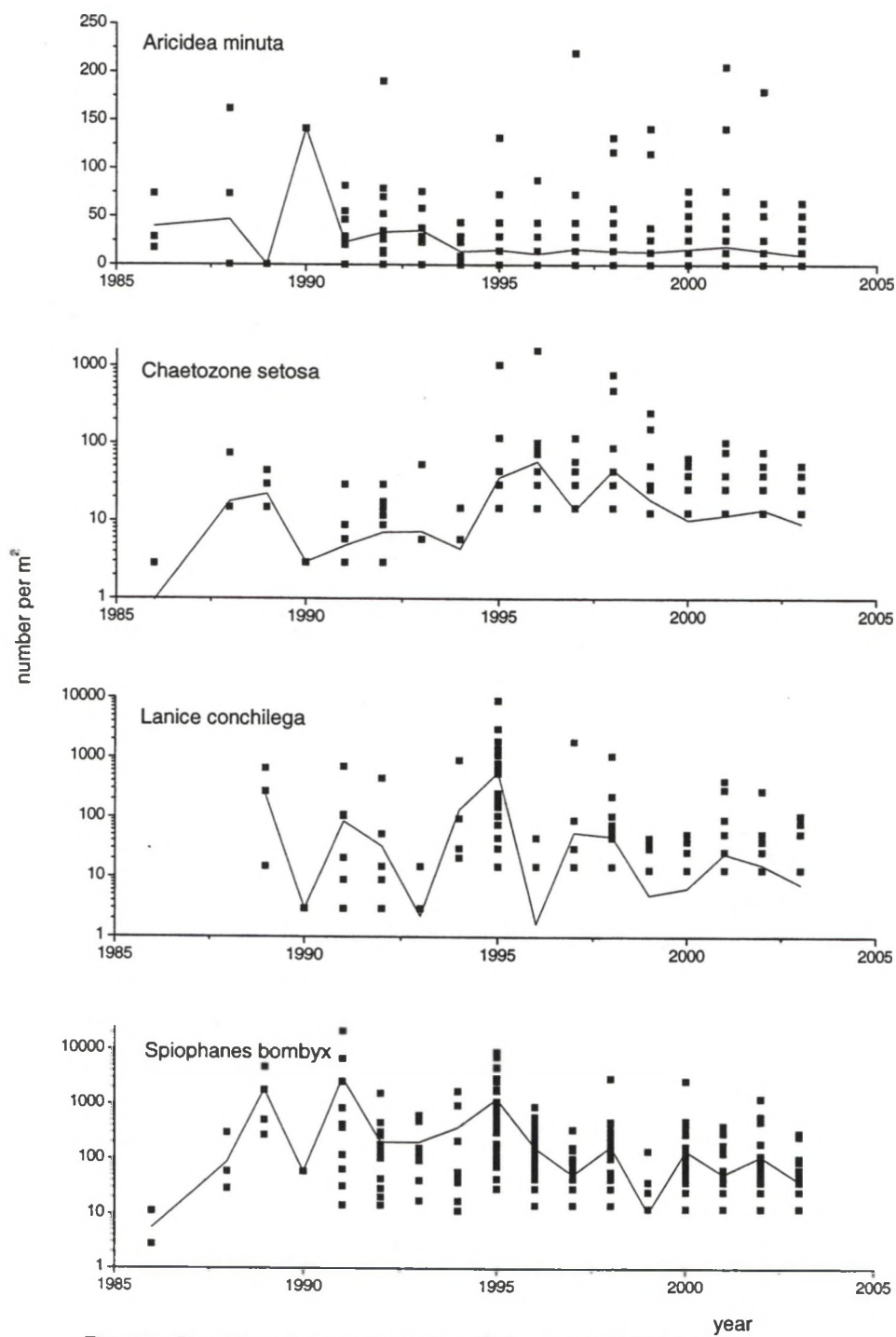


Fig. 15c: Densities of 4 species in the offshore area (1986-2003).

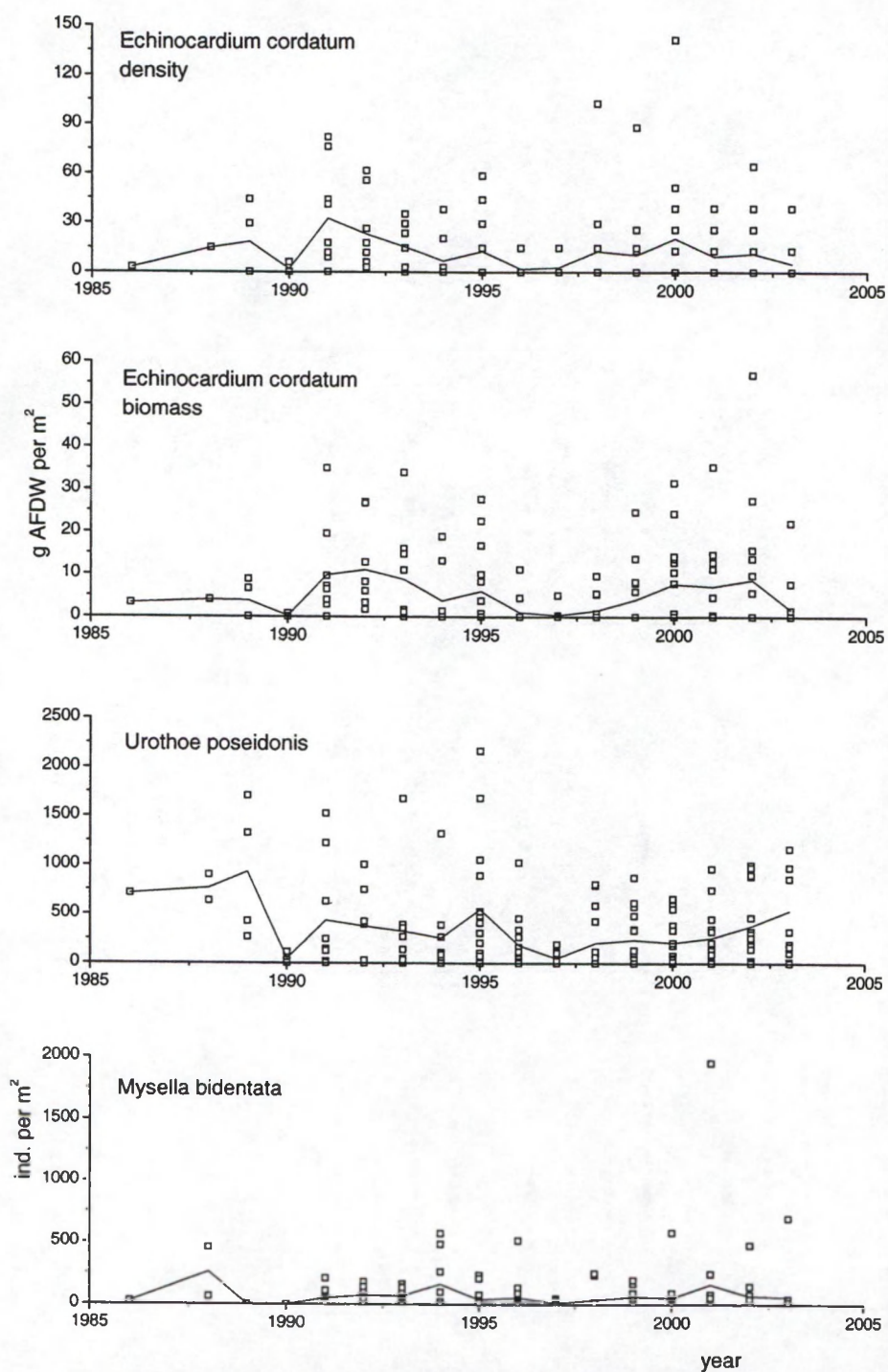


Fig. 16a: Densities (and biomass of *E. cordatum*) of 3 species in the coastal area (1986-2003).

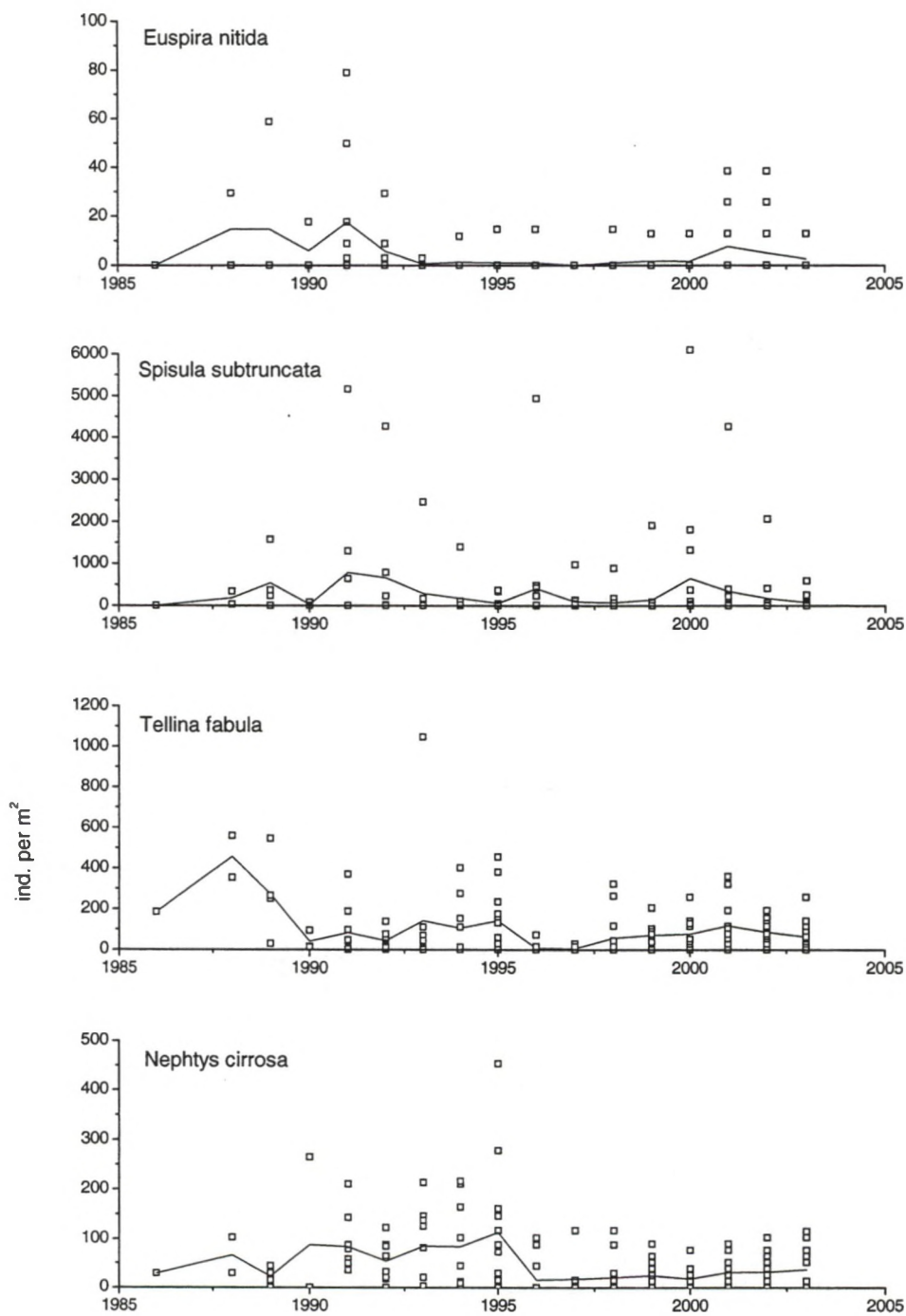


Fig. 16b: Densities of 4 species in the coastal area (1986-2003)

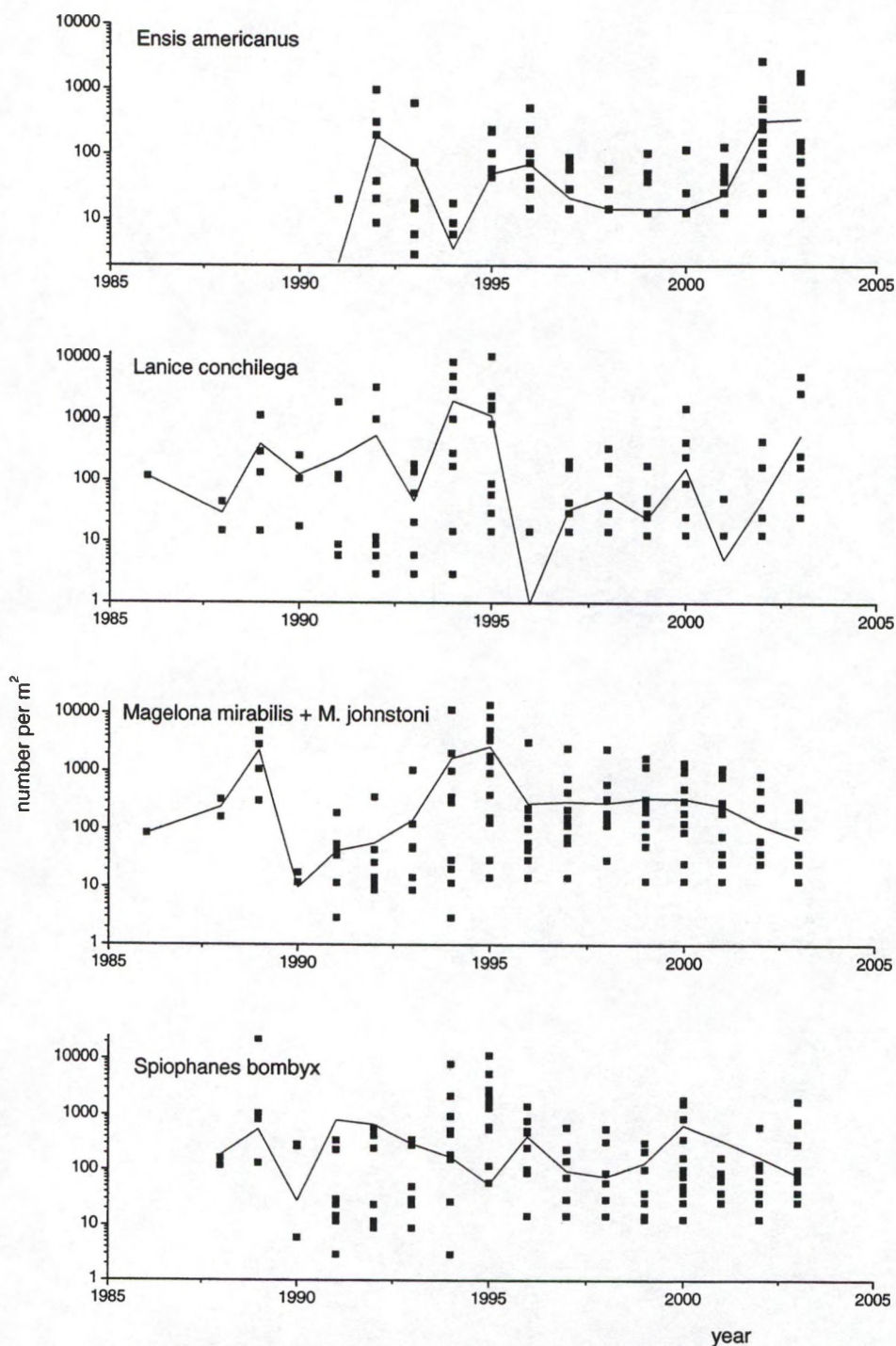


Fig. 16c: Densities of 4 species in the coastal area (1986-2003).

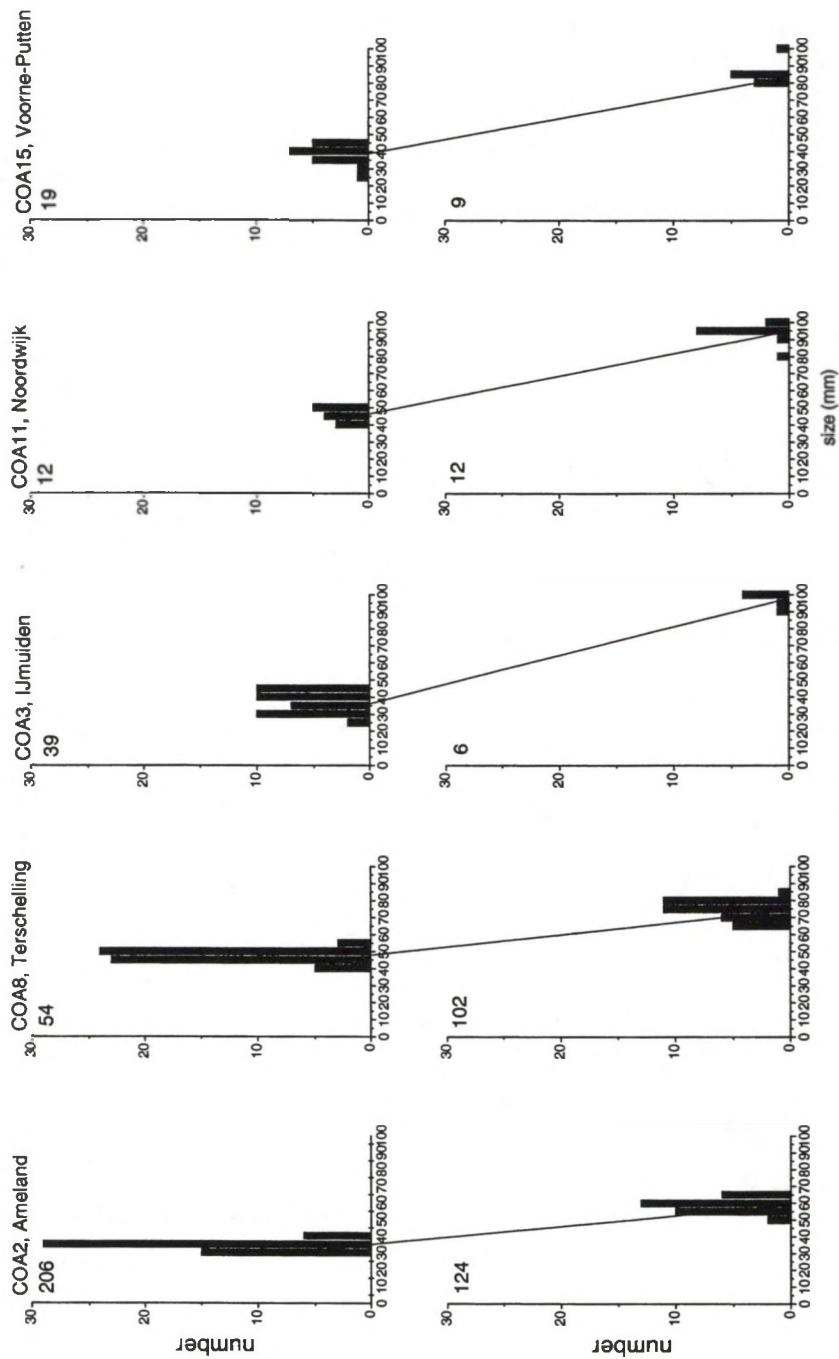


Fig. 17: Size class distribution of *Ensis americanus* at 5 coastal stations in 2002 and 2003

Table 1a. Station number, position, date, depth and sediment composition of the survey 2003.

