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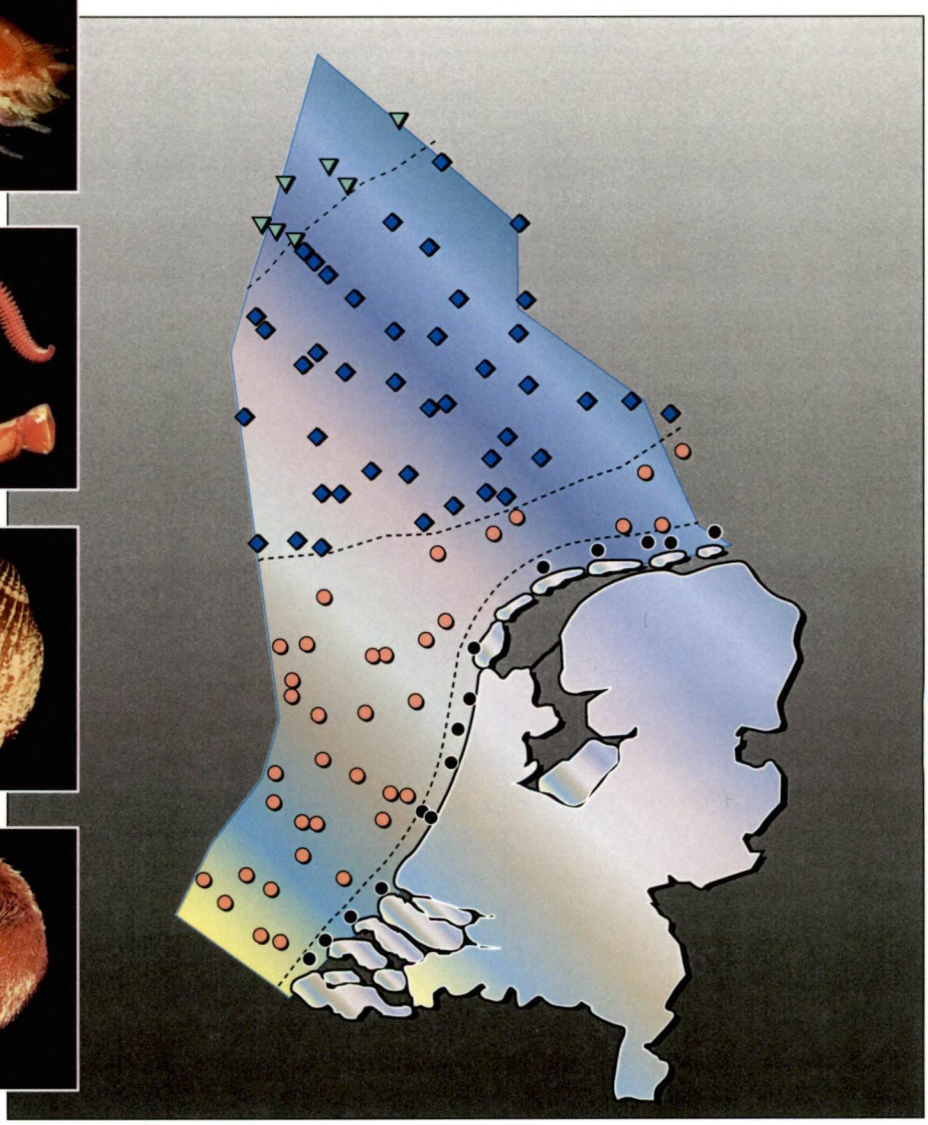

Koninklijk Nederlands Instituut voor Onderzoek der Zee

Monitoring Macrozoobenthos of the North Sea

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THE MACROBENTHIC FAUNA IN THE DUTCH SECTOR OF THE NORTH SEA IN 2002 AND A COMPARISON WITH PREVIOUS DATA

R. DAAN AND M. MULDER

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)