Station (name)		Geographical position		Date	Depth (m)	Sediment composition		
NIOZ	DONAR	E	N			Med.Gr.	Mud (%)	Mud (%)
code	code					Size (µm)	Fr.<63 µm	Fr.16-63 µm
DOG 1	DOGGBK06	04°03'00"	55°28'18"	16/04/2003	30.0	221	0.2	0.0
DOG 2	DOGGBK02	03°38'30"	55°10'00"	15/04/2003	36.2	194	1.3	0.0
DOG 3	DOGGBK03	03°30'00"	55°15'00"	15/04/2003	28.1	204	0.9	0.0
DOG 4	TERSLG235	03°09'26"	55°10'14"	15/04/2003	30.1	206	0.3	0.0
DOG 5	DOGGBK04	03°14'00"	54°54'42"	15/04/2003	35.7	182	1.3	0.0
DOG 6	DOGGBK05	03°05'00"	54°57'06"	15/04/2003	23.0	222	0.2	0.0
DOG 7	DOGGBK08	03°00'00"	55°00'00"	09/04/2003	25.0	193	0.6	0.0
OYS 1	OESTGDN43	03°25'30"	54°23'00"	09/04/2003	45.5	116	11.1	5.3
OYS 2	FRIESFT16	05°32'30"	54°11'30"	17/04/2003	39.0	199	8.5	1.7
OYS 3	OESTGDN02	04°00'00"	55°00'00"	16/04/2003	47.6	115	8.1	2.7
OYS 4	OESTGDN03	02°56'00"	54°33'00"	09/04/2003	34.0	141	1.8	0.0
OYS 5	FRIESFT02	04°55'00"	54°01'10"	17/04/2003	43.0	127	14.5	2.3
OYS 6	OESTGDN04	04°22'48"	55°18'24"	16/04/2003	46.0	148	3.2	0.0
OYS 7	OESTGDN05	04°18'00"	54°53'00"	16/04/2003	50.3	91	19.2	12.1
OYS 8	FRIESFT03	04°54'00"	53°44'40"	01/04/2003	37.0	191	10.3	2.4
OYS 9	FRIESFT04	03°37'50"	53°45'20"	27/03/2003	37.5	190	2.7	0.0
OYS 10	OESTGDN06	03°42'30"	54°39'00"	15/04/2003	44.3	114	5.7	0.9
OYS 11	FRIESFT05	05°10'00"	53°55'30"	17/04/2003	40.0	132	18.2	6.9
OYS 12	OESTGDN07	04°26'00"	54°10'00"	09/04/2003	49.0	95	15.7	6.5
OYS 13	OESTGDN08	03°30'00"	54°45'00"	15/04/2003	44.5	115	4.9	0.9
OYS 14	OESTGDN09	04°44'30"	54°20'00"	17/04/2003	47.0	135	15.8	3.2
OYS 15	OESTGDN10	04°21'20"	54°28'30"	14/04/2003	50.1	93	19.3	9.0
OYS 16	OESTGDN11	05°03'00"	54°38'30"	16/04/2003	47.0	159	4.6	0.0
OYS 17	OESTGDN12	03°25'08"	54°00'21"	27/03/2003	42.0	192	2.4	0.0
OYS 18	FRIESFT06	05°54'00"	54°11'20"	17/04/2003	37.0	216	3.3	0.0
OYS 19	OESTGDN13	03°19'00"	54°20'00"	09/04/2003	48.2	119	8.5	1.8
OYS 20	OESTGDN14	02°51'51"	54°05'00"	27/03/2003	51.8	208	5.4	0.0
OYS 21	TERSLG50	04°46'03"	53°46'04"	01/04/2003	38.0	118	17.8	5.9
OYS 22	OESTGDN15	03°38'30"	54°18'30"	09/04/2003	43.7	156	4.3	0.9
OYS 23	OESTGDN16	03°22'00"	54°49'24"	15/04/2003	41.5	134	3.3	0.0
OYS 24	BREEVTN34	03°29'46"	53°30'00"	27/03/2003	33.2	134	5.2	0.0
OYS 25	OESTGDN17	04°32'00"	54°39'00"	16/04/2003	49.6	120	10.1	5.4
OYS 26	FRIESFT07	04°47'30"	53°55'20"	17/04/2003	42.0	134	15.8	2.2
OYS 27	OESTGDN18	05°00'00"	54°30'00"	16/04/2003	44.0	172	2.8	0.0
OYS 28	FRIESFT08	03°30'00"	53°45'00"	27/03/2003	36.0	195	2.5	0.0
OYS 29	OESTGDN19	03°00'00"	54°30'00"	09/04/2003	36.2	126	2.4	0.0
OYS 30	BREEVTN02	03°18'21"	53°31'30"	27/03/2003	35.1	128	6.5	0.0
OYS 31	FRIESFT09	04°09'06"	53°50'42"	17/04/2003	44.0	140	6.0	0.0
OYS 32	FRIESFT10	05°05'00"	54°15'30"	17/04/2003	42.0	154	9.6	1.7
OYS 33	OESTGDN20	04°03'00"	54°16'00"	09/04/2003	47.8	107	10.3	3.5
OYS 34	FRIESFT11	04°16'37"	53°37'40"	10/04/2003	37.6	121	9.2	1.6
OYS 35	FRIESFT12	03°52'24"	53°51'31"	27/03/2003	40.0	162	3.8	0.0
OYS 36	FRIESFT17	04°30'00"	53°42'05"	10/04/2003	39.0	110	17.8	5.1
OYS 37	TERSLG100	04°20'27"	54°09'04"	09/04/2003	49.3	99	10.6	5.2
OYS 38	BREEVTN26	03°00'00"	53°30'00"	27/03/2003	32.5	143	5.1	0.0
OYS 39	OESTGDN22	04°00'00"	54°30'00"	15/04/2003	44.7	114	6.9	1.8
OYS 40	OESTGDN21	05°00'00"	55°00'00"	16/04/2003	41.0	157	3.0	0.0
OYS 41	OESTGDN23	03°17'36"	54°51'42"	15/04/2003	39.3	152	2.4	0.0
OYS 42	ROTTMPT70	06°12'51"	54°07'03"	17/04/2003	33.0	233	1.3	0.0

Table 1b. Station number, position, date, depth and sediment composition of the survey 2003.

Station (name)		Geographical position		Date	Depth (m)	Sediment composition		
NIOZ code	DONAR code	E	N			Med.Gr. Size (µm)	Mud (%) Fr.<63 µm	Mud (%) Fr.16-63 µm
OFF 1	FRIESFT13	05°59'00"	53°51'30"	17/04/2003	31.0	210	1.6	0
OFF 2	WADDKT07	06°06'25"	53°37'29"	23/04/2003	23.3	215	1.5	0
OFF 3	WADDKT02	05°49'37"	53°36'40"	23/04/2003	26.2	193	1.8	0
OFF 4	FRIESFT14	04°57'30"	53°40'00"	01/04/2003	31.0	205	3.3	0
OFF 5	FRIESFT15	04°22'30"	53°29'00"	10/04/2003	28.5	219	2.4	0
OFF 6	BREEVTN03	04°26'32"	53°11'16"	10/04/2003	31.0	334	0.7	0
OFF 7	BREEVTN04	04°18'22"	53°05'59"	10/04/2003	36.0	230	1.2	0
OFF 8	BREEVTN05	04°00'30"	53°01'30"	10/04/2003	29.0	238	0.7	0
OFF 9	BREEVTN06	04°13'50"	52°49'20"	28/03/2003	26.0	256	0.7	0
OFF 10	BREEVTN07	03°50'30"	52°45'40"	31/03/2003	30.3	281	0.8	0
OFF 11	BREEVTN08	03°31'18"	53°17'00"	27/03/2003	27.1	200	2.4	0
OFF 12	BREEVTN09	03°23'30"	53°03'55"	10/04/2003	28.0	271	0.9	0
OFF 13	BREEVTN10	03°11'36"	53°02'58"	10/04/2003	29.4	270	0.8	0
OFF 14	BREEVTN11	03°17'20"	52°53'53"	31/03/2003	32.8	277	1.3	0
OFF 15	BREEVTN12	03°17'18"	52°50'12"	31/03/2003	33.3	364	0.5	0
OFF 16	BREEVTN13	03°30'00"	52°45'00"	31/03/2003	26.5	268	0.3	0
OFF 17	BREEVTN14	03°12'12"	52°27'43"	25/03/2003	28.0	294	0.7	0
OFF 18	BREEVTN15	03°11'25"	52°20'25"	25/03/2003	29.0	338	0.4	0
OFF 19	BREEVTN16	03°24'42"	52°15'10"	25/03/2003	28.8	324	0.3	0
OFF 20	BREEVTN17	03°30'00"	52°15'00"	25/03/2003	30.3	376	0.1	0
OFF 21	BREEVTN18	03°00'00"	52°00'00"	24/03/2003	37.0	592	0.1	0
OFF 22	BREEVTN19	03°59'15"	52°16'30"	25/03/2003	23.3	362	0.6	0
OFF 23	BREEVTN20	04°09'50"	52°23'08"	26/03/2003	22.5	319	0.7	0
OFF 24	BREEVTN21	03°42'58"	52°00'00"	24/03/2003	28.0	502	0.2	0
OFF 25	BREEVTN22	03°24'26"	52°06'12"	24/03/2003	31.0	364	0.5	0
OFF 26	BREEVTN23	03°11'34"	51°56'07"	24/03/2003	29.9	462	0.1	0
OFF 27	BREEVTN24	03°14'28"	51°41'40"	25/03/2003	26.7	463	0.2	0
OFF 28	BREEVTN25	02°52'48"	51°52'40"	24/03/2003	34.0	445	0.4	0
OFF 29	ROTTMPT50	06°18'36"	53°57'14"	17/04/2003	31.0	395	0.5	0
OFF 30	TERSLG30	04°56'17"	53°36'56"	01/04/2003	25.0	219	0.9	0
OFF 31	BREEVTN27	03°55'01"	52°59'53"	10/04/2003	26.0	259	0.4	0
OFF 32	NOORDWK30	04°02'53"	52°23'15"	26/03/2003	23.3	340	0.4	0
OFF 33	NOORDWK50	03°47'07"	52°28'30"	26/03/2003	30.0	272	0.7	0
OFF 34	NOORDWK70	03°31'53"	52°34'10"	25/03/2003	31.0	298	0.2	0
OFF 35	WALCRN30	03°06'49"	51°43'06"	24/03/2003	28.4	349	0.4	0
OFF 36	WALCRN70	02°40'45"	51°57'25"	24/03/2003	44.0	430	0.6	0
COA 1	WADDKT03	05°59'53"	53°32'34"	23/04/2003	18.3	234	1	0
COA 2	WADDKT04	05°37'48"	53°30'19"	22/04/2003	8.9	190	0.6	0
COA 3	HOLLSKT03	04°31'50"	52°32'50"	28/03/2003	18.2	229	2.6	0
COA 4	HOLLSKT02	04°40'00"	52°50'00"	18/04/2003	11.3	229	0.9	0
COA 5	WADDKT05	04°41'20"	53°03'23"	18/04/2003	11.4	205	1.3	0
COA 6	WADDKT06	06°11'03"	53°32'09"	23/04/2003	7.7	175	2.7	0
COA 7	ROTTMPT3	06°32'46"	53°34'57"	23/04/2003	7.2	192	0.4	0
COA 8	TERSLG4	05°09'02"	53°24'54"	01/04/2003	12.5	221	1.4	0
COA 9	HOLLSKT04	04°30'00"	52°45'00"	28/03/2003	21.2	229	1.2	0
COA 10	NOORDWK2	04°24'20"	52°15'36"	26/03/2003	13.0	246	1	0
COA 11	NOORDWK10	04°18'01"	52°17'41"	26/03/2003	18.5	321	0.6	0
COA 12	VOORDTA2	03°23'15"	51°37'04"	25/03/2003	11.5	278	0.9	0
COA 13	VOORDTA3	03°36'02"	51°42'23"	09/04/2003	5.1	290	0.5	0
COA 14	VOORDTA4	03°48'48"	51°47'26"	09/04/2004	3.6	236	2.7	0
COA 15	VOORDTA5	03°55'09"	51°55'20"	25/03/2003	14.5	206	1.3	0

Table 2. Mean values of abiotic and biotic parameters in the 4 areas in 2003.

	AREA			
	Dogger Bank	Oyster Ground	Offshore area	Coastal area
No. of stations	7	42	36	15
Median Grain Size (μm)	203	143	318	232
Silt content (fr. < 63 μm , %)	0.7	8.1	0.8	1.3
silt (fr. 16- 63 μm , %)	0.0	2.1	0.0	0.0
Depth (m)	30	42	29	12
Diversity:				
Total number of species	77	160	96	64
Number of species per core	35.1	30.9	16.8	16.7
Shannon- Wiener diversity	2.94	2.42	2.23	1.84
Simpson's dominance	0.08	0.19	0.14	0.25
No. individuals (ind./m²):				
Crustaceans	590	229	247	616
Echinoderms	233	643	35	15
Molluscs	390	615	112	607
Polychaetes	753	463	324	1208
Miscellaneous	305	369	93	25
TOTAL DENSITY	2271	2319	811	2471
Biomass (g AFDW/m²):				
Crustaceans	0.3	7.2	0.6	0.3
Echinoderms	3.5	5.7	5.3	2.2
Molluscs	1.5	2.6	2.5	126.8
Polychaetes	2.9	4.6	2.1	9.7
Miscellaneous	0.2	1.8	0.0	3.2
TOTAL BIOMASS	8.4	21.9	10.5	142.2

Appendix-1 Biomonitoring 2003 (+ = presence)

	Dogger Bank														Oyster Ground															
	Dog	Dog	Dog	Dog	Dog	Dog	Dog	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys				
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18					
Species name																										Code				
<i>Abra alba</i>									+						+			+	+			+			+	ABRAALBA				
<i>Abra nitida</i>														+												ABRANITI				
<i>Abra prismatica</i>		+			+						+															ABRAPRIS				
<i>Acanthocardia echinata</i>																						+				ACANECHI				
<i>Acidostoma obesum</i>	+	+	+																							ACIDOBES				
<i>Acrocrida brachiata</i>		+			+		+				+															ACROBRAC				
<i>Altenaeum dawsoni</i>											+															ALTENDAW				
<i>Ampelisca brevicornis</i>					+					+									+				+			AMPEBREV				
<i>Ampelisca tenuicornis</i>							+		+	+					+						+	+	+			AMPETENU				
<i>Ampharete acutifrons</i>										+																AMPHACUT				
<i>Branchiostoma lanceolatum</i>	+	+	+				+				+															BRANLANC				
<i>Amphipoda indet.</i>																										AMPHINDE				
<i>Amphiura chiajei</i>	+	+	+	+	+	+	+																			AMPHCHIA				
<i>Amphiura filiformis</i>								+	+	+		+	+	+			+	+	+	+	+	+	+	+	+	AMPHFILI				
<i>Anthozoa spec.</i>	+	+	+	+		+				+																ANTHOZOA				
<i>Aonides paucibranchiata</i>															+						+	+				AONIPAUC				
<i>Apelochaeta marioni</i>																						+				APHEMARI				
<i>Aphrodite aculeata</i>																+										APHRACUL				
<i>Aplacophora</i>															+											APLACOPH				
<i>Argissa hamatipes</i>							+				+				+	+										ARGISHAMA				
<i>Aricidea minuta</i>																										ARICMINU				
<i>Asterias rubens</i>																										ASTERUBE				
<i>Asterioidea indet.</i>															+											ASTEINDE				
<i>Astropecten irregularis</i>																								+		ASTRIRRE				
<i>Atylus falcatus</i>																										ATYLFALC				
<i>Atylus swammerdami</i>	+				+																					ATYLSWAM				
<i>Bathyporeia elegans</i>	+	+	+	+	+	+	+	+			+		+				+	+			+		+		+	BATHELEG				
<i>Bathyporeia guilliamsoniana</i>	+	+	+	+		+	+	+					+													BATHGUIL				
<i>Bathyporeia spec. juv.</i>	+	+	+	+			+																			BATHSPEC				
<i>Bivalve indet.</i>											+															BIVAINDE				
<i>Bopyrus squillarum</i>																			+							BOPYSQUI				
<i>Brada villosa</i>															+											BRADVILL				
<i>Brissopsis lyrifera</i>																										BRISLYRI				
<i>Callianassa subterranea</i>									+			+	+		+	+	+	+	+	+	+	+	+	+	+	CALLSUBT				
<i>Callianassa subterranea juv.</i>								+	+	+		+			+	+	+	+	+	+	+	+	+		+	CALLJUVE				
<i>Callianassa tyrrhena</i>																										CALLTYRR				
<i>Callianassa spec. juv.</i>																										CALLSPEC				
<i>Capitella capitata</i>																										CAPICAPI				
<i>Caprellidae spec.</i>															+						+					CAPRELLI				
<i>Carcinus maenas</i>																										CARCMAN				
<i>Cerianthus lloydii</i>												+	+	+												CERILLOY				
<i>Chaetopterus variopedatus</i>										+		+														CHAEVARI				
<i>Chaetozone setosa</i>	+	+	+	+		+		+		+	+			+		+	+			+		+	+	+	+	CHAESETO				
<i>Chamelea striatula</i>	+	+	+	+	+			+		+										+						CHAMSTRI				
<i>Corbula gibba</i>	+								+	+	+	+		+	+	+		+			+	+	+	+	+	CORBGIBB				
<i>Corophium affine</i>										+																COROAFFI				
<i>Corystes cassivelaunus</i>																+										CORYCASS				
<i>Cylichna cylindracea</i>								+		+	+	+	+	+			+			+			+		+	CYLICYLI				
<i>Devonia perrieri</i>																										DEVOPERR				
<i>Diastylis bradyi</i>		+				+				+			+		+		+		+					+		DIASBRAD				
<i>Diplocirrus glaucus</i>								+		+	+	+		+	+	+	+	+		+			+		+	DIPGLAU				

Appendix-1 Biomonitoring 2003 (+ = presence)

	Dogger Bank							Oyster Ground																			
	Dog	Dog	Dog	Dog	Dog	Dog	Dog	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys		
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
Species name	Code																										
<i>Donax vittatus</i>	+																									DONAVITT	
<i>Dosinia lupinus</i>	+		+			+					+		+			+	+							+		DOSILUPI	
<i>Drilonereis filum</i>																										DRILFILU	
<i>Ebalia cranchii</i>			+				+	+																		EBALCRAN	
<i>Ebalia spec. juv.</i>															+											EBALSPEC	
<i>Echinocardium cordatum</i>	+		+		+	+	+			+					+		+			+	+		+	+		ECHICORD	
<i>Echinocyamus pusillus</i>	+		+	+																						ECHIPUSI	
<i>Echiurus echiurus juv.</i>							+																			ECHIECHI	
<i>Edwardsia clapedii</i>				+	+	+				+	+									+	+		+	+		EDWACLAP	
<i>Endeis spinosa</i>																										ENDESPIN	
<i>Ensis americanus</i>																										ENSIAMER	
<i>Ensis ensis</i>					+																					ENSIENSI	
<i>Ensis siliqua</i>																										ENSISILI	
<i>Eteone barbata</i>																										ETEOBARB	
<i>Eteone foliosa</i>																	+									ETEOFOLI	
<i>Eteone longa</i>	+											+														ETEOLONG	
<i>Eudorella truncatula</i>								+	+	+		+	+	+	+	+	+					+	+	+		EUDOTRUN	
<i>Eudorellopsis deformis</i>																+								+		EUDODEFO	
<i>Eumida sanguinea</i>											+									+				+		EUMISANG	
<i>Euspira catena</i>					+																					EUSPCATE	
<i>Euspira nitida</i>	+	+	+	+	+	+	+			+					+	+	+	+	+	+				+		EUSPNITI	
<i>Euzonus flabelligerus</i>																										EUZOFLAB	
<i>Exogone hebes</i>																										EXOGHEBE	
<i>Gari fervensis</i>				+			+				+		+													GARIFERV	
<i>Gattyana cirrosa</i>										+		+														GATTTCIRR	
<i>Glycera alba</i>												+														GLYCALBA	
<i>Glycera lapidum</i>																										GLYCLAPI	
<i>Glycera rouxi</i>																						+				GLYCROUX	
<i>Glycera spec. juv.</i>										+		+							+		+			+		GLYCSPEC	
<i>Golfingia elongata</i>																		+								GOLFELON	
<i>Golfingia vulgaris</i>																		+	+			+				GOLFFVULG	
<i>Goniada maculata</i>	+	+	+	+	+	+	+			+						+	+			+			+	+		GONIMACU	
<i>Goniadella bobretzkii</i>																										GONIBOBR	
<i>Goodallia triangularis</i>																										GOODTRIA	
<i>Gyptis capensis</i>											+	+	+		+		+	+					+			GYPTCAPE	
<i>Harmothoe imbricata</i>																					+	+				HARMIMBR	
<i>Harmothoe impar</i>															+											HARMIMPA	
<i>Harmothoe spec. juv.</i>		+			+						+													+		HARMSPEC	
<i>Harpinia antennaria</i>					+			+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	HARPANTE	
<i>Heteromastus filiformis</i>																										HETEFILI	
<i>Hippomedon denticulatus</i>		+			+		+				+															HIPPIDENT	
<i>Holothuroidea indet.</i>																										HOLOINDE	
<i>Hyala vitrea</i>							+		+	+		+	+	+			+		+		+	+	+			HYALVITR	
<i>Hyperidae</i>													+													HYPERIID	
<i>Ione thoracica</i>								+	+						+			+		+	+	+		+	+	IONETHOR	
<i>Iphinoe trispinosa</i>																										IPHITRIS	
<i>Labidoplax buski</i>															+											LABIBUSK	
<i>Lagisca extenuata</i>																								+		LAGIEXTE	
<i>Lanice conchilega</i>				+									+											+		LANICONC	
<i>Lepton squamosum</i>																		+								LEPTSQUA	
<i>Leptognathia spec.</i>																										LEPTSPEC	

Appendix-1 Biomonitoring 2003 (+ = presence)

	Dogger Bank							Oyster Ground																			
	Dog	Dog	Dog	Dog	Dog	Dog	Dog	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys		
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
Species name																											Code
<i>Leptosynapta inhaerens</i>																		+								LEPTINHA	
<i>Leucothoe incisa</i>											+							+						+		LEUCINCI	
<i>Liocarcinus marmoreus</i>																										LIOCMARM	
<i>Liocarcinus spec. juv.</i>																										LIOCSPEC	
<i>Lucinoma borealis</i>						+						+								+						LUCIBORE	
<i>Lumbrineris fragilis</i>																			+							LUMBRFRAG	
<i>Lumbrineris latreilli</i>																+										LUMBLATR	
<i>Lysilla loveni</i>								+												+						LYSILOVE	
<i>Macoma balthica</i>																				+						MACOBALT	
<i>Mactra corallina</i>																										MACTCORA	
<i>Magelona allenii</i>				+								+	+							+				+		MAGEALLE	
<i>Magelona johnstoni</i>	+	+	+	+	+	+	+				+					+							+	+	+	MAGEJOHN	
<i>Magelona mirabilis</i>	+	+	+	+	+	+	+		+		+	+	+	+		+	+								+	MAGEMIRA	
<i>Malmgreniella lunulata</i>																										MALMLUNU	
<i>Mediomastus fragilis</i>											+					+			+	+						MEDIFRAG	
<i>Megaluropus agilis</i>	+						+	+																		MEGAAGIL	
<i>Metopa rubrovittata</i>																										METORUBR	
<i>Mya truncata</i>																										MYATRUNC	
<i>Myriochele oculata</i>															+	+	+	+	+	+						MYRIOCUL	
<i>Mysella bidentata</i>			+	+		+	+	+	+	+			+			+	+		+	+	+		+	+	+	MYSEBIDE	
<i>Mysia undata</i>						+	+			+					+											MYSIUNDA	
<i>Nebalia bipes</i>																										NEBABIPE	
<i>Nematoda</i>											+														+	NEMATODA	
<i>Nemertini</i>	+			+	+	+	+	+	+	+	+	+	+	+		+	+							+	+	NEMERTIN	
<i>Nephrops norvegicus</i>																				+						NEPHNORV	
<i>Nephtys assimilis</i>			+		+	+																				NEPHASSI	
<i>Nephtys caeca</i>																			+							NEPHCAEC	
<i>Nephtys cirrosa</i>	+		+	+		+	+										+				+					NEPHCIRR	
<i>Nephtys hombergii</i>	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+		+	+	NEPHHOMB	
<i>Nephtys incisa</i>												+						+	+		+	+				NEPHINCI	
<i>Nephtys longosetosa</i>																					+					NEPHLONG	
<i>Nephtys spec. juv.</i>	+	+					+	+	+			+				+		+			+		+			NEPHSPEC	
<i>Nereis longissima</i>	+		+							+		+				+	+	+	+		+				+	NERELONG	
<i>Notomastus latericeus</i>	+			+		+				+	+	+	+	+	+	+	+			+		+				NOTOLATE	
<i>Nucula nitidosa</i>					+			+		+	+					+	+	+	+	+	+	+	+	+	+	NUCUNITI	
<i>Nucula tenuis</i>													+	+												NUCUTENU	
<i>Oligochaeta</i>																+										OLIGOCHA	
<i>Ophelia limacina</i>	+																									OPHELIMA	
<i>Ophelina acuminata</i>																				+						OPHEACUM	
<i>Ophiodromus flexuosus</i>								+	+	+					+	+	+	+	+	+	+	+	+	+	+	OPHIFLEX	
<i>Ophiura albida</i>																+										OPHIALBI	
<i>Ophiura texturata</i>																										OPHITEXT	
<i>Ophiura spec. juv.</i>				+					+															+	+	OPHISPEC	
<i>Orbinia sertulata</i>																					+					ORBISERT	
<i>Orchomene nana</i>					+																			+		ORCHNANA	
<i>Orchomene spec. juv.</i>																										ORCHSPEC	
<i>Owenia fusiformis</i>			+			+	+						+		+					+			+	+		OWENFUSI	
<i>Pagurus bernhardus</i>																										PAGUBERN	
<i>Paraonis fulgens</i>															+						+	+				PARAFULG	
<i>Pectinaria auricoma</i>								+		+			+									+		+		PECTAURI	
<i>Pectinaria koreni</i>							+					+		+			+	+				+				PECTKORE	

Appendix-1 Biomonitoring 2003 (+ = presence)

	Dogger Bank							Oyster Ground																		
	Dog	Dog	Dog	Dog	Dog	Dog	Dog	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Species name																										Code
<i>Pelonaia corrugata</i>										+																PELOCORR
<i>Periculodes longimanus</i>	+	+		+			+													+			+		+	PERILONG
<i>Phaxas pellucidus</i>		+											+							+					+	PHAXPELL
<i>Pherusa plumosa</i>														+												PHERPLUM
<i>Pholoe minuta</i>			+		+			+	+	+	+		+	+	+		+	+		+			+		+	PHOLMINU
<i>Phoronida</i>	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PHORONID
<i>Photis longicaudata</i>												+														PHOTLONG
<i>Phthisica marina</i>																										PHTHMARI
<i>Phyllodoce groenlandica</i>																										PHYLGROE
<i>Phyllodoce laminosa</i>																										PHYLLAMI
<i>Phyllodoce rosea</i>																									+	PHYLROSE
<i>Phyllodocidae indet.</i>					+																					PHYLINDE
<i>Podarkeopsis helgolandica</i>									+																	PODAHELG
<i>Poecilochaetus serpens</i>									+		+				+	+			+							POECSERP
<i>Polychaeta indet.</i>																										POLYINDE
<i>Polydora ciliata</i>										+					+				+				+			POLYCILI
<i>Polydora spec. juv.</i>										+								+								POLYSPEC
<i>Polynoe kinbergi</i>								+										+								POLYKINB
<i>Polyphysia crassa</i>															+											POLYCRAS
<i>Pontocrates altamarinus</i>	+																									PONTALTA
<i>Pontophilus bispinosus</i>	+																									PONTBISP
<i>Pontophilus trispinosus</i>						+																				PONTTRIS
<i>Prionospio cirrifera</i>																		+								PRIOCIRR
<i>Processa noveli holthuisi</i>																										PROCNOHO
<i>Processa parva</i>																										PROCPARV
<i>Pseudocuma longicornis</i>		+		+	+		+																	+		PSEULONG
<i>Rhodine loveni</i>							+								+											RHODLOVE
<i>Saxicavella jeffreysi</i>										+																SAXIJEFF
<i>Scalibregma inflatum</i>																										SCALINFL
<i>Scolelepis bonnier</i>			+	+	+	+																				SCOLBONN
<i>Scolelepis foliosa</i>																										SCOLFOLI
<i>Scolelepis squamata</i>																										SCOLSQUA
<i>Scoloplos armiger</i>				+	+			+			+		+		+		+		+				+			SCOLARMI
<i>Scopelochirus hopi</i>																										SCOPHOPI
<i>Sigalion mathildae</i>		+	+	+	+	+	+	+			+					+							+			SIGAMATH
<i>Siphonocetus kroyeranus</i>		+		+	+	+	+																			SIPHKROY
<i>Spio filicornis</i>		+						+	+		+		+					+	+	+	+		+	+		SPIOFILI
<i>Spiophanes bombyx</i>	+	+	+	+	+	+	+		+		+	+	+		+		+	+		+	+		+	+		SPIOBOMB
<i>Spiophanes kroeyeri</i>										+					+											SPIOKROE
<i>Spisula solida</i>																										SPISSOLI
<i>Spisula subtruncata</i>		+										+														SPISSUBT
<i>Sthenelais boa</i>																										STHENBOA
<i>Sthenelais limicola</i>	+	+			+			+		+	+						+		+			+	+			STHELIMI
<i>Streptosyllis websteri</i>																										STREWEBS
<i>Syllidae spec.</i>																										SYLLIDAE
<i>Synchelidium maculatum</i>				+			+																			SYNCMACU
<i>Synelmis klatti</i>								+		+				+		+	+		+	+	+		+			SYNEKLAT
<i>Tellimya ferruginosa</i>									+							+							+		+	TELLFERR
<i>Tellimya tenella</i>																										TELLTENE
<i>Tellina fabula</i>	+	+	+	+	+	+	+				+													+		TELLFABU
<i>Tellina pygmea</i>																										TELLPYGM

Appendix-1 Biomonitoring 2003 (+ = presence)

	Dogger Bank													Oyster Ground																	
	Dog	Dog	Dog	Dog	Dog	Dog	Dog	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys					
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Species name																										Code					
<i>Tellina tenuis</i>																										TELLTENU					
<i>Terebellides stroemi</i>															+											TERESTRO					
<i>Thia scutellata</i>																										THIASCUT					
<i>Thracia phaseolina</i>	+	+	+		+		+								+									+	+	THRAPHAS					
<i>Thyasira flexuosa</i>					+			+			+		+							+						THYAFLEX					
<i>Travisia forbesii</i>																										TRAVFORB					
<i>Tridonta montagui</i>	+																									TRIDMONT					
<i>Turbellaria spec.</i>										+				+			+		+	+	+					TURBELLA					
<i>Turritella communis</i>																							+			TURRCOMM					
<i>Upogebia deltaura</i>																		+	+		+					UPOGDELT					
<i>Upogebia deltaura juv.</i>																		+								UPOGJUVE					
<i>Upogebia stellata</i>																						+				UPOGSTEL					
<i>Urothoe brevicornis</i>	+	+	+	+			+																	+		UROTBREV					
<i>Urothoe poseidonis</i>	+	+	+	+	+	+	+								+									+	+	UROTPOSE					
<i>Venerupis senegalensis</i>																										VENESENE					
<i>Westwoodilla caecula</i>														+	+							+				WESTCAEC					

Appendix-1 Biomonitoring 2003 (+ = presence)

	Oyster Ground																								
	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
Species name																									Code
<i>Abra alba</i>		+	+		+	+	+		+		+					+		+		+					ABRAALBA
<i>Abra nitida</i>	+																								ABRANITI
<i>Abra prismatica</i>						+																			ABRAPRIS
<i>Acanthocardia echinata</i>																									ACANECHI
<i>Acidostoma obesum</i>																									ACIDOBES
<i>Acrocnida brachiata</i>																							+		ACROBRAC
<i>Altenaeum dawsoni</i>																			+						ALTENDAW
<i>Ampelisca brevicornis</i>							+							+											AMPEBREV
<i>Ampelisca tenuicornis</i>	+	+	+	+	+		+	+					+					+			+				AMPETENU
<i>Ampharete acutifrons</i>																									AMPHACUT
<i>Branchiostoma lanceolatum</i>									+																BRANLANC
<i>Amphipoda indet.</i>																						+			AMPHINDE
<i>Amphiura chiajei</i>																									AMPHCHIA
<i>Amphiura filiformis</i>	+	+	+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	AMPHFILI
<i>Anthozoa spec.</i>																									ANTHOZOA
<i>Aonides paucibranchiata</i>			+																						AONIPAUC
<i>Aphelocheata marioni</i>																									APHEMARI
<i>Aphrodite aculeata</i>													+												APHRACUL
<i>Aplacophora</i>																					+				APLACOPH
<i>Argissa hamatipes</i>																									ARGISHAMA
<i>Aricidea minuta</i>																									ARICMINU
<i>Asterias rubens</i>																									ASTERUBE
<i>Asteroidea indet.</i>	+			+													+						+		ASTEINDE
<i>Astropecten irregularis</i>									+																ASTRIIRRE
<i>Atylus falcatus</i>																									ATYLFALC
<i>Atylus swammerdami</i>																									ATYLSWAM
<i>Bathyporeia elegans</i>					+					+	+										+	+	+	+	BATHELEG
<i>Bathyporeia guilliamsoniana</i>																	+				+	+	+		BATHGUIL
<i>Bathyporeia spec. juv.</i>																									BATHSPEC
<i>Bivalve indet.</i>																									BIVAINDE
<i>Bopyrus squillarum</i>																									BOPYSQUI
<i>Brada villosa</i>																									BRADVILL
<i>Brissopsis lyrifera</i>	+	+																							BRISLYRI
<i>Callianassa subterranea</i>	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	CALLSUBT
<i>Callianassa subterranea juv.</i>		+	+	+		+	+	+			+	+	+	+	+	+	+	+	+	+	+			+	CALLJUVE
<i>Callianassa tyrrenna</i>																									CALLTYRR
<i>Callianassa spec. juv.</i>																									CALLSPEC
<i>Capitella capitata</i>																									CAPICAPI
<i>Caprellidae spec.</i>																						+			CAPRELLI
<i>Carcinus maenas</i>																									CARCMAN
<i>Cerianthus lloydii</i>											+														CERILLOY
<i>Chaetopterus variopeatus</i>				+				+	+								+				+				CHAEVARI
<i>Chaetozone setosa</i>	+			+	+		+							+					+		+	+	+	+	CHAESETO
<i>Chamelea striatula</i>		+						+														+	+		CHAMSTRI
<i>Corbula gibba</i>			+	+			+	+	+	+		+	+	+	+	+		+	+			+	+	+	CORBGIBB
<i>Corophium affine</i>																									COROAFI
<i>Corystes cassivelaunus</i>																									CORYCASS
<i>Cylichna cylindracea</i>	+	+	+	+	+		+		+		+		+	+			+		+		+	+	+	+	CYLICYLI
<i>Devonia perrieri</i>			+																						DEVOPERR
<i>Diastylis bradyi</i>						+	+		+			+	+	+	+	+		+				+	+		DIASBRAD
<i>Diplocirrus glaucus</i>	+	+		+	+					+	+		+		+		+	+	+		+		+		DIPLGLAU

Appendix-1 Biomonitoring 2003 (+ = presence)

	Oyster Ground																								
	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
Species name																									Code
<i>Donax vittatus</i>																									DONAVITT
<i>Dosinia lupinus</i>																							+		DOSILUPI
<i>Drilonereis filum</i>		+																							DRILFILU
<i>Ebalia cranchii</i>																									EBALCRAN
<i>Ebalia spec. juv.</i>																									EBALSPEC
<i>Echinocardium cordatum</i>		+					+		+			+			+	+	+	+		+					+ ECHICORD
<i>Echinocyamus pusillus</i>																								+	ECHIPUSI
<i>Echiurus echiurus juv.</i>											+														ECHIECHI
<i>Edwardsia clapedii</i>					+						+										+				EDWACLAP
<i>Endeis spinosa</i>																									ENDESPIN
<i>Ensis americanus</i>																									ENSIAMER
<i>Ensis ensis</i>																									ENSIENSI
<i>Ensis siliqua</i>										+															ENSISILU
<i>Eteone barbata</i>																									ETEOBARB
<i>Eteone foliosa</i>																									ETEOFOLI
<i>Eteone longa</i>																							+		ETEOLONG
<i>Eudorella truncatula</i>	+	+		+	+				+	+		+	+			+		+					+	+	EUDOTRUN
<i>Eudorellopsis deformis</i>											+														EUDODEFO
<i>Eumida sanguinea</i>																					+				EUMISANG
<i>Euspira catena</i>																									EUSPCATE
<i>Euspira nitida</i>			+		+	+			+		+		+	+		+		+		+				+	EUSPNITI
<i>Euzonus flabelligerus</i>																									EUZOFLAB
<i>Exogone hebes</i>																									EXOGHEBE
<i>Gari fervensis</i>		+																							GARIFERV
<i>Gattyana cirrosa</i>								+	+								+								GATTTCIRR
<i>Glycera alba</i>	+						+						+	+											GLYCALBA
<i>Glycera lapidum</i>																									GLYCLAPI
<i>Glycera rouxi</i>																									GLYCROUX
<i>Glycera spec. juv.</i>		+						+									+	+	+						GLYCSPEC
<i>Golfingia elongata</i>								+																	GOLFELON
<i>Golfingia vulgaris</i>								+	+						+				+						GOLFVULG
<i>Goniada maculata</i>				+	+	+	+	+	+	+	+	+	+					+					+	+	GONIMACU
<i>Goniadella bobretzkii</i>																							+		GONIBOBR
<i>Goodallia triangularis</i>																						+	+		GOODTRIA
<i>Gyptis capensis</i>			+			+			+	+	+	+	+	+		+	+								GYPTCAPE
<i>Harmothoe imbricata</i>																									HARMIMBR
<i>Harmothoe impar</i>																									HARMIMPA
<i>Harmothoe spec. juv.</i>											+														HARMSPEC
<i>Harpinia antennaria</i>		+		+	+	+	+		+	+	+		+	+	+	+	+	+	+		+	+	+		HARPANTE
<i>Heteromastus filiformis</i>																									HETEFILI
<i>Hippomedon denticulatus</i>											+									+					HIPPIDENT
<i>Holothuroidea indet.</i>																									HOLOINDE
<i>Hyala vitrea</i>	+		+				+	+						+					+	+					HYALVITR
<i>Hyperidae</i>																									HYPERIID
<i>Ione thoracica</i>			+	+			+					+	+			+	+	+	+						IONETHOR
<i>Iphinoe trispinosa</i>																									IPHITRIS
<i>Labidoplax buski</i>																									LABIBUSK
<i>Lagisca extenuata</i>																									LAGIEXTE
<i>Lanice conchilega</i>																						+	+		LANICONC
<i>Lepton squamosum</i>			+					+									+	+							LEPTSQUA
<i>Leptognathia spec.</i>				+																					LEPTSPEC

Appendix-1 Biomonitoring 2003 (+ = presence)

	Oyster Ground																								
	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
Species name																									Code
<i>Leptosynapta inhaerens</i>			+																						LEPTINHA
<i>Leucothoe incisa</i>								+		+		+	+					+		+					LEUCINCI
<i>Liocarcinus marmoreus</i>																									LIOCMARM
<i>Liocarcinus spec. juv.</i>																									LIOSPEC
<i>Lucinoma borealis</i>																									LUCIBORE
<i>Lumbrineris fragilis</i>																									LUMBFRAG
<i>Lumbrineris latreilli</i>		+	+			+	+	+				+	+	+		+		+							LUMBLATR
<i>Lysilla loveni</i>				+																					LYSILOVE
<i>Macoma balthica</i>																									MACOBALT
<i>Mactra corallina</i>			+																						MACTCORA
<i>Magelona alleni</i>	+				+							+	+				+				+	+		+	MAGEALLE
<i>Magelona johnstoni</i>									+	+	+									+		+	+	+	MAGEJOHN
<i>Magelona mirabilis</i>		+		+	+				+		+	+	+				+					+	+	+	MAGEMIRA
<i>Malmgreniella lunulata</i>			+			+																			MALMLUNU
<i>Mediomastus fragilis</i>			+			+						+	+			+					+				MEDIFRAG
<i>Megaluropus agilis</i>																									MEGAAGIL
<i>Metopa rubrovittata</i>																									METORUBR
<i>Mya truncata</i>																	+							+	MYATRUNC
<i>Myriochele oculata</i>			+					+										+		+					MYRIOCUL
<i>Mysella bidentata</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	MYSEBIDE
<i>Mysia undata</i>	+			+											+								+		MYSIUNDA
<i>Nebalia bipes</i>														+	+				+						NEBABIBE
<i>Nematoda</i>																									NEMATODA
<i>Nemertini</i>		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NEMERTIN
<i>Nephrops norvegicus</i>																									NEPHNORV
<i>Nephtys assimilis</i>					+																				NEPHASSI
<i>Nephtys caeca</i>											+													+	NEPHCAEC
<i>Nephtys cirrosa</i>																		+						+	NEPHCIRR
<i>Nephtys hombergii</i>			+	+	+	+					+	+	+		+		+				+	+	+		NEPHHOMB
<i>Nephtys incisa</i>							+							+											NEPHINCI
<i>Nephtys longosetosa</i>																									NEPHLONG
<i>Nephtys spec. juv.</i>		+				+		+					+		+				+		+				NEPHSPEC
<i>Nereis longissima</i>			+				+					+		+	+			+						+	NERELONG
<i>Notomastus latericeus</i>		+	+			+	+				+					+	+								NOTOLATE
<i>Nucula nitidosa</i>	+		+	+	+	+			+	+		+	+			+	+	+	+	+	+	+	+	+	NUCUNITI
<i>Nucula tenuis</i>																									NUCUTENU
<i>Oligochaeta</i>																	+		+		+				OLIGOCHA
<i>Ophelia limacina</i>		+										+													OPHELIMA
<i>Ophelina acuminata</i>													+												OPHEACUM
<i>Ophiiodromus flexuosus</i>		+		+	+				+	+		+	+	+		+	+	+					+		OPHIFLEX
<i>Ophiura albida</i>			+				+					+						+						+	OPHIALBI
<i>Ophiura texturata</i>																									OPHITEXT
<i>Ophiura spec. juv.</i>			+			+					+					+	+					+	+	+	OPHISPEC
<i>Orbinia sertulata</i>																					+				ORBISERT
<i>Orchomene nana</i>							+										+	+	+						ORCHNANA
<i>Orchomene spec. juv.</i>																									ORCHSPEC
<i>Owenia fusiformis</i>				+	+						+				+	+						+		+	OWENFUSI
<i>Pagurus bernhardus</i>																									PAGUBERN
<i>Paraonis fulgens</i>													+		+				+						PARAFULG
<i>Pectinaria auricoma</i>				+										+	+							+	+		PECTAURI
<i>Pectinaria koreni</i>							+	+					+		+				+						PECTKORE

Appendix-1 Biomonitoring 2003 (+ = presence)