ROYAL NETHERLANDS INSTITUTE FOR SEA RESEARCH
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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 spring 2002. 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 2002 the 100 BIOMON stations were sampled in the period between March 11 and April 11. On the basis of the results collected in 2002 and previous years an analysis is made of the trends and fluctuations of some selected species and of basic community attributes over the period 1986-2002. The community attributes studied were the diversity, abundance and biomass of the total macrofauna and of the 4 major taxonomic groups. 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. The sediment composition in the four subareas was generally quite similar to that found in previous years. However there were a few exceptions. At station OFF 6, west of Texel, where a strong decline in the median grain size had been observed in 2001, this median grain size was back at its usual level in 2002. This indicates that, if any human activity had been responsible for the sediment change in 2001, recovery has taken place within one year. Further there are a few stations along the southern edge of the Frisian Front area that show high temporal variation in silt contents. Possibly the sediments are unstable here since depth may be critical here with respect to the effects of turbulence in bottom water on sediment composition. However, there is also one station in the deepest part of the Oyster Ground (>50m) where silt concentrations appear to be highly variable. Since sediments are expected to be stable here it is suggested that this variability is caused by local spatial differences in sediment composition rather than by temporal changes.
2. At the community level, there were a few changes compared to preceding years. At the Dogger Bank a slight decrease could be observed in diversity based on the Shannon Wiener Index. Further there was a rather strong decline in biomass, largely caused by the disappearance of large sea urchins (*Ecinocardium cordatum*). Although usually only a few are found in the samples, these large specimens largely determine

the total biomass. In the Oyster Ground a slight but continuous increase could be observed in species richness (number of species per sample) and in biomass from 1996 onwards

3. At the Dogger Bank the sand star *Acrocnida brachiata*, the bivalve *Mysella bidentata* and the polychaete *Aricidea minuta*, three species that had shown a decline in preceding years occurred still in low numbers in 2002. A slight sign of recovery was observed in the polychaete *Nephtys cirrosa*. New to the Dogger Bank is the occurrence of the gastropod *Scaphander lignarius* and the bivalve *Gari costulata*. Within the DCS both species have been recorded only once. Both records are from the Oyster Ground.
4. In the Oyster Ground the recovery of the populations of the brittle *star Amphiura filiformis*, first observed in 2001, continued in 2002. Further the *bivalve Nucula nitidosa*, which had shown an increase in abundance since 1999, further increased to densities higher than ever within the BIOMON program. There were four species that have not been found before. The isopod *Bopyrus squillarum*, the amphipod *Dyopedos monacanthus* and the gastropods *Mangelia nebulosa* and *Scaphander lignarius* are new to the Oyster Ground. Some of them have been found during other research projects, but not within BIOMON. A few other species that had been found in 2000 or 2001 for the first time reoccurred in the samples in 2002.
5. In the Offshore area the sea urchin (*Echinocardium cordatum*) shows a slightly increasing trend from 1995 onwards, which continued in 2002, particularly in terms of biomass. The presence of relatively much large sea urchins was a major cause of the relatively high biomass values in the area in 2002. Recovery of populations of the gastropod *Euspira nitida* started in 2000 and continued in 2002. Three species are new within the BIOMON program. The polychaetes *Lagisca extenuata* and *Syllis gracilis* are probably new to the Dutch fauna. The bivalve *Striarca lactea* has been recorded from a few stations in other research programs.
6. In the Coastal area there seemed to be a tendency for an increase in the abundance of the amphipod *Urothoe poseidonis* and in the biomass of the sea urchin *Echinocardium cordatum*. The presence of large *E. cordatum* and/or the presence of banks of *Spisula subtruncata* or *Ensis americanus* were the cause of extremely high biomass values at a few stations. The polychaete *Nephtys assimilis*, a new species in 2001, was present now at 3 stations in the Coastal area. It seems that this species recently has colonized the whole DCS and that it has been successful in building up new populations.

2. SAMENVATTING

In dit rapport worden de resultaten gepresenteerd van een macrobenthos bemonstering die in 2002 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 anthropogene activiteiten (bijv. eutrofiëring, verontreiniging, boomkorvisserij).

In het kader van dit project wordt jaarlijks veldonderzoek uitgevoerd in het voorjaar. In 2002 zijn de 100 BIOMON stations tussen 11 maart en 11 april bemonsterd. Aan de hand van de gegevens die in 2002 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 - 2002. Deze set kenmerken bestaat uit de diversiteit, de dichtheid en biomassa van de totale fauna en de 4 belangrijkste taxa. 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. De sedimentsamenstelling in de vier subgebieden leek in het algemeen veel op die in vorige jaren. Op de afzonderlijke stations waren er enkele uitzonderingen op deze regel. Op station Off 6, ten westen van Texel, waar in 2001 een sterke afname in de mediane korrelgrootte werd geconstateerd, was deze mediane korrelgrootte in 2002 weer terug op het vroegere niveau. Dit wijst erop dat, als de verandering in sedimentsamenstelling veroorzaakt was door een of andere menselijke aktiviteit, herstel binnen een jaar heeft plaatsgevonden. Verder waren er enkele stations aan de zuidrand van het Friese Front gebied die van jaar op jaar grote variatie in slibgehalte vertoonden. Mogelijk zijn de sedimenten hier instabiel omdat de diepte hier kritisch is met betrekking tot de effekten die turbulentie in het bodemwater kunnen hebben op de sedimentsamenstelling. Er is echter ook een station in het diepste deel van de Oestergronden (>50m) waar de slibconcentraties zeer variabel blijken te zijn Aangezien de sedimenten hier vermoedelijk wel stabiel zijn, is de variatie eerder te verklaren uit lokale ruimtelijke verschillen dan uit veranderingen in de loop van de tijd.

2. Op community niveau waren er enkele kleine veranderingen ten opzichte van de voorgaande jaren. Op de Doggersbank werd op basis van de Shannon Wiener Index een lichte afname gevonden in diversiteit. Verder was er een sterke afname in biomassa, met name door het ontbreken van grote hartegels (*Echinocardium cordatum*). Hoewel er gewoonlijk maar een paar worden gevonden in de monsters, maken deze grote exemplaren vaak het overgrote deel van de biomassa uit. In de Oestergronden werd vanaf 1996 een lichte maar continue stijging waargenomen in soortenrijkdom (aantal soorten per monster) en in biomassa.
3. Op de Doggersbank kwamen 3 soorten, die in voorgaande jaren een achteruitgang hadden doorgemaakt, nog steeds in lage dichtheden voor. Het gaat hier om de slangster *Acrocnida brachiata*, de bivalve *Mysella bidentata* en de de polychaet *Aricidea minuta*. Een licht teken van herstel was er bij de polychaet Nephtys cirrosa. Nieuw voor de Doggersbank zijn de gastropode *Scaphander lignarius* en de *bivalve Gari costulata*. Voor het NCP konden we voor beide soorten maar een eerdere melding vinden. Beide zijn eenmaal aangetroffen in de Oestergronden.
4. In de Oestergronden zette het herstel van de slangster *Amphiura filiformis*, dat zich in 2001 had aangediend, zich in 2002 voort. De bivalve *Nucula nitidosa*, die vanaf 1999 in aantal is toegenomen, nam verder toe tot dichtheden die in het BIOMON programma nog niet eerder zijn waargenomen. Vier soorten werden nog niet eerder gevonden. De isopode *Bopyrus squillarum*, de amphipode *Dyopedos nonacanthus* en de gastropoden *Mangelia nebulosa* en *Scaphander lignarius* zijn nieuw voor de Oestergronden. Sommige zijn wel eens tijdens een ander projekt gevonden, maar nooit binnen het BIOMON-programma. Sommige soorten die in 2000 of 2001 voor het eerst werden aangetroffen kwamen opnieuw in de monsters voor.
5. In het Offshore gebied laat de hartegel (*Echinocardium cordatum*) vanaf 1995 een licht toenemende trend zien, met name wat betreft biomassa. Deze trend zette zich voort in 2002. De aanwezigheid van relatief veel grote hartegels was er de oorzaak van dat het gemiddelde biomassagetal hoog was voor het Offshore gebied. Herstel van populaties van de gastropode *Euspira nitida* deed zich voor vanaf 2000 en zette zich voort in 2002. Drie soorten zijn nieuw binnen het BIOMON programma. De polychaeten *Lagisca extenuata* en *Syllis gracilis* zijn vermoedelijk nieuw voor de Nederlandse fauna. De bivalve *Striarca lactea* is eerder al wel op enkele stations binnen andere onderzoeksprogramma's gevonden.
6. In de kustzone was er een tendens van toename in de aantallen van de amphipode *Urothoe poseidonis* en in de biomassa van de hartegel *Echinocardium cordatum*. De aanwezigheid van grote hartegels en/of de aanwezigheid van banken van *Spisula subtruncata* of *Ensis americanus* was de oorzaak van extreem hoge biomassagetallen

op enkele stations. De polychaet *Nephtys assimilis*, in 2001 nog een nieuwe soort, was nu aanwezig op 3 stations in de kustzone. Het lijkt erop dat deze soort recent het gehele NCP met succes heeft gekoloniseerd.