	Oyster Ground																								
	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	Oys	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
Species name																									Code
<i>Pelonaia corrugata</i>																									PELOCORR
<i>Periculodes longimanus</i>		+			+					+												+		+	PERILONG
<i>Phaxas pellucidus</i>				+									+	+				+	+			+	+		PHAXPELL
<i>Pherusa plumosa</i>																									PHERPLUM
<i>Pholoe minuta</i>	+			+	+		+	+	+		+	+	+	+			+				+	+		+	PHOLMINU
<i>Phoronida</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PHORONID
<i>Photis longicaudata</i>																									PHOTLONG
<i>Phthisica marina</i>																								+	PHTHMARI
<i>Phylodoce groenlandica</i>																									PHYLGROE
<i>Phylodoce laminosa</i>																									PHYLLAMI
<i>Phylodoce rosea</i>																									PHYLOSE
<i>Phylodocidae indet.</i>					+																		+		PHYLINDE
<i>Podarkeopsis helgolandica</i>																									PODAHELG
<i>Poecilochaetus serpens</i>																+		+							POECSERP
<i>Polychaeta indet.</i>																									POLYINDE
<i>Polydora ciliata</i>	+							+					+	+											POLYCILI
<i>Polydora spec. juv.</i>																									POLYSPEC
<i>Polynoe kinbergi</i>				+																					POLYKINB
<i>Polyphysia crassa</i>																									POLYCRAS
<i>Pontocrates altamarinus</i>																									PONTALTA
<i>Pontophilus bispinosus</i>																									PONTBISP
<i>Pontophilus trispinosus</i>																									PONTTRIS
<i>Prionospio cirrifera</i>																									PRIOCIRR
<i>Processa novaei holthuisi</i>							+				+														PROCNOHO
<i>Processa parva</i>																									PROCPARV
<i>Pseudocuma longicomis</i>				+																+					PSEULONG
<i>Rhodine loveni</i>																					+				RHODLOVE
<i>Saxicavella jeffreysi</i>																									SAXIJEFF
<i>Scalibregma inflatum</i>					+							+								+					SCALINFL
<i>Scolecopsis bonnieri</i>																							+	+	SCOLBONN
<i>Scolecopsis foliosa</i>																									SCOLFOLI
<i>Scolecopsis squamata</i>																									SCOLSQUA
<i>Scoloplos armiger</i>	+			+	+					+											+	+	+	+	SCOLARMI
<i>Scopelocheirus hopi</i>															+										SCOPHOPI
<i>Sigalion mathildae</i>									+	+	+									+			+		SIGAMATH
<i>Siphonoecetus kroyeranus</i>																								+	SIPHKROY
<i>Spio filicomis</i>	+				+	+	+	+		+		+	+	+		+	+	+					+		SPIOFILI
<i>Spiophanes bombyx</i>	+		+	+	+	+				+	+	+				+			+		+	+	+	+	SPIOBOMB
<i>Spiophanes kroeyeri</i>																									SPIOKROE
<i>Spisula solida</i>												+													SPISSOLI
<i>Spisula subtruncata</i>					+	+																			SPISSUBT
<i>Sthenelais boa</i>																									STHENBOA
<i>Sthenelais limicola</i>	+			+	+	+				+	+			+			+	+	+		+	+			STHELIMI
<i>Streptosyllis websteri</i>																									STREWEBS
<i>Syllidae spec.</i>																									SYLLIDAE
<i>Synchelidium maculatum</i>																									SYNCMACU
<i>Synelmis klatti</i>		+		+					+	+	+		+		+		+			+	+				SYNEKLAT
<i>Tellinella ferruginosa</i>	+				+	+		+				+			+		+	+	+				+	+	TELLFERR
<i>Tellinella tenella</i>		+																							TELLTENE
<i>Tellina fabula</i>					+					+													+	+	TELLFABU
<i>Tellina pygmaea</i>																									TELLPYGM

Appendix-1 Biomonitoring 2003 (+ = presence)

	Oyster Ground																								
	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	O/S	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
Species name																									Code
<i>Tellina tenuis</i>																									TELTENU
<i>Terebellides stroemi</i>																									TERESTRO
<i>Thia scutellata</i>																									THIASCUT
<i>Thracia phaseolina</i>					+																			+	THRAPHAS
<i>Thyasira flexuosa</i>				+	+						+										+	+	+		THYAFLEX
<i>Travisia forbesii</i>																									TRAVFORB
<i>Tridonta montagui</i>																									TRIDMONT
<i>Turbellaria spec.</i>									+			+					+			+	+				TURBELLA
<i>Turnitella communis</i>													+												TURRCOMM
<i>Upogebia deltaura</i>			+					+					+												UPOGDELT
<i>Upogebia deltaura juv.</i>			+				+	+					+												UPOGJUVE
<i>Upogebia stellata</i>								+							+				+						UPOGSTEL
<i>Urothoe brevicornis</i>													+											+	UROTBREV
<i>Urothoe poseidonis</i>			+										+											+	UROTPOSE
<i>Venerupis senegalensis</i>																									VENESENE
<i>Westwoodilla caecula</i>																									WESTCAEC

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area																										
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Species name																											Code
<i>Abra alba</i>																											ABRAALBA
<i>Abra nitida</i>																											ABRANITI
<i>Abra prismatica</i>																											ABRAPRIS
<i>Acanthocardia echinata</i>																											ACANECHI
<i>Acidostoma obesum</i>					+																						ACIDOBES
<i>Acrocnida brachiata</i>	+																										ACROBRAC
<i>Altenaeum dawsoni</i>																											ALTENDAW
<i>Ampelisca brevicornis</i>																											AMPEBREV
<i>Ampelisca tenuicornis</i>																											AMPETENU
<i>Ampharete acutifrons</i>																											AMPHACUT
<i>Branchiostoma lanceolatum</i>															+												BRANLANC
<i>Amphipoda indet.</i>																											AMPHINDE
<i>Amphiura chiajei</i>																											AMPHCHIA
<i>Amphiura filiformis</i>																											AMPHFILI
<i>Anthozoa spec.</i>					+				+																		ANTHOZOA
<i>Aonides paucibranchiata</i>																+			+								AONIPAUC
<i>Aphelochaeta marioni</i>																											APHEMARI
<i>Aphrodite aculeata</i>																											APHRACUL
<i>Aplacophora</i>																											APLACOPH
<i>Argissa hamatipes</i>																											ARGISHAMA
<i>Aricidea minuta</i>									+	+		+	+		+	+		+			+						ARICMINU
<i>Asterias rubens</i>																											ASTERUBE
<i>Asteroidea indet.</i>																											ASTEINDE
<i>Astropecten irregularis</i>																											ASTIRRE
<i>Atylus falcatus</i>																			+								ATYLFALC
<i>Atylus swammerdami</i>																											ATYLSWAM
<i>Bathyporeia elegans</i>	+	+	+	+	+	+		+	+	+	+	+	+		+	+					+	+					BATHELEG
<i>Bathyporeia guilliamsoniana</i>		+	+	+				+	+	+	+	+	+	+	+	+											BATHGUIL
<i>Bathyporeia spec. juv.</i>									+																		BATHSPEC
<i>Bivalve indet.</i>																											BIVAINDE
<i>Bopyrus squillarum</i>																											BOPYSQUI
<i>Brada villosa</i>																											BRADVILL
<i>Brissopsis lyrifera</i>																											BRISLYRI
<i>Callianassa subterranea</i>					+																						CALLSUBT
<i>Callianassa subterranea juv.</i>					+																						CALLJUVE
<i>Callianassa tyrrhena</i>	+																						+				CALLTYRR
<i>Callianassa spec. juv.</i>				+																							CALLSPEC
<i>Capitella capitata</i>				+																							CAPICAPI
<i>Caprellidae spec.</i>																											CAPRELLI
<i>Carcinus maenas</i>																											CARCMANEN
<i>Cerianthus lloydii</i>																											CERILLOY
<i>Chaetopterus variopedatus</i>																											CHAEVARI
<i>Chaetozone setosa</i>		+	+		+		+		+	+				+		+	+										CHAESETO
<i>Chamelea striatula</i>																											CHAMSTRI
<i>Corbula gibba</i>					+																						CORBGIBB
<i>Corophium affine</i>																											COROAFI
<i>Corystes cassivelaunus</i>																											CORYCASS
<i>Cylichna cylindracea</i>																											CYLICYLI
<i>Devonia perrieri</i>																											DEVOPERR
<i>Diastylis bradyi</i>					+				+	+			+														DIASBRAD
<i>Diplocirrus glaucus</i>																											DIPLGLAU

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area																									
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Species name																										
Code																										
<i>Donax vittatus</i>								+	+	+	+	+	+	+	+											DONAVITT
<i>Dosinia lupinus</i>						+																				DOSILUPI
<i>Drilonereis filum</i>																										DRILFILU
<i>Ebalia cranchii</i>				+																						EBALCRAN
<i>Ebalia spec.juv.</i>																										EBALSPEC
<i>Echinocardium cordatum</i>		+	+	+	+		+	+		+		+						+			+			+		ECHICORD
<i>Echinocyamus pusillus</i>					+	+					+			+												ECHIPUSI
<i>Echiurus echiurus juv.</i>																										ECHIECHI
<i>Edwardsia clapedii</i>																										EDWACLAP
<i>Endeis spinosa</i>											+															ENDESPIN
<i>Ensis americanus</i>						+															+	+				ENSIAMER
<i>Ensis ensis</i>																										ENSIENSI
<i>Ensis siliqua</i>																										ENSISILI
<i>Eteone barbata</i>																										ETEOBARB
<i>Eteone foliosa</i>													+													ETEOFOLI
<i>Eteone longa</i>		+									+									+		+	+			ETEOLONG
<i>Eudorella truncatula</i>																										EUDOTRUN
<i>Eudorellopsis deformis</i>																										EUDODEFO
<i>Eumida sanguinea</i>		+	+																					+		EUMISANG
<i>Euspira catena</i>																										EUSPCATE
<i>Euspira nitida</i>	+			+	+	+	+	+	+	+	+	+	+	+	+					+	+	+	+			EUSPNITI
<i>Euzonus flabelligerus</i>																									+	EUZOFLAB
<i>Exogone hebes</i>										+															+	EXOGHEBE
<i>Gari fervensis</i>																										GARIFERV
<i>Gattyana cirrosa</i>																										GATT CIRR
<i>Glycera alba</i>																										GLYCALBA
<i>Glycera lapidum</i>																			+				+	+		GLYCLAPI
<i>Glycera rouxi</i>																										GLYCROUX
<i>Glycera spec. juv.</i>																				+						GLYCSPEC
<i>Golfingia elongata</i>																										GOLFELON
<i>Golfingia vulgaris</i>																										GOLFVULG
<i>Goniada maculata</i>				+				+			+		+	+												GONIMACU
<i>Goniadella bobretzkii</i>																										GONIBOBR
<i>Goodallia triangularis</i>						+	+													+						GOODTRIA
<i>Gyptis capensis</i>											+															GYPTCAPE
<i>Harmothoe imbricata</i>																										HARMIMBR
<i>Harmothoe impar</i>																										HARMIMPA
<i>Harmothoe spec. juv.</i>				+	+		+	+																		HARMSPEC
<i>Harpinia antennaria</i>				+																						HARPANTE
<i>Heteromastus filiformis</i>																										HETEFILI
<i>Hippomedon denticulatus</i>														+												HIPPDENT
<i>Holothuroidea indet.</i>																										HOLOINDE
<i>Hyala vitrea</i>																										HYALVITR
<i>Hyperidae</i>																										HYPERIID
<i>Ione thoracica</i>																										IONETHOR
<i>Iphinoe trispinosa</i>							+																			IPHITRIS
<i>Labidoplax buski</i>																										LABIBUSK
<i>Lagisca extenuata</i>																										LAGIEXTE
<i>Lanice conchilega</i>					+	+			+	+																LANICONC
<i>Lepton squamosum</i>																										LEPTSQUA
<i>Leptognathia spec.</i>									+																	LEPTSPEC

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area																										
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø21	Ø22	Ø23	Ø24	Ø25	Ø26	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Species name																											Code
<i>Leptosynapta inhaerens</i>																											LEPTINHA
<i>Leucothoe incisa</i>	+			+		+		+			+												+		+		LEUCINCI
<i>Liocarcinus marmoreus</i>																											LIOCMARM
<i>Liocarcinus spec. juv.</i>																											LIOSPEC
<i>Lucinoma borealis</i>																											LUCIBORE
<i>Lumbrineris fragilis</i>																											LUMBFRAG
<i>Lumbrineris latreilli</i>																											LUMBLATR
<i>Lysilla loveni</i>																											LYSILOVE
<i>Macoma balthica</i>																											MACOBALT
<i>Mactra corallina</i>																					+						MACTCORA
<i>Magelona alleni</i>																											MAGEALLE
<i>Magelona johnstoni</i>	+	+	+	+	+		+	+		+	+	+	+	+	+		+										MAGEJOHN
<i>Magelona mirabilis</i>	+		+	+	+		+	+	+		+				+	+											MAGEMIRA
<i>Malmgreniella lunulata</i>	+				+	+				+																	MALMLUNU
<i>Mediomastus fragilis</i>																											MEDIFRAG
<i>Megaluropus agilis</i>								+	+	+			+	+		+	+		+	+		+			+		MEGAAGIL
<i>Metopa rubrovittata</i>													+													+	METORUBR
<i>Mya truncata</i>																											MYATRUNC
<i>Myriochele oculata</i>																											MYRIOCVL
<i>Mysella bidentata</i>					+			+																			MYSEBIDE
<i>Mysia undata</i>																											MYSIUNDA
<i>Nebalia bipes</i>																											NEBABIPE
<i>Nematoda</i>						+															+				+		NEMATODA
<i>Nemertini</i>	+	+	+	+	+	+	+	+	+	+				+						+			+		+		NEMERTIN
<i>Nephtrops norvegicus</i>																											NEPHNORV
<i>Nephtys assimilis</i>					+						+																NEPHASSI
<i>Nephtys caeca</i>															+									+			NEPHCAEC
<i>Nephtys cirrosa</i>	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NEPHCIRR
<i>Nephtys hombergii</i>		+			+	+													+			+		+			NEPHHOMB
<i>Nephtys incisa</i>																											NEPHINCI
<i>Nephtys longosetosa</i>																											NEPHLONG
<i>Nephtys spec. juv.</i>													+		+				+						+		NEPHSPEC
<i>Nereis longissima</i>						+																					NERELONG
<i>Notomastus latericeus</i>				+							+																NOTOLATE
<i>Nucula nitidosa</i>											+																NUCUNITI
<i>Nucula tenuis</i>																											NUCUTENU
<i>Oligochaeta</i>																											OLIGOCHA
<i>Ophelia limacina</i>										+																	OPHELIMA
<i>Ophelina acuminata</i>																											OPHEACUM
<i>Ophiodromus flexuosus</i>																											OPHIFLEX
<i>Ophiura albida</i>	+		+	+			+	+						+													OPHIALBI
<i>Ophiura texturata</i>			+																								OPHITEXT
<i>Ophiura spec. juv.</i>		+				+			+	+					+			+	+						+		OPHISPEC
<i>Orbinia sertulata</i>																											ORBISERT
<i>Orchomene nana</i>			+		+																						ORCHNANA
<i>Orchomene spec. juv.</i>																											ORCHSPEC
<i>Owenia fusiformis</i>																											OWENFUSI
<i>Pagurus bernhardus</i>													+														PAGUBERN
<i>Paraonis fulgens</i>																+	+	+									PARAFULG
<i>Pectinaria auricoma</i>																											PECTAURI
<i>Pectinaria koreni</i>					+																						PECTKORE

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area																										
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø21	Ø22	Ø23	Ø24	Ø25	Ø26	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Species name																											Code
<i>Pelonaia corrugata</i>																											PELOCORR
<i>Periculodes longimanus</i>	+	+		+					+														+				PERILONG
<i>Phaxas pellucidus</i>																											PHAXPELL
<i>Pherusa plumosa</i>																											PHERPLUM
<i>Pholoe minuta</i>					+																						PHOLMINU
<i>Phoronida</i>	+		+	+	+	+		+	+													+	+			+	PHORONID
<i>Photis longicaudata</i>																											PHOTLONG
<i>Phthisica marina</i>				+	+																						PHTHMARI
<i>Phyllodoce groenlandica</i>																											PHYLGROE
<i>Phyllodoce laminosa</i>																											PHYLLAMI
<i>Phyllodoce rosea</i>																											PHYLROSE
<i>Phyllocididae indet.</i>																											PHYLINDE
<i>Podarkeopsis helgolandica</i>																											PODAHELG
<i>Poecilochaetus serpens</i>	+	+	+																				+	+			POECSERP
<i>Polychaeta indet.</i>																											POLYINDE
<i>Polydora ciliata</i>																											POLYCILI
<i>Polydora spec. juv.</i>																											POLYSPEC
<i>Polynoe kinbergi</i>																											POLYKINB
<i>Polyphysia crassa</i>																											POLYCRAS
<i>Pontocrates altamarinus</i>											+	+															PONTALTA
<i>Pontophilus bispinosus</i>																											PONTBISP
<i>Pontophilus trispinosus</i>																											PONTTRIS
<i>Prionospio cirrifera</i>																											PRIOCIRR
<i>Processa nouveli holthuisi</i>																									+		PROCNOHO
<i>Processa parva</i>																											PROCPARV
<i>Pseudocuma longicomis</i>	+	+	+	+	+	+			+				+		+	+		+						+	+		PSEULONG
<i>Rhodine loveni</i>																											RHODLOVE
<i>Saxicavella jeffreysi</i>																											SAXIJEFF
<i>Scalibregma inflatum</i>																											SCALINFL
<i>Scolecopsis bonnieri</i>		+	+			+		+							+							+	+	+	+		SCOLBONN
<i>Scolecopsis foliosa</i>																					+						SCOLFOLI
<i>Scolecopsis squamata</i>																		+									SCOLSQUA
<i>Scoloplos armiger</i>	+	+	+	+			+	+	+	+		+	+	+	+	+		+				+	+	+			SCOLARMI
<i>Scopelocheirus hopi</i>																											SCOPHOPI
<i>Sigalion mathildae</i>	+	+	+	+	+			+																			SIGAMATH
<i>Siphonocetus kroyeranus</i>				+							+				+												SIPHKROY
<i>Spio filicomis</i>	+	+	+									+									+		+		+		SPIOFILI
<i>Spiophanes bombyx</i>	+	+	+		+	+	+	+	+	+	+	+		+	+	+		+	+			+	+	+	+		SPIOBOMB
<i>Spiophanes kroeyeri</i>									+																+		SPIOKROE
<i>Spisula solida</i>																											SPISSOLI
<i>Spisula subtruncata</i>																											SPISSUBT
<i>Sthenelais boa</i>																											STHENBOA
<i>Sthenelais limicola</i>																											STHELIMI
<i>Streptosyllis websteri</i>						+																					STREWEBS
<i>Syllidae spec.</i>																					+						SYLLIDAE
<i>Synchelidium maculatum</i>					+				+				+	+	+							+			+		SYNCMACU
<i>Synelmis klatti</i>																											SYNEKLAT
<i>Tellimya ferruginosa</i>			+	+	+	+		+	+		+			+													TELLFERR
<i>Tellimya tenella</i>																											TELLTENE
<i>Tellina fabula</i>		+	+	+	+	+		+	+		+	+	+		+												TELLFABU
<i>Tellina pygmea</i>						+																+					TELLPYGM

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area																											
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
Species name																											Code	
<i>Tellina tenuis</i>																											TELTENU	
<i>Terebellides stroemi</i>																											TERESTRO	
<i>Thia scutellata</i>																											THIASCUT	
<i>Thracia phaseolina</i>	+																											THRAPHAS
<i>Thyasira flexuosa</i>																											THYAFLEX	
<i>Travisia forbesii</i>																											TRAVFORB	
<i>Tridonta montagui</i>																											TRIDMONT	
<i>Turbellaria spec.</i>																											TURBELLA	
<i>Turritella communis</i>																											TURRCOMM	
<i>Upogebia deltaura</i>																											UPOGDELT	
<i>Upogebia deltaura juv.</i>																											UPOGJUVE	
<i>Upogebia stellata</i>																											UPOGSTEL	
<i>Urothoe brevicornis</i>	+																											UROTBREV
<i>Urothoe poseidonis</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	UROTPOSE		
<i>Venerupis senegalensis</i>																											VENESENE	
<i>Westwoodilla caecula</i>																											WESTCAEC	