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 2002. Further the results of the 2002 survey are compared with the BIOMON data collected in previous years (1991-2002) 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, 2002) 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 2002.

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 2002 the BIOMON stations were sampled in the period March 11 to April 11. Most stations have a water depth >5 m and were visited with the RV Mitra 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 delta 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 2002 can be found in the cruise report of Rijkswaterstaat (Anonymous, 2002).

4.2. Sample treatments

At each station two boxcore samples (0.078 m^2, 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 ∅, 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 (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, other worms, larger crustaceans and ophiuroids*:

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.

- *Remaining taxa*:

  Directly, by drying a sample at 60 °C for at least 60 hours and subsequently incinerating at 520 °C for 2 hours (Duineveld & Witte, 1987).

Small molluscs, 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

($Hill_0$) 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 Simpsons index means low diversity, whereas a high value for the $Hill_0$ 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 µm. 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 μm	Very fine sand
175 - 250 μm	Fine sand
250 - 300 μm	Medium-fine sand
300 - 350 μm	Medium-coarse sand
> 350 μm	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 2002 was quite similar to that in the preceding years. A look at the mean median grain size in the 4 subareas between 1995 and 2002 (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 2002 (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. There are, however, two exceptions. At station OFF 2, north of Schiermonnikoog, the median grain size was about 340 µm in 1997 and 1999, but substantially lower, about 210 µm, in the other years. In previous reports we already suggested that OFF 2 is situated at a sharp local gradient where the sediment changes from fine sand into medium-coarse sand within a short distance. As a consequence, small year to year differences in sampling position could result in rather strong differences in sediment composition. In 2002 the median grain size was 206 µm, which is within the range of values found in most of the preceding years. At station OFF 6, west of Texel, a steep decline in the median grain size was observed in 2001. Here the values had dropped from 280 – 320 µm in the period 1996 – 2000 to 200 µm in 2001. It has been suggested that a local physical disturbance, possibly by human activities, could have occurred at this station, leading to a selective disappearance of the larger size fractions in the sediment. In 2002 the median grain size at OFF 6 was 310 µm, so back at the level of preceding years. This could indicate that relocation of sediments by bottom currents has lead to recovery of the natural sediment composition within one year.

The distribution of silt in the sediment also showed the same spatial pattern as in the preceding years (Fig. 3). In 2001 there was one station where a substantial difference was found in the silt content compared to 1999 and 2000. This was station OYS 8, at the southern edge of the Frisian Front. The silt content at this station had dropped from 22 and 28 % in the preceding years to less than 9 % in 2001. In 2002 we found an intermediate value of 17%. The station is located in an area with a sharp north-south gradient in silt concentrations which is linked up with a relatively steep depth gradient. This means that a small difference in positioning possibly could have a strong effect on the silt content measured. Moreover, silt contents may be unstable at this station, since the

depth is between 30 and 40 m and therefore critical with respect to sedimentation and resuspension of silt. In 2002 there were 3 Oyster Ground stations that showed silt concentrations that were substantially lower than in 2001. These stations were OYS 11, 20 and 24, and showed declines from 38 to 15 %, 18 to 7 % and 34 to 8 % respectively. However, the silt contents found in 2002 were not extremely low when compared to the values found in the period before 2001 (see the text table below).

Text table: Silt contents (%) at 3 stations in the Oyster Ground.

	silt fraction 0 – 63 µm							
year	1995	1996	1997	1998	1999	2000	2001	2002
OYS 11	?	?	?	?	23.6	28.5	38.2	15.4
OYS 24	?	?	?	?	12.7	17.6	33.7	8.0
OYS 20	?	?	?	?	16.2	5.8	18.0	6.8
	silt fraction 16 - 63 µm							
year	1995	1996	1997	1998	1999	2000	2001	2002
OYS 11	14.8	15.3	25	22	9.5	18.0	27.0	6.4
OYS 24	4.0	4.9	2	7	6.0	8.7	26.7	2.5
OYS 20	1.8	5.7	7	0	9.1	0.0	9.2	0.9

Values for the total 0 – 63 µm fraction have been determined only in the most recent years, but values for the 16 – 63 µm fraction are available from 1995 onwards. At each of the 3 stations the silt concentrations appear to be highly variable. The fluctuations do not indicate a consistent temporal trend. Only for station OYS 11 the values were the lowest in 2002 for both silt fractions, but still of the same order as those found in 1999. At station OYS 24 the 0 – 63 µm fraction was the lowest in 2002, but also of the same order as in 1999. The 16 – 63 µm fraction was within the range of values found in previous years. At OYS 20 both fractions were within the range of values found in previous years.

The 3 stations mentioned are all located at the edge of the Oyster Ground area. OYS 11 and 24 lie near the southern edge of the area, close to the 30 m depth contour. In view of the limited depth it is conceivable that silt concentrations are unstable here, which could explain the high variability observed. Nevertheless, high spatial variability can not be excluded as an explaining factor. Station OYS 20 is situated near the western edge of the Oyster Ground , close to the Klaverbank. In this area relatively steep depth gradients do occur too. However, the water depth at OYS 20 is over 50 m and so deep enough to expect silt concentrations that are stable over time. We therefore assume that the strong year to year differences reflect local spatial variability, rather than temporal variability.

5.2. DISTRIBUTION OF THE MACROBENTHIC FAUNA IN 2002

5.2.1 Diversity, density and biomass

A total number of 207 species/taxa were identified in the 100 boxcore samples in 2002, including 3 that were identified to genus level only (most juveniles) and 9 higher taxa (identified to 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 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 there was a tendency for a slight increase in species richness from 1996 onwards. In the other subareas no clear long term trend could be observed in species richness. In the Offshore area there were four stations with a relatively rich fauna. The samples collected at OFF 1, 4, 5 and 33 all contained more than 30 species. These stations are exactly the same that showed a rich fauna in 2001 too. A look at the long term trend at these stations shows that species richness was generally low (10 to 20 species per box) before 1995. In 1995 peak values were found of about 30 species per box. Thereafter species richness was medium to low (15 to 25 species per box) up to 1999. From 2000 onwards there was a continuous increase to values beyond 30 species per box. This trend was more or less the same at each of the 4 stations.

The Shannon Wiener diversity was more or less the same at the Dogger Bank, the Oyster Ground and the Offshore area. For Simpson's dominance holds the same (Table 2, Fig. 9,10). Diversity had slightly decreased at the Dogger Bank compared to previous years, whereas it remained the same in the Oyster Ground and the Offshore area. Low Shannon Wiener diversity was found in the Coastal area whereas Simpson's dominance was high here. This means that the fauna in the samples was generally dominated by one or two abundant species. Species that were sometimes dominant in the samples are the crustacean *Urothoe poseidonis*, the polychaete *Spiophanes bombyx* and the molluscs *Ensis americanus, Mysella bidentata, Spisula subtruncata* and *Tellina fabula.*

The mean fauna density was as usual the lowest in the offshore area and the highest in the Oyster Ground (Table 2, Fig. 6,). At the Dogger Bank and in the Offshore area polychaetes were the most abundant group. In the Coastal area molluscs dominated. 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. There were no trendlike changes in fauna abundance (Fig. 11).

Biomass values at the Dogger Bank were clearly lower than in 2001 (Table 2, Fig. 12). Particularly the share of echinoderms and polychaetes had decreased. It is not clear what can have been the cause of the decrease, since in the Oyster Ground we saw a clear increase of the biomass compared to 2001 and in the Offshore and Coastal areas there was hardly any change. This indicates there can not be an effect of a (small) difference in the timing of sampling between both years. There does not seem to be a trendlike change, although in the Oyster Ground we can see a slight but continuous increase of biomass from 1997 onwards. The highest mean biomass, but also the strongest variation was found again in the coastal area (Fig. 7). As in previous years the peak values found at some stations in the coastal area were generally caused by dense populations of the mollusc *Spisula subtruncata* or by *Ensis americanus*.

With respect to the share of the different taxonomic groups to the total biomass there was no change in the Oyster Ground compared to the preceding year. Biomass of all major groups increased in this area. Also in the Offshore and Coastal areas there was no substantial change in the share of the different groups. The share of these groups remained more or less the same both in an absolute sense as in a relative sense. At the Dogger Bank the situation was different. Here mollusc biomass was, in an absolute sense, the same as in 2001, but since polychaete and echinoderm biomass decreased, the share of mollusc biomass increased considerably.

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 1986-2002.