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area										Coastal area															
	Of	Of	Of	Of	Of	Of	Of	Of	Of	Of	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa		
	27	28	29	30	31	32	33	34	35	36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Species name																										Code
<i>Abra alba</i>			+												+											ABRAALBA
<i>Abra nitida</i>																										ABRANITI
<i>Abra prismatica</i>																										ABRAPRIS
<i>Acanthocardia echinata</i>																										ACANECHI
<i>Acidostoma obesum</i>																										ACIDOBES
<i>Acrocrida brachiata</i>																										ACROBRAC
<i>Altenaeum dawsoni</i>																										ALTENDAW
<i>Ampelisca brevicornis</i>																										AMPEBREV
<i>Ampelisca tenuicornis</i>																										AMPETENU
<i>Ampharete acutifrons</i>																										AMPHACUT
<i>Branchiostoma lanceolatum</i>																	+									BRANLANC
<i>Amphipoda</i> indet.																										AMPHINDE
<i>Amphiura chiajei</i>																										AMPHCHIA
<i>Amphiura filiformis</i>																										AMPHFILI
<i>Anthozoa spec.</i>			+				+						+												+	ANTHOZOA
<i>Aonides paucibranchiata</i>																										AONIPAUC
<i>Aphelochaeta marioni</i>																										APHEMARI
<i>Aphrodite aculeata</i>																										APHRACUL
<i>Aplacophora</i>																										APLACOPH
<i>Argissa hamatipes</i>																										ARGISHAMA
<i>Aricidea minuta</i>				+			+	+																		ARICMINU
<i>Asterias rubens</i>															+											ASTERUBE
<i>Asteroidea</i> indet.																										ASTEINDE
<i>Astropecten irregularis</i>																										ASTRIIRRE
<i>Atylus falcatus</i>																										ATYLFALC
<i>Atylus swammerdami</i>														+	+	+										ATYLSWAM
<i>Bathyporeia elegans</i>				+	+	+	+				+	+					+		+							BATHELEG
<i>Bathyporeia guilliamsoniana</i>		+		+		+					+		+						+							BATHGUIL
<i>Bathyporeia spec. juv.</i>																				+						BATHSPEC
<i>Bivalve</i> indet.																										BIVAINDE
<i>Bopyrus squillarum</i>																										BOPYSQUI
<i>Brada villosa</i>																										BRADVILL
<i>Brissopsis lyrifera</i>																										BRISLYRI
<i>Callianassa subterranea</i>																										CALLSUBT
<i>Callianassa subterranea juv.</i>																										CALLJUVE
<i>Callianassa tyrnena</i>		+				+													+							CALLTYRR
<i>Callianassa spec. juv.</i>																										CALLSPEC
<i>Capitella capitata</i>															+			+	+	+				+	+	CAPICAPI
<i>Caprellidae spec.</i>																										CAPRELLI
<i>Carcinus maenas</i>																										CARCMANEN
<i>Cerianthus lloydii</i>																										CERILLOY
<i>Chaetopterus variopedatus</i>																										CHAEVARI
<i>Chaetozone setosa</i>			+	+		+					+								+							CHAESETO
<i>Chamelea striatula</i>																			+							CHAMSTRI
<i>Corbula gibba</i>																										CORBGIBB
<i>Corophium affine</i>																										COROAFFI
<i>Corystes cassivelaunus</i>																					</					

Appendix-1 Biomonitoring 2003 (+ = presence)

[illegible]

Appendix-1 Biomonitoring 2003 (+ = presence)

Species name	Offshore area											Coastal area															Code
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	
	27	28	29	30	31	32	33	34	35	36		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Leptosynapta inhaerens</i>																											LEPTINHA
<i>Leucothoe incisa</i>								+														+				+	LEUCINCI
<i>Liocarcinus marmoreus</i>																						+					LIOCMARM
<i>Liocarcinus spec. juv.</i>															+												LIOSPEC
<i>Lucinoma borealis</i>																											LUCIBORE
<i>Lumbrineris fragilis</i>																											LUMBFRAG
<i>Lumbrineris latreilli</i>																											LUMBLATR
<i>Lysilla loveni</i>																											LYSILOVE
<i>Macoma balthica</i>												+	+				+	+									MACOBALT
<i>Mactra corallina</i>																											MACTCORA
<i>Magelona alleni</i>																											MAGEALLE
<i>Magelona johnstoni</i>			+	+	+							+		+	+	+	+	+	+		+		+		+	+	MAGEJOHN
<i>Magelona mirabilis</i>					+	+						+					+	+			+				+	+	MAGEMIRA
<i>Malmgreniella lunulata</i>															+				+						+	+	MALMLUNU
<i>Mediomastus fragilis</i>																											MEDIFRAG
<i>Megaluropus agilis</i>					+		+	+												+							MEGAAGIL
<i>Metopa rubrovittata</i>																											METORUBR
<i>Mya truncata</i>																											MYATRUNC
<i>Myriochele oculata</i>																											MYRIOCUL
<i>Mysella bidentata</i>												+		+	+	+	+				+					+	MYSEBIDE
<i>Mysia undata</i>																											MYSIUNDA
<i>Nebalia bipes</i>																											NEBABIPE
<i>Nematoda</i>			+																								NEMATODA
<i>Nemertini</i>			+	+	+		+	+						+	+					+	+	+			+	+	NEMERTIN
<i>Nephrops norvegicus</i>																											NEPHNORV
<i>Nephtys assimilis</i>																										+	NEPHASSI
<i>Nephtys caeca</i>												+					+				+						NEPHCAEC
<i>Nephtys cirrosa</i>		+	+	+	+	+	+	+	+	+		+	+					+		+	+	+	+			+	NEPHCIIR
<i>Nephtys hombergii</i>							+			+		+	+	+	+	+	+	+	+	+	+			+	+	+	NEPHHOMB
<i>Nephtys incisa</i>																											NEPHINCI
<i>Nephtys longosetosa</i>												+			+					+							NEPHLONG
<i>Nephtys spec. juv.</i>					+		+	+	+		+		+				+								+		NEPHSPEC
<i>Nereis longissima</i>							+						+		+											+	NERELONG
<i>Notomastus latericeus</i>													+							+					+	+	NOTOLATE
<i>Nucula nitidosa</i>																											NUCUNITI
<i>Nucula tenuis</i>																											NUCUTENU
<i>Oligochaeta</i>							+																				OLIGOCHA
<i>Ophelia limacina</i>			+				+		+	+																	OPHEUMA
<i>Ophelina acuminata</i>																											OPHEACUM
<i>Ophiidromus flexuosus</i>																											OPHIFLEX
<i>Ophiura albida</i>			+				+			+																	OPHIALBI
<i>Ophiura texturata</i>													+												+	+	OPHITEXT
<i>Ophiura spec. juv.</i>					+			+							+												OPHISPEC
<i>Orbinia sertulata</i>																											ORBISERT
<i>Orchomene nana</i>			+																								ORCHNANA
<i>Orchomene spec. juv.</i>																											ORCHSPEC
<i>Owenia fusiformis</i>													+							+						+	OWENFUSI
<i>Pagurus bernhardus</i>																											PAGUBERN
<i>Paraonis fulgens</i>			+			+		+																			PARAFULG
<i>Pectinaria auricoma</i>																											PECTAURI
<i>Pectinaria koreni</i>														+						+						+	PECTKORE

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area										Coastal area															Code
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	
Species name	27	28	29	30	31	32	33	34	35	36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Pelonaia corrugata</i>																										PELOCORR
<i>Periculodes longimanus</i>								+																		PERILONG
<i>Phaxas pellucidus</i>																										PHAXPELL
<i>Pherusa plumosa</i>																										PHERPNUM
<i>Pholoe minuta</i>								+																		PHOLMINU
<i>Phoronida</i>	+			+			+	+				+						+	+						+	PHORONID
<i>Photis longicaudata</i>																										PHOTLONG
<i>Phthisica marina</i>				+																				+		PHTHMARI
<i>Phylodoce groenlandica</i>								+														+				PHYLGROE
<i>Phylodoce laminosa</i>															+				+							PHYLLAMI
<i>Phylodoce rosea</i>													+						+							PHYLROSE
<i>Phyllodoce indet.</i>																										PHYLINDE
<i>Podarkeopsis helgolandica</i>																										PODAHELG
<i>Poecilochaetus serpens</i>								+											+					+		POECSERP
<i>Polychaeta indet.</i>	+																									POLYINDE
<i>Polydora ciliata</i>																										POLYCILI
<i>Polydora spec. juv.</i>																										POLYSPEC
<i>Polynoe kinbergi</i>																										POLYKINB
<i>Polyphysia crassa</i>																										POLYCRAS
<i>Pontocrates altamarinus</i>																										PONTALTA
<i>Pontophilus bispinosus</i>																										PONTBISP
<i>Pontophilus trispinosus</i>																										PONTTRIS
<i>Prionospio cirrifera</i>																										PRIOCIRR
<i>Processa novelli holthuisi</i>																										PROCNOHO
<i>Processa parva</i>	+																									PROCPARV
<i>Pseudocuma longicomis</i>				+	+		+	+			+		+		+											PSEULONG
<i>Rhodine loveni</i>																										RHODLOVE
<i>Saxicavella jeffreysi</i>																										SAXJEFF
<i>Scalibregma inflatum</i>																										SCALINFL
<i>Scolecopsis bonnieri</i>																			+	+			+			SCOLBONN
<i>Scolecopsis foliosa</i>																										SCOLFOLI
<i>Scolecopsis squamata</i>																										SCOLSQUA
<i>Scoloplos armiger</i>				+	+		+	+			+						+		+	+	+	+				SCOLARMI
<i>Scopelocheirus hopi</i>																										SCOPHOPI
<i>Sigalion mathildae</i>				+									+		+										+	SIGAMATH
<i>Siphonoecetus kroyeranus</i>								+															+			SIPHKROY
<i>Spio filicomis</i>				+			+	+			+		+	+	+				+					+	+	SPIOFILI
<i>Spiophanes bombyx</i>				+	+		+	+	+		+		+	+	+	+		+	+	+	+	+		+	+	SPIOBOMB
<i>Spiophanes kroeyeri</i>																										SPIOKROE
<i>Spisula solida</i>																										SPISSOLI
<i>Spisula subtruncata</i>		+									+	+	+	+		+		+	+			+				SPISSUBT
<i>Sthenelais boa</i>																				+						STHENBOA
<i>Sthenelais limicola</i>																									+	STHELIMI
<i>Streptosyllis websteri</i>																										STREWEBS
<i>Syllidae spec.</i>								+																		SYLLIDAE
<i>Synchelidium maculatum</i>					+		+										+		+				+			SYNCMACU
<i>Synelmis klatti</i>																										SYNEKLAT
<i>Tellimya ferruginosa</i>				+	+		+	+							+	+				+						TELLFERR
<i>Tellimya tenella</i>																										TELLTENE
<i>Tellina fabula</i>				+	+		+				+	+	+	+	+	+		+	+	+				+	+	TELLFABU
<i>Tellina pygmaea</i>		+	+																							TELLPYGM

Appendix-1 Biomonitoring 2003 (+ = presence)

	Offshore area											Coastal area															
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	Coa	
	27	28	29	30	31	32	33	34	35	36		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Species name																											Code
<i>Tellina tenuis</i>																			+	+	+						TELTENU
<i>Terebellides stroemi</i>																											TERESTRO
<i>Thia scutellata</i>			+				+																				THIASCUT
<i>Thracia phaseolina</i>			+																								THRAPHAS
<i>Thyasira flexuosa</i>																											THYAFLEX
<i>Travisia forbesii</i>			+				+		+																		TRAVFORB
<i>Tridonta montagui</i>																											TRIDMONT
<i>Turbellaria spec.</i>																											TURBELLA
<i>Turritella communis</i>																											TURRCOMM
<i>Upogebia deltaura</i>																											UPOGDELT
<i>Upogebia deltaura juv.</i>																											UPOGJUVE
<i>Upogebia stellata</i>																											UPOGSTEL
<i>Urothoe brevicornis</i>						+	+	+				+	+		+	+	+		+	+	+				+	+	UROTREV
<i>Urothoe poseidonis</i>	+			+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+		+			+	+	UROTPOSE
<i>Venerupis senegalensis</i>																				+							VENESENE
<i>Westwoodilla caecula</i>																											WESTCAEC

Appendix 2, Biomonitoring 2003

station	DOG1		DOG2		DOG3		DOG4		DOG5	
Crustacea	n	b	n	b	n	b	n	b	n	b
acidobes	12.8	0.004	12.8	0.004	12.8	0.004				
ampebrev									12.8	0.004
atylswam	12.8	0.004					12.8	0.004		
batheleg	218.1	0.065	77.0	0.023	230.9	0.069	282.3	0.085	38.5	0.012
bathguil	64.2	0.019	64.2	0.019	38.5	0.012	102.6	0.031		
bathspec	192.5	0.058	64.2	0.019	102.6	0.031	25.7	0.008		
diasbrad			12.8	0.004						
ebalcran			12.8	0.004						
harpante									12.8	0.004
hippdent			12.8	0.004					25.7	0.008
megaagil	25.7	0.008								
orchnana							51.3	0.015		
perilong	38.5	0.012	12.8	0.004			38.5	0.012		
pontaita	38.5	0.012								
pontbisp	12.8	0.069								
pseulong			12.8	0.004			12.8	0.004	25.7	0.008
siphkroy			12.8	0.004			51.3	0.015	25.7	0.008
syncmacu							12.8	0.004		
urotbrev	12.8	0.004	12.8	0.004	38.5	0.012	51.3	0.015		
urotpose	25.7	0.008	166.8	0.050	154.0	0.046	384.9	0.115	12.8	0.004
Echinodermata										
acrobrac			102.6	4.225					77.0	4.499
amphchia	243.8	0.053	115.5	0.023	295.1	2.455	64.2	0.550	166.8	0.133
echicord	12.8	0.283			64.2	2.462			12.8	8.730
echipusi	12.8	0.002			51.3	0.031	243.8	0.030		
ophispec					12.8	0.003				
Mollusca										
abrapris			12.8	0.197					25.7	0.198
chamstri	487.5	1.418	12.8	0.018	12.8	0.013	12.8	0.000	12.8	0.000
corbgibb	25.7	0.088								
cylicyli					12.8	0.000				
donavitt	128.3	0.127								
dosilupi	38.5	0.064			38.5	2.474				
ensiensi							25.7	2.008		
euspcate							12.8	0.414		
euspnti	38.5	0.006	12.8	0.002	25.7	0.017	25.7	0.066	12.8	0.002
gariferv							12.8	0.013		
lucibore									12.8	0.955
mysebide			89.8	0.014	128.3	0.013	12.8	0.003	77.0	0.012
mysiunda									12.8	0.001
nucuniti									12.8	0.010
phaxpell			12.8	0.111						
spissubt			12.8	0.003						
tellfabu	38.5	0.113	461.9	0.403	12.8	0.001	89.8	0.072	166.8	0.428
thraphas	25.7	0.000	12.8	0.002	38.5	0.094			12.8	0.104
thyaflax									12.8	0.037
tridmont	77.0	0.562								
Polychaeta										
chaeseto	25.7	0.014	12.8	0.005	12.8	0.007	25.7	0.037		
eteolong	12.8	0.007								
gonimacu	77.0	0.039	77.0	0.237	38.5	0.078	25.7	0.122	38.5	0.178
harmspec			12.8	0.005					25.7	0.014
laniconc					12.8	1.487				
magealle					25.7	0.063				
magejohn	77.0	0.215	89.8	0.047	25.7	0.014	38.5	0.091	89.8	0.113
magemira	25.7	0.024	461.9	0.244	64.2	0.034	89.8	0.213	230.9	0.075
nephassi			12.8	0.401			12.8	0.747	12.8	0.007
nephcirr	77.0	0.144			141.1	0.134	102.6	0.083		

Appendix 2, Biomonitoring 2003

nephhomb	12.8	0.125			25.7	0.034	25.7	0.244	12.8	0.161
nephspec	51.3	0.027	38.5	0.015						
nerelong	12.8	0.042			12.8	0.078				
notolate	64.2	0.522					51.3	3.594		
ophelima	25.7	0.014								
owenfusi					38.5	0.064				
pholminu					25.7	0.014			12.8	0.007
phylinde									12.8	0.007
scolarmi							12.8	0.019	12.8	0.007
scolbonn					12.8	0.139	12.8	0.019	12.8	0.090
sigamath			25.7	1.194	25.7	0.408	38.5	0.505	25.7	0.867
spiobomb	307.9	0.152	269.4	0.107	320.8	0.169	230.9	0.335	128.3	0.068
spiofili			12.8	0.005						
sthelimi	12.8	0.483	12.8	0.005					12.8	0.007
Miscellaneous taxa										
anthozoa	38.5	0.085	12.8	0.040	12.8	0.200	12.8	1.363		
edwaclap					38.5	0.071	25.7	0.023	12.8	0.011
nemertin	38.5	0.037					25.7	0.085	12.8	0.003
phoronid	179.6	0.027	77.0	0.005	89.8	0.010	795.5	0.210	102.6	0.027
branlanc	12.8	0.017	12.8	0.003	12.8	0.003				
sum	2835.4	5.0	2450.5	7.5	2206.8	10.7	3053.5	11.2	1526.8	16.8
nspc	39		36		35		36		36	
SH-W	3.06		2.78		3.01		2.76		3.03	
Simp	0.07		0.09		0.07		0.11		0.06	

station	DOG6		DOG7		OYS 1		OYS2		OYS3	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampebrev									12.8	0.004
ampetenu					25.7	0.008			12.8	0.004
argishama			38.5	0.012						
batheleg	179.6	0.054	179.6	0.054	38.5	0.012				
bathguil	128.3	0.038	154.0	0.046	12.8	0.004				
bathspec			154.0	0.046						
diasbrad	12.8	0.004								
calljuve					12.8	0.119	141.1	0.631	12.8	0.004
callsubt							25.7	1.486		
coroaffi									38.5	0.012
diasbrad									12.8	0.004
ebalcran			25.7	0.108	12.8	0.443				
eudotrun					12.8	0.004	51.3	0.015	77.0	0.023
harpante					51.3	0.015	12.8	0.004	89.8	0.027
hippdent			12.8	0.004						
ionethor					25.7	0.026	51.3	0.077		
megaagil	12.8	0.004	25.7	0.008						
perilong			89.8	0.027						
ponttris	12.8	0.404								
pseulong			12.8	0.004						
siphkroy	25.7	0.008	51.3	0.015						
syncmacu			12.8	0.004						
urotbrev			12.8	0.004						
urotpose	12.8	0.004	89.8	0.027						
Echinodermata										
acrobrac			25.7	0.384						
amphchia	38.5	0.228	51.3	0.061						
amphfili					2014.3	5.417	603.0	5.103	1834.7	7.102
echicord	12.8	0.024	25.7	0.100					12.8	6.664
ophispec							25.7	0.002		
Mollusca										

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abraelba						1308.7	0.091		
chamstri						12.8	0.001		
corbgibb						667.2	0.216	12.8	0.002
cylicyli				64.2	0.043			128.3	0.023
dosilupi	51.3	0.011							
euspniti			12.8	0.002					
gariferv			38.5	0.037					
hyalvitr			12.8	0.013		25.7	0.026	12.8	0.013
mysebide	12.8	0.001	38.5	0.004	359.2	0.042	705.7	0.075	51.3
mysiunda			25.7	0.048				12.8	0.003
nucuniti					38.5	0.025		25.7	0.012
saxijeff								51.3	0.093
tellfabu	89.8	0.036	115.5	0.023					
tellferr						12.8	0.002		
thraphas			25.7	0.056					
thyaflax					12.8	0.008			
Polychaeta									
amphacut								12.8	0.005
chaeseto	12.8	0.002			51.3	0.020		25.7	0.010
chaevvari								12.8	9.428
dipplglau					64.2	0.032		25.7	0.056
gattcirr								25.7	2.186
glycspec								12.8	0.005
gonimacu	25.7	0.161	38.5	0.212					
lysilove					12.8	1.318			
magejohn	51.3	0.124	12.8	0.007					
magemira	115.5	0.076	179.6	0.095			25.7	0.007	
medifrag								25.7	0.010
nephcirr	64.2	0.056	89.8	0.078					
nephhomb	51.3	0.381	25.7	0.117	51.3	0.962	12.8	0.710	51.3
nephspec			25.7	0.017	12.8	0.005	12.8	0.003	
nerelong								12.8	0.076
notolate			25.7	1.224				25.7	0.317
ophiflex								25.7	0.098
owenfusi	192.5	0.616	12.8	0.008					
ophiflex					25.7	0.125	12.8	0.003	
pectauri					64.2	0.025		25.7	0.010
pectkore			12.8	0.764	38.5	0.015			
pholminu							12.8	0.003	25.7
podahelg							25.7	0.014	
poecserp							12.8	0.003	
polycili								346.4	0.139
polykinb					12.8	0.390			
polyspec								12.8	0.005
rhodlove			102.6	0.119					
scolarmi					12.8	0.005			
scolbonn	12.8	0.015							
sigamath	12.8	0.200	51.3	0.444	12.8	0.005			
spiobomb	115.5	0.594	154.0	0.102			38.5	0.061	
spiokroe								12.8	0.041
spiofili					38.5	0.015	102.6	0.027	
sthelimi					38.5	0.076		12.8	0.047
synekiat					64.2	0.025		51.3	0.020
Miscellaneous taxa									
anthozoa	12.8	0.088						12.8	0.048
edwaclap								64.2	0.135
nemertin	12.8	0.017	12.8	0.037	51.3	3.782	25.7	1.313	12.8
nematoda									12.8
turbella									38.5
echiechi			25.7	0.007					