<u>*Dogger Bank*</u> (Fig. 13a-c)
On the Dogger Bank there were a few species that showed a remarkable decrease in 2001. The sand star *Acrocnida brachiata*, the bivalve *Mysella bidentata* and the polychaetes *Nephtys cirrosa* and *Aricidea minuta* occurred in lower densities than ever in the nineties. Of these species *A. brachiata* and *M. bidentata* did still occur in low densities in 2002, whereas *A. Minuta* was still absent. A slight sign of recovery was only observed in *N. cirrosa*. The gastropod *Euspira nitida*, which had shown an increase from 1999 onwards remained stable in 2002.

In fig. 13b a graph is shown of the temporal development of a combination of 2 species, *Magelona mirabilis* and *M. johnstoni*, which showed stable densities in 2002. In

previous years we only distinguished *M. mirabilis*. However, recently it has become clear that in fact *M. mirabilis* comprises two morphologically similar species, *M. mirabilis* s.s. and *M. johnstoni* (Fiege *et al.*, 2000). For reasons of comparability with previous data we plotted here the density of the combination of the two species. A plot of *M. mirabilis* s.s. in sequel of the preceding development of *M. mirabilis* would erroneously suggest that the species had strongly declined in 2002, since *M. johnstoni* appeared to be 10 times as abundant as *M. mirabilis* s.s..

A species that is new to the Dogger Bank is the gastropod *Scaphander lignarius*. In the North Sea this species is usually found at higher latitudes. For the Dutch sector we found only one record: in 1986 one specimen has been found in the north western part of the Oyster Ground (de Wilde & Duineveld, 1988). Another species that is also new to the Dogger Bank is the bivalve *Gari costulata*. This species was on the DCS found for the first time in 2001, but then in the Oyster Ground (Daan & Mulder, 2002). In 2002 it was found at 3 stations at the Dogger Bank.

The number of species found at the Dogger Bank in 2002 (70) was well within the range of values found in previous years (66 – 87) . Also the total fauna density was similar tot that in previous years. Nevertheless, the total biomass appeared to be extremely low. A major cause is that in previous years always a few large sea urchins (*Echinocardium cordatum*) occurred in the samples. A few of those specimens usually account for the major part of the total biomass. In 2002 such large specimens were not found, which must have been a substantial cause of the decline in biomass.

<u>*Oyster Ground*</u> (Fig. 14a-c)

Most species in the Oyster Ground showed more or less stable densities compared to the preceding year or just a slight increase. This holds also for one of the most abundant species in the Oyster Ground, the brittle star *Amphiura filiformis*. Nevertheless, at the Frisian Front the densities of this species were still low compared to the numbers that were found here in the early nineties. The bivalve *Nucula nitidosa*, which had shown an increase in abundance since 1999, further increased in the Oyster Ground to densities that have not been found before.

There was one species that has not been found before during the BIOMON program and it is probably new to the Dutch fauna. It is the isopod *Bopyrus squillarum*, which lives as a parasite in the gills of shrimps of the genus *Palaemon* (Huwae, 1977). Although there are a few records of the species *Palaemon elegans* for the North Sea (Bergman et al., 1998), a host of this genus was not found in the sample. Possibly *B. squillarum* can also live on other crustacean species *like Callianassa subterranea* or

Upogebia deltaura, which were present in the sample. According to Huwae (1977) there is only one doubtful record of *B. squillarum* from the Dutch coast.

Three other species are new to the BIOMON program. The amphipod *Dyopedos monacanthus* has been found during the synoptic mapping in 1986 (de Wilde & Duineveld, 1988) and during the MILZON program in 1991 (Holtmann & Groenewold, 1992). Empty shells of the gastropod *Mangelia nebula* have been found several times before in the Oyster Ground, but this time a living individual was captured. Bergman et al. (1998) found this species in 1997 in a dredge haul at one station in the northern Oyster Ground Finally, like at the Dogger Bank, we found the gastropod *Scaphander lignarius* also at one station in the Oyster Ground. Together with the record of de Wilde & Duineveld (1988) there are 3 stations where the species has been found till now, all in the north western part of the DCS.

Finally there is a number of species that have been found in 2000 or 2001 for the first time and that reappeared in one or more samples in 2002. The gastropods *Retusa umbilicata* and *Ondina divisa*, new in 2000, were found at OYS 15 and OYS 36 respectively in 2002. The bivalves *Semierycina nitida* and *Tellimiya ferruginosa* that have been found in 2001 for the first time did occur on 5 and 3 stations respectively in 2002. The polychaete *Nephtys assimilis*, also a new species in 2001, was found at 3 stations in the Oyster Ground, but also at a number of stations in the Offshore and Coastal areas. The latter species was known only from the Loswal dumpsite west of the Hague (de Kluijver & van Nieuwenhoven, 1998). It seems that the species mentioned has colonized the DCS recently and that it has been successful in building up new populations.