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phoronid	64.2	0.010	449.1	0.081	38.5	0.008	372.1	0.098	64.2	0.017
pelocorr									12.8	28.559
branlanc			38.5	0.017						
sum	1334.3	3.2	2489.0	4.4	3271.7	13.0	4298.1	10.0	3361.5	55.8
nspc	25		39		29		24		41	
SH-W	2.79		3.14		1.76		2.11		2.12	
Simp	0.07		0.06		0.39		0.17		0.31	

station	OYS4		OYS5		OYS6		OYS7		OYS8	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampetenu	12.8	0.004							12.8	0.004
argishama	12.8	0.004					12.8	0.004	12.8	0.004
batheleg	25.7	0.008			51.3	0.015				
bathguil					12.8	0.004				
calljuve			12.8	0.012					51.3	0.142
callsbt			102.6	7.486	12.8	1.919			141.1	13.146
caprelli							12.8	0.004		
diasbrad					12.8	0.004			25.7	0.008
ebalspec							25.7	0.008		
eudotrun			12.8	0.004	12.8	0.004	25.7	0.008	12.8	0.004
harpante			25.7	0.008	12.8	0.004	12.8	0.004	12.8	0.004
hippdent	12.8	0.004								
hyperiid					12.8	0.004				
ionethor									25.7	0.026
leucinci	12.8	0.004								
photlong			141.1	0.042						
westcaec					12.8	0.004	12.8	0.004		
Echinodermata										
acrobrac	51.3	2.155								
amphilli			154.0	0.767	1206.0	9.980	1347.2	3.831		
astrirre					12.8	2.290				
echicord							12.8	0.510		
labibusk							141.1	0.356		
ophialbi									346.4	4.088
Mollusca										
abraalba							12.8	0.002	269.4	0.014
abraniti					12.8	0.004				
abrapris	12.8	0.021								
aplacoph							12.8	0.007		
bivainde	12.8	0.001								
chamstri	25.7	0.001								
corbgibb	89.8	0.054	256.6	0.565			25.7	0.011	89.8	0.035
cylicyli	38.5	0.211	12.8	0.002	25.7	0.109	25.7	0.012		
dosilupi	25.7	0.038			12.8	3.340				
euspniti	38.5	0.027							51.3	0.049
gariferv	12.8	14.391			12.8	0.002				
hyalvitr			243.8	0.244	12.8	0.013	25.7	0.026		
lucibore					12.8	0.469				
mysebide			38.5	0.004					25.7	0.001
mysiunda							12.8	0.001		
nucuniti	25.7	0.034							64.2	0.440
nucutenu					834.0	0.303	25.7	0.016		
phaxpell					12.8	0.002				
spissbt			12.8	0.004						
tellfabu	141.1	0.015								
thraphas									38.5	0.002
thyaflax	218.1	0.294			12.8	0.037				
Polychaeta										

Appendix 2, Biomonitoring 2003

aonipauc							12.8	0.002		
aphracul									12.8	42.820
bradvill							12.8	0.105		
chaeseto	38.5	0.020					12.8	0.002		
chaevvari			12.8	2.183						
diplglau	25.7	0.014	25.7	0.024			38.5	0.051	25.7	0.068
eteolong	12.8	0.007								
eumisang	12.8	0.049								
gattcirr			12.8	0.860						
glycalba			12.8	0.012						
glycspec			12.8	0.012						
gonimacu	38.5	0.008								
gyptcape	12.8	0.007	25.7	0.024	25.7	0.010			51.3	0.051
harmimpa									12.8	0.041
harmspec	12.8	0.007								
laniconc					51.3	3.374				
lumblatr									12.8	0.053
magealle	38.5	0.278	12.8	0.012						
magejohn	295.1	0.127								
magemira	628.7	0.269	12.8	0.012	102.6	0.041	12.8	0.002		
medifrag									102.6	0.029
myriocul					25.7	0.010	12.8	0.002	12.8	0.008
nephhomb	25.7	0.156			51.3	1.028	51.3	0.268	12.8	0.115
nephinci			12.8	0.528						
nephspec			12.8	0.012					12.8	0.005
nerelong			12.8	0.012					12.8	0.056
notolate	64.2	2.266	25.7	0.559	12.8	0.418			12.8	0.855
ophiflex							12.8	0.017	12.8	0.059
owenfusi					38.5	0.015			12.8	0.022
parafulg							12.8	0.002		
pectauri					12.8	0.005				
pectkore			77.0	0.071			12.8	0.002		
pherplum							25.7	0.249		
pholminu	38.5	0.020			154.0	0.061	38.5	0.005	12.8	0.008
poecserp	12.8	0.036							25.7	0.039
polycili									25.7	0.017
polycras							12.8	1.346		
rhodlove							25.7	0.752		
scolarmi	38.5	0.058			51.3	0.020			38.5	0.053
sigamath	12.8	0.007								
spiobomb	192.5	0.618	25.7	0.024	128.3	0.059			12.8	0.008
spiokroe							25.7	0.068		
spiofili	38.5	0.020			12.8	0.005				
sthelimi	12.8	0.134								
syneklat							12.8	0.002		
terestro							64.2	0.085		
Miscellaneous taxa										
cerilloy			12.8	19.707	25.7	0.104	12.8	0.226		
edwaclap	12.8	0.028								
nemertin	51.3	0.113	25.7	2.049	12.8	0.054			64.2	0.161
oligocha									12.8	0.002
turbella							12.8	0.003		
phoronid	51.3	0.014	205.3	0.068	474.7	0.188	128.3	0.034	1180.4	0.312
branlanc	12.8	0.006								
sum	2450.5	21.5	1552.4	35.3	3489.8	23.9	2296.6	8.0	2861.1	62.7
nspc	40		28		34		36		36	
SH-W	2.89		2.68		2.18		2.00		2.39	
Simp	0.10		0.09		0.20		0.35		0.20	

Appendix 2, Biomonitoring 2003

station	OYS9		OYS10		OYS11		OYS12		OYS13	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampebrev							12.8	0.004		
batheleg	12.8	0.004	12.8	0.004					12.8	0.004
bopysqui					12.8	0.252				
calljuve	38.5	0.156	12.8	0.106	38.5	0.027	38.5	0.044		
callsbt	64.2	3.691	25.7	2.502	218.1	10.897	115.5	7.028	12.8	0.926
corycass	12.8	11.020								
diasbrad			12.8	0.004					25.7	0.008
eudodefo	51.3	0.015								
eudotrun			38.5	0.012						
harpante	51.3	0.015	25.7	0.008	12.8	0.004	12.8	0.004	38.5	0.012
ionethor					77.0	0.077			25.7	0.046
leucinci					25.7	0.008				
perilong									12.8	0.004
upogdelt					51.3	31.379	25.7	15.282		
upogjuve					25.7	0.085				
urotpose	51.3	0.015								
Echinodermata										
amphili			2399.2	11.298	192.5	2.274	102.6	0.057	1064.9	5.741
echicord			12.8	2.783					12.8	2.783
leptinha					12.8	0.606				
Mollusca										
abraalba			333.6	0.041	115.5	0.071				
chamstri									12.8	0.001
corbgibb	12.8	0.010			51.3	0.167				
cylicyli			89.8	0.066					12.8	0.006
dosilupi	12.8	2.142	12.8	0.851						
euspniti	12.8	0.004			25.7	0.013			25.7	0.218
hyalvitr			12.8	0.013			25.7	0.026		
leptsqua					12.8	0.003				
lucibore									12.8	0.434
mysebide	25.7	0.002			102.6	0.012	12.8	0.001	590.2	0.108
nucuniti	89.8	0.167	89.8	0.054			25.7	0.004	51.3	0.037
phaxpell									12.8	0.004
tellferr	12.8	0.004								
thyaiflex									12.8	0.001
Polychaeta										
chaeseto	25.7	0.017	38.5	0.024					25.7	0.027
diplglau	25.7	0.053	128.3	0.317	12.8	0.014			64.2	0.120
eteofoli			12.8	0.027						
glycspec							12.8	0.005		
gonimacu	25.7	0.102			12.8	0.078				
gyptcape			12.8	0.051	12.8	0.003				
lumbfrag							12.8	0.005		
lysilove									12.8	3.269
magealle									12.8	0.029
magejohn	141.1	0.103								
magemira	77.0	0.056	12.8	0.005						
medifrag					89.8	0.024	12.8	0.005		
myriocul	12.8	0.008	12.8	0.005	51.3	0.014				
nephcaec					12.8	4.933				
nephcirr			12.8	0.053						
nephhomb	25.7	1.514	38.5	0.496	12.8	0.019			12.8	0.061
nephinci					12.8	0.738	12.8	0.427		
nephspec					25.7	0.007				
nerelong	12.8	0.066			12.8	0.044	12.8	0.053		
notolate	12.8	0.008								

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ophiflex	64.2	0.222			12.8	0.003	25.7	0.056	12.8	0.049
owenfusi									12.8	0.003
pectkore			12.8	0.005			25.7	0.010		
pholminu			166.8	0.039	12.8	0.002			38.5	0.015
poecserp	12.8	0.008					12.8	0.005		
polycili							38.5	0.017		
polyspec					38.5	0.010				
priocirr					25.7	0.007				
scolarmi			38.5	0.015					38.5	0.024
sigamath	25.7	0.322								
spiobomb			25.7	0.010	25.7	0.007			51.3	0.020
spiofili							12.8	0.005	12.8	0.005
sthelimi			25.7	0.061					12.8	0.005
syneklat	12.8	0.008	12.8	0.005			12.8	0.005	25.7	0.010
Miscellaneous taxa										
edwaclap									12.8	0.008
nemertin			12.8	1.109						
turbella			38.5	0.008			12.8	0.003	12.8	0.002
golfelon					12.8	0.039				
golfulvg					12.8	0.056	38.5	0.642		
phoronid	102.6	0.020	77.0	0.020	1360.0	0.359	38.5	0.008	77.0	0.020
sum	1026.4	19.8	3759.2	20.0	2732.8	52.2	654.3	23.7	2373.6	14.0
nspc	27		30		33		23		32	
SH-W	2.99		1.66		2.19		2.82		2.03	
Simp	0.05		0.42		0.26		0.06		0.26	

station	OYS14		OYS15		OYS16		OYS17		OYS18	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampebrev					12.8	0.004				
ampetenu	12.8	0.004	38.5	0.012	12.8	0.004				
batheleg			12.8	0.004			38.5	0.012		
calljuve	77.0	0.189	38.5	0.140	12.8	0.006			64.2	0.154
callsubt	77.0	6.715	77.0	5.356	12.8	0.248	25.7	0.962	89.8	3.050
caprelli	12.8	0.004								
diasbrad									12.8	0.004
eudodefo							51.3	0.015		
eudotrun			12.8	0.004	12.8	0.004			12.8	0.004
harpante			38.5	0.012	115.5	0.035	51.3	0.015	51.3	0.015
ionethor	12.8	0.004	25.7	0.006			25.7	0.029	38.5	0.025
leucinci									12.8	0.004
nephnorv	12.8	62.011								
orchnana									12.8	0.004
perilong					12.8	0.004			12.8	0.004
pseulong									12.8	0.004
upogdelt	12.8	1.109								
upogstel			12.8	0.762						
urotbrev							25.7	0.008		
urotpose							25.7	0.008	12.8	0.004
westcaec			25.7	0.008						
Echinodermata										
amphfili	243.8	0.846	307.9	2.247	1911.7	5.338	179.6	0.947	987.9	4.758
astrirre							25.7	0.005		
echicord	12.8	0.972			12.8	1.467			77.0	12.791
ophispec							12.8	0.000	25.7	0.000
Mollusca										
abraalba			38.5	0.004					51.3	0.003
acanechi			12.8	0.001						
corbgibb	77.0	0.276	38.5	0.011	218.1	0.096	141.1	0.030	6107.1	2.278

Appendix 2, Biomonitoring 2003

cylicyli					12.8	0.017			192.5	0.033
dosilupi									12.8	0.007
hyalvitr	89.8	0.090	77.0	0.077	25.7	0.026			25.7	0.114
mysebide			12.8	0.001	141.1	0.015	128.3	0.014	949.4	0.143
nucuniti	38.5	0.109	38.5	0.006	89.8	0.020	25.7	0.016	77.0	0.035
phaxpell									12.8	0.273
tellfabu									12.8	0.000
tellferr					38.5	0.022			192.5	0.150
thraphas							25.7	0.002	154.0	0.013
turrcomm					12.8	0.580				
Polychaeta										
aonipauc	12.8	0.003	51.3	0.014						
aphemari			38.5	0.020						
chaeseto			77.0	0.041	25.7	0.010	51.3	0.020	38.5	0.030
diplglau							51.3	0.142		
eumisang	12.8	0.003							12.8	0.010
glycroux			12.8	1.695						
glycspec	12.8	0.003					12.8	0.005		
gonimacu	12.8	0.003					12.8	0.029	51.3	0.117
gyptcape					12.8	0.017				
harmimbr	12.8	0.090	12.8	0.007						
harmspec									12.8	0.010
lagiexte									12.8	0.097
laniconc									25.7	1.594
magealle							12.8	0.019		
magejohn					12.8	0.005	51.3	0.075	25.7	0.020
magemira									230.9	0.168
nephcirr			12.8	0.081						
nephhomb					77.0	0.789			38.5	0.364
nephinci	12.8	0.271	12.8	0.589						
nephlong	25.7	0.061								
nephspec			38.5	0.020			25.7	0.010		
nerelong			12.8	0.020					25.7	0.240
notolate	12.8	1.292			38.5	0.303				
opheacum	12.8	0.054								
ophiflex	51.3	0.188	25.7	0.137	12.8	0.046	38.5	0.196	25.7	0.107
orbisert			12.8	2.171						
owenfusi					38.5	0.056	12.8	0.003		
parafulg	25.7	0.007	25.7	0.007						
pectauri			25.7	0.183			12.8	0.005		
pectkore			51.3	0.014						
pholminu					89.8	0.024			89.8	0.071
phylrose									12.8	0.010
polycili					12.8	0.005				
scolarmi							38.5	0.029		
sigamath							12.8	0.007		
spiobomb	12.8	0.003					12.8	0.005	218.1	0.158
spiofili	89.8	0.024	141.1	0.069			12.8	0.005	12.8	0.010
sthelimi					25.7	0.085	12.8	0.046		
syneklat	12.8	0.003					12.8	0.005		
Miscellaneous taxa										
edwaclap	25.7	0.308			64.2	0.234	12.8	0.006		
nemertin							12.8	0.048	12.8	0.223
nematoda									12.8	0.003
turbella	12.8	0.010								
golfvulg			12.8	0.244						
phoronid	38.5	0.010	141.1	0.042	487.5	0.193	102.6	0.027	333.6	0.088
sum	1077.7	74.7	1513.9	14.0	3553.9	9.7	1295.8	2.7	10405.1	27.2
nspc	29		33		28		33		43	

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SH-W	2.86	3.03	1.88	3.11	1.80
Simp	0.08	0.07	0.31	0.05	0.36

station	OYS19		OYS20		OYS21		OYS22		OYS23	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampetenu	38.5	0.012	12.8	0.004	12.8	0.004	12.8	0.004	12.8	0.004
batheleg									12.8	0.004
calljuve			38.5	0.090	25.7	0.056	25.7	0.090		
callsubt	25.7	2.848	77.0	3.874	141.1	8.951	38.5	6.235	12.8	0.824
eudotrun	12.8	0.004			12.8	0.004			64.2	0.019
harpante			12.8	0.004			25.7	0.008	77.0	0.023
ionethor			25.7	0.037	12.8	0.015				
leptspec							12.8	0.004		
perilong			12.8	0.004					25.7	0.008
pseulong							25.7	0.008		
upogdelt					12.8	4.561				
upogjuve					12.8	0.042				
urotpose					12.8	0.004				
Echinodermata										
amphfili	731.3	3.050	115.5	1.096	64.2	0.738	808.3	3.928	1077.7	7.124
asteinde	12.8	0.003					12.8	0.003		
brislyri	25.7	11.219	38.5	36.194						
echicord			12.8	0.019						
leptinha					64.2	0.387				
ophialbi					12.8	0.632				
ophispec					64.2	0.001				
Mollusca										
abraalba			12.8	0.000	718.5	0.040			25.7	0.225
abraniti	12.8	0.017								
abrapris									12.8	0.240
chamstri			12.8	0.001						
corbgibb					102.6	0.056	38.5	0.030		
cylicyli	25.7	0.014	25.7	0.083	12.8	0.006	12.8	0.017	12.8	0.017
devoperr					12.8	0.014				
euspniti					12.8	0.004			25.7	0.036
gariferv			12.8	0.001						
hyalvitr	25.7	0.026			38.5	0.038				
leptsqua					12.8	0.034				
mactcora			12.8	0.009						
mysebide	77.0	0.007	12.8	0.001	25.7	0.002	423.4	0.038	372.1	0.051
mysiunda	12.8	0.102					25.7	0.002		
nucuniti	89.8	0.044			12.8	0.014	166.8	0.107	38.5	0.027
phaxpell							12.8	0.158		
spissubt									12.8	0.004
tellfabu									38.5	0.009
telltene	12.8	0.001	64.2	0.045						
thraphas									12.8	0.001
thyaflax							89.8	0.132	115.5	0.191
Polychaeta										
aonipauc					12.8	0.002				
chaeseto	89.8	0.051					64.2	0.039	12.8	0.005
chaevani							12.8	1.478		
dipiglau	51.3	0.134	12.8	0.005			154.0	0.190	115.5	0.042
driffilu			12.8	1.177						
glycalba	12.8	0.078								
glycspec			25.7	0.008						
gonimacu							12.8	0.008	64.2	0.046
gyptcape					38.5	0.071				

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lumblatr			25.7	0.046	12.8	0.002				
lysilove							12.8	1.595		
magealle	12.8	0.068							12.8	0.076
magemira			25.7	0.008			12.8	0.008	243.8	0.061
malmlunu					25.7	0.410				
medifrag					38.5	0.005				
myriocul					166.8	0.022				
nephhomb					12.8	0.061	38.5	0.251	12.8	0.235
nephspec			12.8	0.005						
nerelong					12.8	0.030				
notolate			12.8	0.605	12.8	0.904				
ophelima			12.8	0.075						
ophiflex			12.8	0.025			12.8	0.063	12.8	0.027
owenfusi							12.8	0.007	12.8	0.007
pectauri							25.7	0.017		
pholminu	64.2	0.025					51.3	0.030	115.5	0.042
phylinde									12.8	0.003
polycili	38.5	0.015								
polykinb							12.8	0.356		
scolami	25.7	0.010					38.5	0.024	192.5	0.071
spiobomb	12.8	0.005			12.8	0.002	12.8	0.008	12.8	0.007
spiofili	12.8	0.005								
sthelimi	25.7	0.098					12.8	0.008		
syneklat			25.7	0.008			25.7	0.017		
Miscellaneous taxa										
edwaciap									12.8	0.003
nemertin			12.8	0.082	25.7	3.190	12.8	0.037	12.8	0.008
phoronid	513.2	0.203	25.7	0.007	154.0	0.041	154.0	0.041	64.2	0.017
sum	1963.0	18.0	718.5	43.5	1924.5	20.3	2412.0	14.9	2861.1	9.5
nspc	24		28		33		33		32	
SH-W	2.13		3.05		2.54		2.48		2.40	
Simp	0.21		0.05		0.16		0.16		0.17	

station	OYS24		OYS25		OYS26		OYS27		OYS28	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampebrev			12.8	0.004						
ampetenu			25.7	0.008	38.5	0.012				
batheleg									25.7	0.008
calljuve	115.5	0.217	12.8	0.052	38.5	0.038				
callsbt	141.1	5.163	12.8	0.739	51.3	3.389			102.6	3.870
diasbrad	12.8	0.004	25.7	0.008			12.8	0.004		
eudodefo									12.8	0.004
eudotrun	38.5	0.012					12.8	0.004	12.8	0.004
harpante	25.7	0.008	12.8	0.004			38.5	0.012	12.8	0.004
ionethor			25.7	0.031						
leucinci					12.8	0.004			12.8	0.004
orchnana			12.8	0.004						
procnoho			25.7	0.985						
upogdelt					12.8	8.803				
upogjuve			12.8	0.015	25.7	0.173				
upogstel					25.7	3.622				
Echinodermata										
amphfili			564.5	2.159	141.1	0.419	256.6	1.534		
astrirre							12.8	2.096		
echicord			12.8	0.003			12.8	3.949		
ophialbi					12.8	0.210				
ophispec	38.5	0.000								
Mollusca										

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abraalba	141.1	0.013	12.8	0.002			25.7	0.001		
chamstri							12.8	0.038		
corbgibb			51.3	0.050	25.7	0.114	218.1	0.636	12.8	0.001
cylicyli			25.7	0.016			12.8	0.004		
ensisili									12.8	57.451
euspniti	38.5	0.018					25.7	0.485		
hyalvitr			25.7	0.026	12.8	0.013				
leptsqua					12.8	0.066				
mysebide	12.8	0.004	12.8	0.001	12.8	0.001	51.3	0.008		
nucuniti			64.2	0.028					25.7	0.173
spissubt	38.5	0.118								
tellferr	12.8	0.002	12.8	0.004			25.7	0.036		
Polychaeta										
chaeseto			51.3	0.027						
chaevani							25.7	10.232		
diplglau									12.8	0.008
gattcirr							25.7	1.194		
glycalba			12.8	0.225	25.7	2.879				
gattcirr					12.8	1.248				
glycspec					12.8	0.005				
gonimacu	12.8	0.005	12.8	0.007	12.8	0.005	25.7	0.032	12.8	0.008
gyptcape	51.3	0.019					12.8	0.003	12.8	0.008
lumblatr	25.7	0.095	12.8	0.066	12.8	0.061				
magejohn							25.7	0.005	166.8	0.171
magemira							166.8	0.034		
malmlunu	12.8	0.005								
medifrag	51.3	0.019								
myriocul					25.7	0.010				
nephassi	12.8	1.087								
nephhomb			25.7	0.180						
nephinci					25.7	0.611				
nephspec	25.7	0.010			25.7	0.010				
nerelong					12.8	0.933				
notolate	51.3	1.783			12.8	1.021				
ophiflex							12.8	0.032	12.8	0.008
pectkore			12.8	0.007	12.8	0.005				
pholminu			12.8	0.007	12.8	0.005	64.2	0.014		
polycili					12.8	0.005				
scalinfl	77.0	0.029								
sigamath							12.8	0.073	38.5	0.457
spiobomb			12.8	0.007						
spiofili	25.7	0.010	89.8	0.047	64.2	0.022	12.8	0.003		
sthelimi	12.8	0.032	12.8	0.030						
syneklat							38.5	0.008	12.8	0.008
Miscellaneous taxa										
nemertin	12.8	0.011			25.7	3.949	12.8	0.020	25.7	12.244
turbella							25.7	0.007		
golfelon					12.8	0.235				
golfvulg					51.3	0.215	12.8	0.005		
phoronid	282.3	0.075	51.3	0.014	307.9	0.081	51.3	0.014	38.5	0.017
branlanc							12.8	0.023		
sum	1270.2	8.7	1270.2	4.8	1103.4	28.2	1257.3	20.5	564.5	74.4
nspc	24		30		31		29		18	
SH-W	2.71		2.43		2.83		2.77		2.40	
Simp	0.09		0.21		0.10		0.09		0.12	

station	OYS29		OYS30		OYS31		OYS32		OYS33	
Crustacea	n	b	n	b	n	b	n	b	n	b

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ampebrev									38.5	0.012
ampetenu						25.7	0.008			
batheleg	12.8	0.004								
calljuve	12.8	0.012	12.8	0.008	64.2	0.085	77.0	0.308	12.8	0.042
callsbt	25.7	1.957	38.5	2.138	89.8	1.528	25.7	3.581	25.7	2.758
diasbrad			12.8	0.004			12.8	0.004	12.8	0.004
eudotrun			25.7	0.008	12.8	0.004				
harpante	25.7	0.008			179.6	0.054	12.8	0.004	38.5	0.012
hippdent	51.3	0.015								
ionethor			25.7	0.026	12.8	0.017				
leucinci			12.8	0.004	25.7	0.008				
nebabipe							12.8	0.027	12.8	0.004
perilong	12.8	0.004								
procnoho	25.7	0.177								
scophopi									12.8	0.004
upogdelt					12.8	2.115				
upogjuve					12.8	0.094				
upogstel									12.8	2.327
urotbrev					25.7	0.008				
urotpose					25.7	0.008				
Echinodermata										
amphfili	38.5	0.043			461.9	3.217	834.0	1.627	1950.2	3.285
echicord			89.8	16.338					12.8	2.237
ophialbi					12.8	0.001				
ophispec	12.8	0.000								
Mollusca										
abraalba	25.7	0.111	51.3	0.009						
corbgibb			12.8	0.002	51.3	0.042	680.0	4.194	25.7	0.092
cylicyli	25.7	0.051					25.7	0.007	51.3	0.039
euspniti	12.8	0.004			12.8	0.002	12.8	0.009		
hyaalitr							38.5	0.038		
mysebide	12.8	0.001	38.5	0.011	243.8	0.016	307.9	0.023	25.7	0.003
mysiunda									12.8	0.001
nucuniti	102.6	0.569			38.5	0.062	25.7	0.024		
phaxpell					12.8	0.001	51.3	0.011		
spissoli			12.8	2.424						
tellfabu	64.2	0.062								
tellferr			38.5	0.041					25.7	0.013
thyaflax	230.9	0.403								
turrcomm					12.8	3.264				
Polychaeta										
aphracul							12.8	0.003		
chaeseto									64.2	0.017
diplglau	25.7	0.014			12.8	0.051			12.8	0.003
glycalba					38.5	0.146	12.8	0.044		
gonimacu	25.7	0.014			12.8	0.003	12.8	0.003		
gyptcape	12.8	0.007	25.7	0.024	38.5	0.010	12.8	0.003		
harmspec	12.8	0.007								
lumblatr			12.8	0.012	12.8	0.003	25.7	0.007		
magealle	38.5	0.576			12.8	0.003				
magejohn	89.8	0.047								
magemira	166.8	0.088			25.7	0.007				
medifrag			12.8	0.003	12.8	0.003				
nephcaec	12.8	1.419								
nephhomb	38.5	0.152	25.7	0.024	12.8	0.003			25.7	0.061
nephinci							38.5	1.163		
nephspec					12.8	0.003			25.7	0.007
nereelong					12.8	0.445			12.8	0.019
notolate	77.0	8.927								

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opheacum					12.8	0.039				
ophelima			12.8	0.003						
ophiflex			12.8	0.053	12.8	0.075	12.8	0.064		
owenfusi	12.8	0.007							12.8	0.010
parafulg					12.8	0.005			12.8	0.003
pectauri							25.7	0.007	38.5	0.010
pectore					25.7	0.007			12.8	0.003
pholminu	12.8	0.007	25.7	0.005	38.5	0.010	102.6	0.027		
polycili					128.3	0.034	12.8	0.003		
scalinfl			38.5	0.008						
scolarmi	38.5	0.020								
sigamath	12.8	0.012								
spiobomb	64.2	0.034	12.8	0.012	12.8	0.003				
spiofili	12.8	0.007			64.2	0.017			51.3	0.014
sthelimi	25.7	0.015	12.8	0.003					25.7	0.037
syneklat	12.8	0.007			25.7	0.007			25.7	0.007
Miscellaneous taxa										
cerilloy	12.8	0.008								
edwaclap	12.8	0.025								
nemertin	25.7	0.096	25.7	1.129	25.7	0.048	12.8	0.011		
turbella			12.8	0.003						
echiechi	936.6	0.149								
golfulg									12.8	0.005
phoronid	89.8	0.024	256.6	0.068	128.3	0.034	141.1	0.037	141.1	0.037
sum	2463.4	15.1	859.6	22.4	2001.5	11.5	2566.0	11.2	2745.6	11.1
nspc	39		25		40		26		29	
SH-W	2.65		2.70		2.96		2.14		1.49	
Simp	0.16		0.11		0.09		0.19		0.51	

station	OYS34		OYS35		OYS36		OYS37		OYS38	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampetenu					12.8	0.004				
bathguil					12.8	0.004				
calljuve	89.8	0.067	64.2	0.077	102.6	0.404	64.2	0.090	64.2	0.096
callsub	128.3	8.762	102.6	7.001	89.8	6.988	64.2	2.471	64.2	7.469
diasbrad	12.8	0.004	12.8	0.004			12.8	0.004		
eudotrun	38.5	0.012			25.7	0.008				
harpante	12.8	0.004	38.5	0.012	38.5	0.012	38.5	0.012		
hippdent							12.8	0.004		
ionethor	12.8	0.013	12.8	0.013	12.8	0.013	38.5	0.048		
leucinci					38.5	0.012			25.7	0.008
nebabipe							77.0	0.023		
orchnana			12.8	0.004	12.8	0.004	269.4	0.081		
pseulong									12.8	0.004
upogstel							25.7	2.071		
Echinodermata										
amphfili	25.7	0.106	192.5	2.797	218.1	3.186	551.7	0.718	12.8	0.017
asteinde			12.8	0.003						
echicord	12.8	0.120	12.8	10.451	12.8	0.606			51.3	6.164
ophialbi					25.7	0.002				
ophispec	12.8	0.002	12.8	0.000						
Mollusca										
abraalba	141.1	0.016			128.3	0.084			25.7	0.002
altendaw							51.3	0.002		
corbgibb	25.7	0.148			12.8	0.028	115.5	0.100		
cylicyli			12.8	0.012			12.8	0.012		
euspniti	51.3	0.026			12.8	0.009			25.7	0.038
hyalvitr					25.7	0.026	12.8	0.013		
leptsqua	12.8	0.001			12.8	0.043				
myatrunc			12.8	4.380						

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mysebide	77.0	0.009	141.1	0.010	64.2	0.004			89.8	0.015
nucuniti			38.5	0.006	51.3	0.015	102.6	0.034	25.7	0.006
phaxpell					12.8	0.011	12.8	0.001		
tellferr					12.8	0.011	12.8	0.004	25.7	0.009
Polychaeta										
chaeseto							12.8	0.008		
chaevvari			12.8	4.000						
diplglau			12.8	0.003	141.1	0.359	12.8	0.008		
gattcirr			12.8	1.485						
glycroux							12.8	0.715		
glycspec			12.8	0.003	12.8	0.020	12.8	0.008		
gonimacu					12.8	0.020				
gyptcape	38.5	0.012			12.8	0.020				
lumblatr	115.5	0.235			64.2	0.098				
magealle			12.8	0.103						
magejohn									12.8	0.003
magemira			25.7	0.007						
medifrag	77.0	0.024								
myriocul					384.9	0.024			12.8	0.003
nephcirr					38.5	0.058				
nephhomb			51.3	1.900						
nephspec							12.8	0.008		
nerelong	12.8	0.498					12.8	0.008		
notolate	12.8	0.003	12.8	0.224						
ophiflex	12.8	0.090	12.8	0.051	12.8	0.020				
owenfusi			25.7	0.020						
parafulg							12.8	0.002		
pectkore							38.5	0.024		
pholminu			38.5	0.012						
poecserp	25.7	0.008			12.8	0.020				
scalinfl									25.7	0.005
sigamath									12.8	0.327
spiobomb			25.7	0.007					12.8	0.003
spiofili			12.8	0.003	12.8	0.005	38.5	0.024		
sthelimi					12.8	0.020	38.5	0.196	12.8	0.022
syneklat			38.5	0.012					12.8	0.003
Miscellaneous taxa										
nemertin	12.8	0.023			12.8	0.316	12.8	0.088		
oligocha	12.8	0.003					12.8	0.008		
turbella			38.5	0.003					12.8	0.002
golfvulg							128.3	1.443		
phoronid	551.7	0.218	179.6	0.047	269.4	0.071	77.0	0.024	1424.1	0.376
sum	1526.8	10.4	1206.0	32.7	1937.3	12.5	1911.7	8.3	1963.0	14.6
nspc	24		30		34		31		20	
SH-W	2.41		2.90		2.84		2.68		1.33	
Simp	0.16		0.07		0.09		0.12		0.53	

station	OYS39		OYS40		OYS41		OYS42		OFF 1	
Crustacea	n	b	n	b	n	b	n	b	n	b
ampetenu	51.3	0.015								
amphinde			12.8	0.004						
batheleg	12.8	0.004	38.5	0.012	102.6	0.031	64.2	0.019	25.7	0.008
bathguil			12.8	0.004	12.8	0.004	38.5	0.012		
calljuve	25.7	0.087					12.8	0.058		
callsubt	25.7	3.589			12.8	1.407				
calltyrr									25.7	1.141
caprelli			12.8	0.004						
diasbrad			12.8	0.004	25.7	0.008				
eudotrun			12.8	0.004			12.8	0.004		

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harpante	102.6	0.031	12.8	0.004	12.8	0.004				
leucinci									25.7	0.008
perilong			12.8	0.004			12.8	0.004	12.8	0.004
phthmari							89.8	0.027		
pseulong									12.8	0.004
siphkroy							38.5	0.012		
urotbrev							12.8	0.004		
urotpose							166.8	0.050	38.5	0.012
Echinodermata										
acrobrac					25.7	1.708			12.8	1.363
amphlili	2437.7	6.299	179.6	1.978	12.8	0.056	38.5	0.149		
asteinde					12.8	0.003				
echicord							12.8	0.510		
echipusi							12.8	0.002		
ophialbi							12.8	0.348	51.3	0.013
ophispec			12.8	0.000	230.9	0.013	12.8	0.000		
Mollusca										
aplacoph	25.7	0.124								
chamstri			12.8	0.003	12.8	0.305				
corbgibb			12.8	0.002	12.8	0.035	102.6	0.034		
cylicyli	102.6	0.032	12.8	0.006	25.7	0.077	12.8	0.001		
dosilupi					12.8	0.007				
euspniti							38.5	0.008	38.5	0.068
goodtria			12.8	0.001	12.8	0.000				
myatrunc							12.8	1.516		
mysebide	64.2	0.009	38.5	0.006	38.5	0.002	102.6	0.014		
mysiunda					12.8	0.001				
nucuniti	179.6	0.082	64.2	0.058	25.7	0.166				
phaxpell	25.7	0.005	12.8	0.087						
tellfabu					51.3	0.051	12.8	0.000	64.2	1.385
tellferr					12.8	0.009	51.3	0.024		
thraphas							12.8	0.002	12.8	0.002
thyaflax	12.8	0.001	12.8	0.011	77.0	0.166				
Polychaeta										
chaeseto	38.5	0.053	12.8	0.005	64.2	0.017				
chaevvari	12.8	12.615								
dipglau	51.3	0.053			51.3	0.014				
eteolong			25.7	0.010						
eumisang	12.8	0.012								
gonibobr					12.8	0.003				
gonimacu					38.5	0.053	64.2	0.159		
laniconc			51.3	0.340			25.7	1.688		
magealle	25.7	0.025	51.3	0.020			38.5	0.195		
magejohn			12.8	0.002	77.0	0.034	38.5	0.036	641.5	0.847
magemira			128.3	0.017	410.6	0.181	64.2	0.059	89.8	0.119
malmmlunu							12.8	0.049	12.8	0.030
medifrag	12.8	0.012								
nephcaec							25.7	0.496		
nephcirr							141.1	0.283	128.3	0.190
nephhomb	38.5	0.562	38.5	0.180	12.8	0.036				
nephspec	12.8	0.012								
nerelong							12.8	0.073		
ophiflex					25.7	0.195				
orbisert	12.8	0.012								
owenfusi			12.8	0.014			12.8	0.010		
pectauri	25.7	0.025	12.8	0.005						
pholminu	115.5	0.117	38.5	0.015			12.8	0.010		
phylinde					25.7	0.007				
poecserp									51.3	0.113

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scolarmi	25.7	0.025	38.5	0.193	38.5	0.071	12.8	0.010	51.3	0.122
scolbonn					12.8	0.112	12.8	0.080		
sigamath					51.3	0.169			38.5	0.081
spiobomb			102.6	0.041	320.8	0.356	218.1	0.161	38.5	0.091
spiofili					12.8	0.003			38.5	0.091
sthelimi			12.8	0.076	12.8	0.003				
syneklat	25.7	0.025								
Miscellaneous taxa										
edwaclap	12.8	0.059								
nemertin	12.8	0.008	25.7	0.068	12.8	0.020	38.5	0.237	77.0	0.861
turbella	12.8	0.003								
oligocha	12.8	0.012								
phoronid	205.3	0.054	2078.5	0.549	218.1	0.058	256.6	0.068	372.1	0.049
sum	3733.5	24.0	3143.4	3.7	2142.6	5.4	1873.2	6.4	1860.4	6.6
nspc	30		33		37		38		22	
SH-W	1.66		1.67		2.89		3.13		2.31	
Simp	0.43		0.44		0.09		0.06		0.17	

station	OFF2		OFF3		OFF4		OFF5		OFF6	
Crustacea	n	b	n	b	n	b	n	b	n	b
acidobes							12.8	0.004		
batheleg	38.5	0.012	12.8	0.004	25.7	0.008	12.8	0.004	12.8	0.004
bathguil	25.7	0.008	12.8	0.004	12.8	0.004				
calljuve							12.8	0.021		
callspec			12.8	0.046						
callsubt					12.8	1.821				
diasbrad					12.8	0.004				
ebalcran					12.8	0.741				
harpante							12.8	0.004		
leucinci					25.7	0.008			25.7	0.008
orchnana			12.8	0.004			12.8	0.004		
perilong	12.8	0.004			25.7	0.008				
phthmari			25.7	0.008	25.7	0.008				
pseulong	12.8	0.004	25.7	0.008	25.7	0.008	12.8	0.004	38.5	0.012
siphkroy					51.3	0.015				
syncmacu							12.8	0.004		
thiascut									38.5	1.678
urotbrev	51.3	0.015					25.7	0.008		
urotpose	269.4	0.081			12.8	0.004	64.2	0.019	38.5	0.012
Echinodermata										
echicord	25.7	9.553	38.5	13.185	12.8	7.502	12.8	6.664		
echipusi							38.5	0.007	38.5	0.013
ophialbi			12.8	0.297	89.8	0.352				
ophitext			12.8	1.701						
ophispec	12.8	0.000							12.8	0.002
Mollusca										
corbgibb					12.8	0.096				
dosilupi									12.8	0.010
ensiamer									12.8	7.677
euspniti					38.5	0.122	51.3	0.289	38.5	0.056
goodtria									230.9	0.025
mysebide							25.7	0.002		
tellfabu	282.3	6.525	461.9	12.737	89.8	0.367	77.0	0.193		
tellferr	179.6	0.177	38.5	0.013	102.6	0.026	38.5	0.038		
tellpygm									12.8	0.019
Polychaeta										
capicapi			12.8	0.019						
chaeseto	51.3	0.024	38.5	0.054			38.5	0.025		

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eteolong	12.8	0.005								
eumisang	25.7	0.012	25.7	0.037						
gonimacu					12.8	0.005				
harmspec					12.8	0.005	12.8	0.008		
laniconc							102.6	3.473	51.3	7.049
magejohn	282.3	0.415	449.1	0.616	38.5	0.036	12.8	0.008		
magemira			115.5	0.159	38.5	0.036	12.8	0.008		
malmlunu							12.8	0.108	12.8	0.027
nephassi							12.8	0.574		
nephcirr	12.8	0.020	12.8	0.019	51.3	0.020			25.7	0.066
nephhomb	25.7	1.888					12.8	0.091	25.7	0.530
nerelong									12.8	0.010
notolate					12.8	0.998				
pectkore							12.8	1.042		
pholminu							12.8	0.008		
poecserp	25.7	0.012	38.5	0.054						
scolarmi	38.5	0.017	115.5	0.169	12.8	0.005				
scolbonn	12.8	0.063	12.8	0.019					12.8	0.112
sigamath	25.7	0.779	12.8	0.518	51.3	0.979	64.2	1.782		
spiobomb	25.7	0.224	12.8	0.019			64.2	0.176	25.7	0.002
spiofili	12.8	0.005	25.7	0.037						
streweds									12.8	0.002
Miscellaneous taxa										
anthozoa							12.8	2.978		
nemertin	12.8	0.031	12.8	0.059	64.2	0.206	12.8	0.020	25.7	0.192
nematoda									51.3	0.003
phoronid			25.7	0.007	269.4	0.178	25.7	0.007	987.9	0.130
sum	1475.5	19.9	1578.1	29.8	1154.7	13.6	846.8	17.6	1757.7	17.6
nspc	23		25		27		30		23	
SH-W	2.45		2.27		2.84		3.11		1.85	
Simp	0.12		0.18		0.08		0.04		0.33	

station	OFF7		OFF8		OFF9		OFF10		OFF11	
Crustacea	n	b	n	b	n	b	n	b	n	b
batheleg			141.1	0.042	795.5	0.239	38.5	0.012	230.9	0.069
bathguil			102.6	0.031	128.3	0.038	25.7	0.008	38.5	0.012
bathspec							12.8	0.004		
diasbrad			12.8	0.004	12.8	0.004				
endespin									12.8	0.004
iphitris	12.8	0.004								
leptspec					51.3	0.015				
leucinci			25.7	0.008					12.8	0.004
megaagil			25.7	0.008	12.8	0.004	25.7	0.008		
perilong					12.8	0.004				
pontalta							12.8	0.004	12.8	0.004
pseulong					38.5	0.012				
siphkroy									25.7	0.008
syncmacu					51.3	0.015				
thiascut	38.5	1.272								
urotbrev	115.5	0.035	38.5	0.012	77.0	0.023	38.5	0.012		
urotpose	333.6	0.100	923.8	0.277	77.0	0.023	25.7	0.008		
Echinodermata										
echicord	89.8	43.221	12.8	11.986			38.5	27.960		
echipusi									141.1	0.005
ophialbi	25.7	0.006	25.7	0.314						
ophispec					12.8	0.000	25.7	0.000		
Mollusca										
donavitt			12.8	0.013	77.0	1.256	89.8	6.905	12.8	0.000