Species richness was in the Oyster Ground, in terms of mean number of species per sample, higher than ever before during the BIOMON program, *i.e.* 33.5 species per sample compared to 24 to 30 species in the period 1995 – 2001. It seems tempting to explain this increase by the success of the new colonizers mentioned above. However, in spite of their success these species are still too sparsely represented in the samples to contribute substantially to this measure of species richness. The limited role of these species is also reflected in the total number of species in the area (162) which was well within the range of values found in previous years (135 to 178). Apparently there was a number of species that have been found now and then in previous years, but were not found in 2002. The absence of the latter species apparently neutralized the presence of the new species, so that the diversity did not change.

Offshore area (Fig. 15a-c)

The plots of the population densities of 11 of the commonest species show that most populations fluctuate around an average level, without showing a clear temporal trend. However a few species show a more or less consistent pattern. The sea urchin *Echinocardium cordatum* shows a slight increasing trend from 1995 onwards. This trend continued in 2002, particularly in terms of biomass. Populations of the gastropod *Euspira nitida* reached a low in 1999, but started recovery in 2000. This recovery continued in 2001 and 2002.

Usually the Offshore area has the poorest benthic fauna. Total fauna densities, biomass and diversity are generally the lowest in this area. In 2002 the total fauna density was again by far the lowest here (Tab. 2). However, the biomass was not particularly low and at a level that is usually found in the Oyster Ground. The high biomass values are mainly due to the presence of relatively much large sea urchins (*Echinocardium cordatum*). Also the number of species per sample was relatively high and Shannon Wiener diversity was at a similar level as in the Oyster Ground and at the Dogger bank.

A particular rich station was again OFF 33, west of IJmuiden. After values of about 20 species per sample in the second half of the nineties, this number increased to 32 in 2000, 35 in 2001 and 39 in 2002. Remarkable elements in the fauna were the brittle star *Amphiura filiformis* (usually only occurring in the Oyster Ground), the gastropods *Alvania lactea* and *Tornus subcarinatus*, an unidentified polyplacophoran and the polychaete *Syllis gracilis*. Since some of the species at this station are dwellers of solid substrate, it has been suggested that the sample could have been taken close to a ship's wreck. This was verified by J. Kamphuis (North Sea Directorate) and he found out that there is a wreck indeed at a distance of 450 m in southeastern direction (205°). This is not in the immediate vicinity of the sampling station, but since the prevailing current is in northeastern direction it can not be excluded that faunal elements from the wreck are sometimes transported in this direction by bottom currents.

There were 3 species that have not been found before during the BIOMON program. For the polychaetes *Lagisca extenuata* and *Syllis gracilis* we could not found any record from the DCS, so probably these species are new to the Dutch fauna. The bivalve *Striarca lactea* is not new because it has been recorded from a few stations on the DCS in other research programs, e.g. one station in the Offshore area near a gas platform (Daan & Mulder, 1994). The polychaete *Nephtys assimilis*, a new species in 2001, was now found at 3 stations in the Offshore area.

Coastal area (Fig. 16a-c)
Among the most common species in the Coastal area there were two species, *Euspira nitida* and *Tellina fabula,* that had shown an increase in 2001. Both species did not further increase in 2002 but remained at a stable level. This holds also for most of the other common species. However, there seems to be a tendency for an increase in the abundance of the amphipod *Urothoe poseidonis* and in the biomass of the sea urchin *Echinocardium cordatum* from 1998 onwards. The densities of the polychaete *Nephtys cirrosa* were still at a low level. After a steep decline in 1996 this species has never reached its former densities. *N. cirrosa* is a species of sandy sediments and also occurs at the Dogger Bank and the Offshore area. Since the species showed low densities also at the Dogger Bank and, to a lesser extent, in the Offshore area, there seems to be a trend that covers the whole DCS.

Like in previous years, high biomass values were found at stations where banks of bivalves (*Spisula subtruncata* and/or *Ensis americanus*) occurred and/or where large sea urchins (*Echinocardium cordatum*) were found. Particularly high values occurred at the stations COA 2, 3, 8 and 9. At stations where such banks were absent, the biomass values were generally low.