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euspniti	12.8	0.109	25.7	0.070	12.8	0.002	25.7	0.042	25.7	0.073
goodtria	12.8	0.001								
mysebide			51.3	0.020						
nucuniti									12.8	0.064
tellfabu	38.5	0.001	141.1	2.838			12.8	0.011	38.5	0.001
tellferr	128.3	0.024	25.7	0.045			12.8	0.023		
Polychaeta										
aricminu					12.8	0.000	25.7	0.019		
chaeseto	12.8	0.020			12.8	0.022	12.8	0.010		
eteolong									12.8	0.025
exoghebe							12.8	0.010		
gonimacu			12.8	0.008					12.8	0.025
gyptcape									12.8	0.025
harmspec	25.7	0.003	12.8	0.008						
laniconc					12.8	0.000	77.0	9.643		
magejohn	25.7	0.049	115.5	0.164			77.0	0.257	77.0	0.180
magemira	51.3	0.100	51.3	0.073	89.8	0.144			12.8	0.030
mamlunu							12.8	0.003		
nephassi									12.8	0.845
nephcirr			38.5	0.190	89.8	0.540	77.0	1.004	12.8	0.025
notolate									12.8	1.741
ophelima							12.8	0.008		
scolarmi	51.3	0.388	51.3	0.180	102.6	0.474	89.8	0.601		
scolbonn			12.8	0.139						
sigamath			12.8	0.046						
spiobomb	38.5	0.005	12.8	0.005	256.6	0.001	38.5	0.008	64.2	0.127
spiokroe					12.8	0.037				
Miscellaneous taxa										
anthozoa					12.8	0.008				
nemertin	12.8	0.008	51.3	0.223	12.8	0.028	38.5	0.229		
phoronid			12.8	0.007	12.8	0.003				
sum	1026.4	45.3	1950.2	16.7	1988.7	2.9	859.6	46.8	795.5	3.3
nspc	17		25		24		24		20	
SH-W	2.30		2.18		2.27		2.95		2.41	
Simp	0.14		0.24		0.19		0.05		0.13	
station										
Crustacea										
batheleg	243.8	0.073	38.5	0.012			25.7	0.008	89.8	0.027
bathguil	12.8	0.004	25.7	0.008	12.8	0.004	12.8	0.004	25.7	0.008
diasbrad			12.8	0.004						
hippdent					12.8	0.004				
megaagil			12.8	0.004	25.7	0.008			51.3	0.015
metorubr			12.8	0.004						
pagubern			12.8	3.780						
pseulong	12.8	0.004			12.8	0.004	25.7	0.008		
siphkroy							12.8	0.004		
syncmacu			12.8	0.004	12.8	0.004	12.8	0.004		
thiascut	12.8	0.073								
urotbrev	25.7	0.008	12.8	0.004						
urotpose	38.5	0.012	64.2	0.019	25.7	0.008	38.5	0.012	64.2	0.019
Echinodermata										
echicord	25.7	0.210								
echipusi					25.7	0.000				
ophialbi					25.7	0.017				
ophispec							25.7	0.000	12.8	0.000
Mollusca										
donavitt	25.7	0.005	25.7	0.016	64.2	3.639	12.8	0.115	128.3	5.367
euspniti			12.8	0.004	12.8	0.004	12.8	0.015		
tellfabu	12.8	0.000			25.7	0.007				

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tellferr					12.8	0.002				
Polychaeta										
aricminu	38.5	0.010	38.5	0.007			64.2	0.014	12.8	0.007
chaeseto					25.7	0.005			12.8	0.007
eteofoli			12.8	0.032						
gonimacu			25.7	0.017	64.2	0.178				
magejohn	102.6	0.508	64.2	0.278	38.5	0.066	25.7	0.164		
magemira							12.8	0.081	12.8	0.007
nephcaec							12.8	4.297		
nephcirr	128.3	0.484	128.3	0.156	102.6	0.168	25.7	0.601	115.5	0.825
nephspec			12.8	0.002			12.8	0.003		
parafulg									38.5	0.022
scolarmi	128.3	0.684	51.3	0.335	141.1	0.510	64.2	0.217	38.5	0.117
scolbonn									12.8	0.486
spiobomb	51.3	0.105			38.5	0.132	51.3	0.132	89.8	0.049
spiofili	12.8	0.003								
Miscellaneous taxa										
nemertin					12.8	0.310				
branlanc							25.7	0.028		
sum	872.4	2.2	577.4	4.7	692.8	5.1	474.7	5.7	705.7	7.0
nspc	15		18		19		18		14	
SH-W	2.24		2.58		2.62		2.71		2.34	
Simp	0.13		0.08		0.08		0.05		0.10	

station	OFF17		OFF18		OFF19		OFF20		OFF21	
Crustacea	n	b	n	b	n	b	n	b	n	b
atylfalc					12.8	0.004				
megaagil	12.8	0.004			25.7	0.008	51.3	0.015		
pseulong			12.8	0.004						
urotpose					12.8	0.004				
Echinodermata										
echicord					12.8	9.737				
ophispec			12.8	0.000	25.7	0.001				
Mollusca										
goodtria									12.8	0.006
mactcora									51.3	0.007
tellpygm									25.7	0.005
Polychaeta										
aonipauc	25.7	0.010					12.8	0.003		
aricminu					25.7	0.007				
chaeseto	12.8	0.020								
glyclapi							12.8	0.039		
glycspec									12.8	0.002
magejohn	12.8	0.097								
nephcirr	12.8	0.041	25.7	0.293	64.2	0.762	25.7	0.286	12.8	0.425
nephhomb					12.8	0.200				
nephspec					12.8	0.003				
parafulg	51.3	0.020	64.2	0.034						
scolarmi					12.8	0.017				
scolfoli									12.8	0.090
scolsqua			102.6	2.774						
spiobomb			12.8	0.007	38.5	0.051				
spiofili							12.8	0.003		
syllidae									12.8	0.002
Miscellaneous taxa										
nemertin							12.8	0.062		
nematoda									12.8	0.003
sum	128.3	0.2	230.9	3.1	256.6	10.8	128.3	0.4	154.0	0.5
nspc	6		6		11		6		8	

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SH-W	1.61		1.44		2.22		1.61		1.91	
Simp	0.16		0.25		0.08		0.16		0.11	

station	OFF22		OFF23		OFF24		OFF25		OFF26	
Crustacea	n	b	n	b	n	b	n	b	n	b
batheleg	12.8	0.004	25.7	0.008						
calttyr			64.2	0.312						
leucinci			25.7	0.008			12.8	0.004		
megaagil	25.7	0.008					12.8	0.004		
perilong			12.8	0.004						
procnoho							12.8	0.148		
pseulong					12.8	0.004	12.8	0.004		
syncmacu							12.8	0.004		
thiascut			12.8	1.051					25.7	2.844
urotbrev	12.8	0.004	38.5	0.012	51.3	0.015				
urotpose	102.6	0.031	256.6	0.077	128.3	0.038	12.8	0.004		
Echinodermata										
echicord	12.8	7.797					12.8	5.185		
Mollusca										
ensiamer	12.8	5.104	12.8	18.508						
euspniti	38.5	0.008	38.5	0.077	38.5	0.008	25.7	0.019		
Polychaeta										
aricminu	38.5	0.029								
eteolong	25.7	0.019			12.8	0.015	25.7	0.007		
eumisang							12.8	0.003		
euzoflab									12.8	0.005
exoghebe							12.8	0.003		
glyclapi					12.8	0.063	12.8	0.124		
nephcaec					12.8	5.819				
nephcirr	25.7	0.200	38.5	0.669	51.3	0.964	51.3	0.984	38.5	0.505
nephhomb	12.8	0.019			12.8	0.024				
nephspec							38.5	0.008		
ophelima									12.8	0.005
poecserp			89.8	0.103	25.7	0.030				
scolami	25.7	0.019	77.0	1.350	51.3	0.320				
scolbonn	12.8	0.225	25.7	0.246	38.5	0.442	12.8	0.159		
spiobomb	25.7	0.019	38.5	0.054	25.7	0.030	12.8	0.003		
spiokroe					12.8	0.015				
spiofili			12.8	0.010			12.8	0.003		
Miscellaneous taxa										
nemertin			77.0	0.000			12.8	0.051		
nematoda							12.8	0.003		
phoronid	102.6	0.020	295.1	0.078					12.8	0.003
sum	487.5	13.5	1141.9	22.6	487.5	7.8	333.6	6.7	102.6	3.4
nspc	15		17		14		19		5	
SH-W	2.41		2.33		2.35		2.81		1.49	
Simp	0.10		0.13		0.10		0.03		0.14	

station	OFF27		OFF28		OFF29		OFF30		OFF31	
Crustacea	n	b	n	b	n	b	n	b	n	b
batheleg									564.5	0.169
bathguil					12.8	0.004			51.3	0.015
calttyr					12.8	0.050				
megaagil									38.5	0.012
orchnana					12.8	0.004				
phthmari					38.5	0.012				
procpav	12.8	0.177								

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pseulong							12.8	0.004	51.3	0.015
syncmacu									12.8	0.004
thiascut					12.8	1.651				
urotpose	12.8	0.004					513.2	0.154	12.8	0.004
Echinodermata										
echicord					12.8	12.808	12.8	0.104		
echipusi			12.8	0.001	89.8	0.054				
holoinde							12.8	0.232		
ophialbi					25.7	0.385				
ophispec									12.8	0.000
Mollusca										
abraalba					12.8	0.000				
donavitt									38.5	1.615
euspnti			12.8	0.002						
spissubt			12.8	0.999						
tellfabu							179.6	1.553	38.5	0.002
tellferr					12.8	0.002	89.8	0.023		
tellpygm			51.3	0.083	12.8	0.006				
thrappas					25.7	0.002				
Polychaeta										
aricminu									38.5	0.010
chaeseto							38.5	0.005	25.7	0.007
eteolong							12.8	0.002	12.8	0.003
euzoflab			25.7	0.007						
glycspec			12.8	0.003						
gonimacu					12.8	0.091			38.5	0.290
harmspec									12.8	0.003
magejohn					12.8	0.027	141.1	0.317	12.8	0.049
magemira							77.0	0.173	12.8	0.049
nephcirr			154.0	0.520	64.2	0.251	89.8	0.144	25.7	0.269
nephspec									25.7	0.007
ophelima					12.8	0.002				
parafulg					38.5	0.005				
polyinde	12.8	0.003								
scolarmi							12.8	0.032	141.1	0.334
sigamath							12.8	0.091		
spiobomb					51.3	0.071	12.8	0.002		
spiofili							12.8	0.002		
travforb					12.8	0.327				
Miscellaneous taxa										
anthozoa							12.8	0.931		
nemertin					38.5	0.113	25.7	0.054	12.8	0.085
nematoda					25.7	0.003				
phoronid	51.3	0.010					25.7	0.005		
sum	89.8	0.2	282.3	1.6	551.7	15.9	1295.8	3.8	1180.4	2.9
nspc	4		7		21		18		20	
SH-W	1.15		1.42		2.80		2.09		2.08	
Simp	0.29		0.32		0.05		0.20		0.25	

station	OFF32		OFF33		OFF34		OFF35		OFF36	
Crustacea	n	b	n	b	n	b	n	b	n	b
batheleg	12.8	0.004	128.3	0.038	25.7	0.008				
bathguil			12.8	0.004						
callyrr			12.8	0.013						
diasbrad			12.8	0.004						
hippdent					12.8	0.004				
leucinci			12.8	0.004						
megaagil			25.7	0.008	64.2	0.019				

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perilong					12.8	0.004				
pseulong			12.8	0.004	25.7	0.008				
siphkroy					12.8	0.004				
syncmacu			12.8	0.004						
thiascut			12.8	0.762						
urotbrev	12.8	0.004	38.5	0.012	12.8	0.004				
urotpose	12.8	0.004	64.2	0.019	154.0	0.046			12.8	0.004
Echinodermata										
echicord	12.8	3.587	12.8	13.669	12.8	11.986				
echipusi			25.7	0.046						
ophialbi			12.8	0.348					38.5	0.007
ophispec					38.5	0.001				
Mollusca										
donavitt					51.3	3.403				
euspniti			51.3	0.010	38.5	0.050			77.0	0.042
tellfabu					12.8	0.019				
tellferr			12.8	0.001	38.5	0.043				
Polychaeta										
aricminu			12.8	0.002	51.3	0.017				
chaeseto			51.3	0.039						
eteolong			12.8	0.002						
euzoflab							51.3	0.027		
exoghebe			320.8	0.019						
glycspec							25.7	0.014		
gonimacu					12.8	0.095				
hetefili			243.8	0.030						
laniconc			12.8	0.002					12.8	0.003
nephcirr	12.8	0.476	141.1	0.369	89.8	0.359	51.3	0.169	64.2	0.444
nephhomb			12.8	0.364					12.8	0.481
nephspec			12.8	0.002	38.5	0.014	51.3	0.027		
nerelong			12.8	0.857						
ophelima			25.7	0.003			12.8	0.007	12.8	0.003
parafulg	12.8	0.010			12.8	0.005				
pholminu			51.3	0.007						
phylgroe					12.8	0.251				
poecserp			12.8	0.046						
scolarmi			89.8	0.234	25.7	0.266				
spiobomb			295.1	0.039	102.6	0.107	12.8	0.007		
spiofili			12.8	0.002			12.8	0.007		
syllidae			25.7	0.003						
travforb			12.8	0.002			51.3	0.027		
Miscellaneous taxa										
anthozoa			12.8	0.017						
nemertin			25.7	0.271	12.8	0.011				
oligocha			25.7	0.003						
phoronid			372.1	0.098	12.8	0.003				
sum	77.0	4.1	2258.1	17.4	885.3	16.7	269.4	0.3	230.9	1.0
nspc	6		38		24		8		7	
SH-W	1.79		2.87		2.83		1.92		1.66	
Simp	0.00		0.08		0.06		0.12		0.18	

station	COA 1		COA2		COA3		COA4		COA5	
Crustacea	n	b	n	b	n	b	n	b	n	b
atylswam							25.7	0.008	25.7	0.008
bathelleg	38.5	0.012	12.8	0.004	12.8	0.004				
bathguil	12.8	0.004								
diasbrad									12.8	0.004
liocspec									12.8	0.011

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pseulong	12.8	0.004					38.5	0.012		
urotbrev	12.8	0.004	25.7	0.008			12.8	0.004	154.0	0.046
urotpose	102.6	0.031	154.0	0.046	192.5	0.058	192.5	0.058	3874.7	1.162
Echinodermata										
asterube									12.8	2.290
echicord					12.8	0.385				
holoinde					12.8	0.422				
ophitext					25.7	2.878				
ophispec									12.8	0.000
Mollusca										
abraalba									38.5	0.169
donavitt							12.8	0.009		
ensiamer			1590.9	345.773	77.0	67.456	38.5	70.906	1744.9	299.476
euspniti					12.8	0.481			12.8	0.015
macobalt	12.8	0.012	154.0	2.837						
mysebide	12.8	0.014			692.8	0.207	12.8	0.001	38.5	0.006
spissubt	38.5	0.059	64.2	5.705	590.2	32.229	218.1	8.720		
tellfabu	102.6	3.562	12.8	0.000	115.5	2.678	89.8	2.476	115.5	1.743
tellferr									12.8	0.004
Polychaeta										
capicapi									230.9	0.122
chaeseto	12.8	0.019								
eteolong									12.8	0.007
eumisang							12.8	0.012	77.0	0.041
laniconc							2668.6	0.506	5016.5	64.398
magejohn	282.3	0.410					12.8	0.012	25.7	0.014
magemira	25.7	0.037								
malmilunu									590.2	0.716
nephcaec	51.3	2.703								
nephcirr			12.8	0.014	64.2	0.102				
nephhomb			12.8	0.135	51.3	0.693	128.3	1.504	115.5	2.185
nephlong	12.8	0.019							12.8	0.098
nephspec	12.8	0.019			12.8	0.008				
nerelong					51.3	1.204			25.7	3.416
notolate					12.8	0.166				
owenfusi					38.5	0.124				
pectkore							12.8	0.012		
phyllami									243.8	0.540
phylose					12.8	0.008				
scolami	25.7	0.037								
sigamath					12.8	0.083			38.5	0.283
spiobomb	25.7	0.037			295.1	0.176	64.2	0.063	1757.7	3.004
spiofili			12.8	0.014			25.7	0.025	12.8	0.007
Miscellaneous taxa										
anthozoa					12.8	10.760				
nemertin							25.7	0.373	12.8	0.169
phoronid					102.6	0.017				
sum	795.5	7.0	2052.8	354.5	2412.0	120.1	3592.4	84.7	14241.3	379.9
nspc	17		10		21		17		27	
SH-W	2.23		0.91		2.18		1.15		1.81	
Simp	0.16		0.61		0.17		0.56		0.23	

station	COA6		COA7		COA8		COA9		COA10	
Crustacea	n	b	n	b	n	b	n	b	n	b
atylswam	38.5	0.012								
bathelleg			77.0	0.023			12.8	0.004		
bathguil							12.8	0.004		
calltyrr							12.8	0.004		

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diasbrad	12.8	0.004							12.8	0.004
megaagil							12.8	0.004		
pseulong	38.5	0.012								
syncmacu			12.8	0.004			12.8	0.004		
urotbrev	64.2	0.019			25.7	0.008	205.3	0.062	12.8	0.004
urotpose	859.6	0.258	12.8	0.004	320.8	0.096	1167.5	0.350		
Echinodermata										
echicord	38.5	22.011							12.8	0.972
Mollusca										
chamstri							12.8	3.253		
donavitt					12.8	2.953				
ensiamer	12.8	29.276			1308.7	749.652				
euspniti							12.8	0.481		
macobalt	141.1	1.192	38.5	0.025						
mysebide	38.5	0.022							38.5	0.013
spissubt	25.7	2.354			12.8	0.031	256.6	14.343		
tellfabu	25.7	0.036			12.8	0.054	64.2	2.680	12.8	0.537
tellferr	166.8	0.115							64.2	0.024
telltenu					25.7	0.694	243.8	0.026	25.7	0.950
venesene							12.8	1.060		
Polychaeta										
capicapi					51.3	0.139	51.3	0.061	25.7	0.008
chaeseto							25.7	0.032		
harmspec					12.8	0.007				
laniconc	25.7	0.887			166.8	8.326				
magejohn	12.8	0.015	115.5	0.450	25.7	0.069			89.8	0.322
magemira	25.7	0.063	128.3	0.501					12.8	0.046
mamlunu					38.5	0.095				
nephcaec	12.8	0.085								
nephcirr			51.3	0.334			12.8	0.005	115.5	0.706
nephhomb	51.3	0.684	12.8	0.251	25.7	0.440	38.5	0.078	51.3	0.237
nephspec			12.8	0.002						
nerelong							12.8	0.432		
notolate							12.8	0.310		
owenfusi							12.8	0.025		
pectkore							25.7	2.469		
phyllami							25.7	0.083		
phylose							12.8	0.007		
poecserp							51.3	0.064		
scolarmi			12.8	0.173			192.5	1.060	25.7	0.046
scolbonn							12.8	0.080	12.8	0.093
spiobomb	25.7	0.030			77.0	0.208	102.6	0.129	25.7	0.008
spiofili	38.5	0.046					12.8	0.017		
sthenboa							12.8	1.528		
Miscellaneous taxa										
nemertin							89.8	0.598	25.7	0.367
phoronid							12.8	0.005	12.8	0.003
branlanc			12.8	0.008						
sum	1655.1	57.1	487.5	1.8	2117.0	762.8	2758.5	29.3	577.4	4.3
nspe	19		11		14		31		17	
SH-W	1.93		2.00		1.40		2.26		2.54	
Simp	0.29		0.15		0.41		0.21		0.08	

station	COA11		COA12		COA13		COA14		COA15	
Crustacea	n	b	n	b	n	b	n	b	n	b
leucinci	12.8	0.004							12.8	0.004
liocmarm	12.8	1.126								
phthmari							25.7	0.008		

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siphkroy					12.8	0.004				
syncmacu					12.8	0.004				
urotbrev							38.5	0.012	102.6	0.031
urotpose	12.8	0.004					166.8	0.050	975.1	0.293
Echinodermata										
echicord									12.8	1.467
ophitext							64.2	1.372	12.8	0.769
Mollusca										
ensiamer	154.0	125.292	25.7	43.511					115.5	70.881
mysebide									12.8	0.003
spissubt			12.8	0.031						
tellfabu							256.6	3.844	141.1	4.014
Polychaeta										
capicapi							12.8	0.002	154.0	0.047
eteolong			38.5	0.030					12.8	0.003
eumisang									128.3	0.081
laniconc							51.3	0.791	256.6	8.525
magejohn			25.7	0.195			12.8	0.002	205.3	0.254
magemira							12.8	0.002	25.7	0.032
malmlunu							12.8	0.020	115.5	0.166
nephassi									12.8	1.126
nephcaec	12.8	11.990								
nephcirr	77.0	0.298	115.5	0.754					102.6	0.129
nephhomb					12.8	0.054	77.0	1.485	102.6	0.290
nephspec							12.8	0.002		
nerelong									12.8	1.799
notolate							64.2	2.579	51.3	2.176
owenfusi									256.6	0.862
pectkore									12.8	0.781
phylgroe			12.8	0.510						
poecserp									12.8	0.039
scolarmi	12.8	0.156	102.6	1.714						
scolbonn					38.5	0.022				
sigamath									12.8	0.003
spiobomb	38.5	0.103	77.0	0.061			744.1	0.574	692.8	0.352
spiofili							333.6	0.053	12.8	0.003
sthelimi									12.8	0.261
Miscellaneous taxa										
anthozoa									12.8	39.189
nemertin	12.8	0.042					12.8	0.008	38.5	0.706
phoronid									12.8	0.003
sum	346.4	139.0	410.6	46.8	77.0	0.1	1898.8	10.8	3643.7	134.3
nspc	9		8		4		16		30	
SH-W	1.67		1.80		1.24		1.95		2.52	
Simp	0.24		0.17		0.20		0.21		0.13	

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