The polychaete *Nephtys assimilis*, a new species in 2001 and already mentioned for the Oyster Ground and Offshore area, was also present at 3 stations in the Coastal area. Finally we found a small bivalve species which we identified as '*Sphenia binghami*'. We use quotes here since it is not sure whether the identification is correct or not. It is possible that it is in fact a juvenile *Mya truncata.* This has to be verified by comparing it to specimens present in a scientific collection.

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Tables and Figures

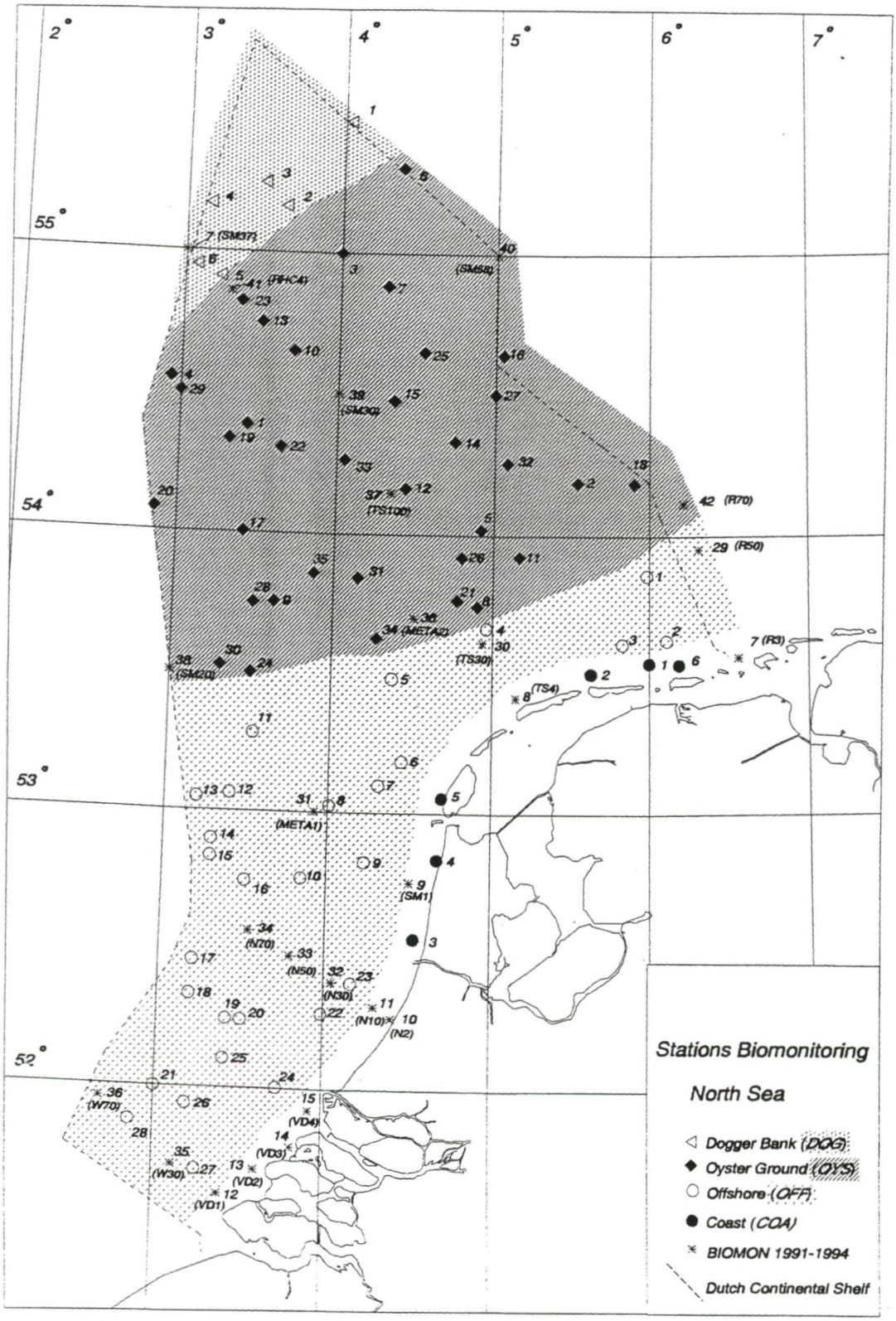

Fig. 1. Locations of the sampling stations

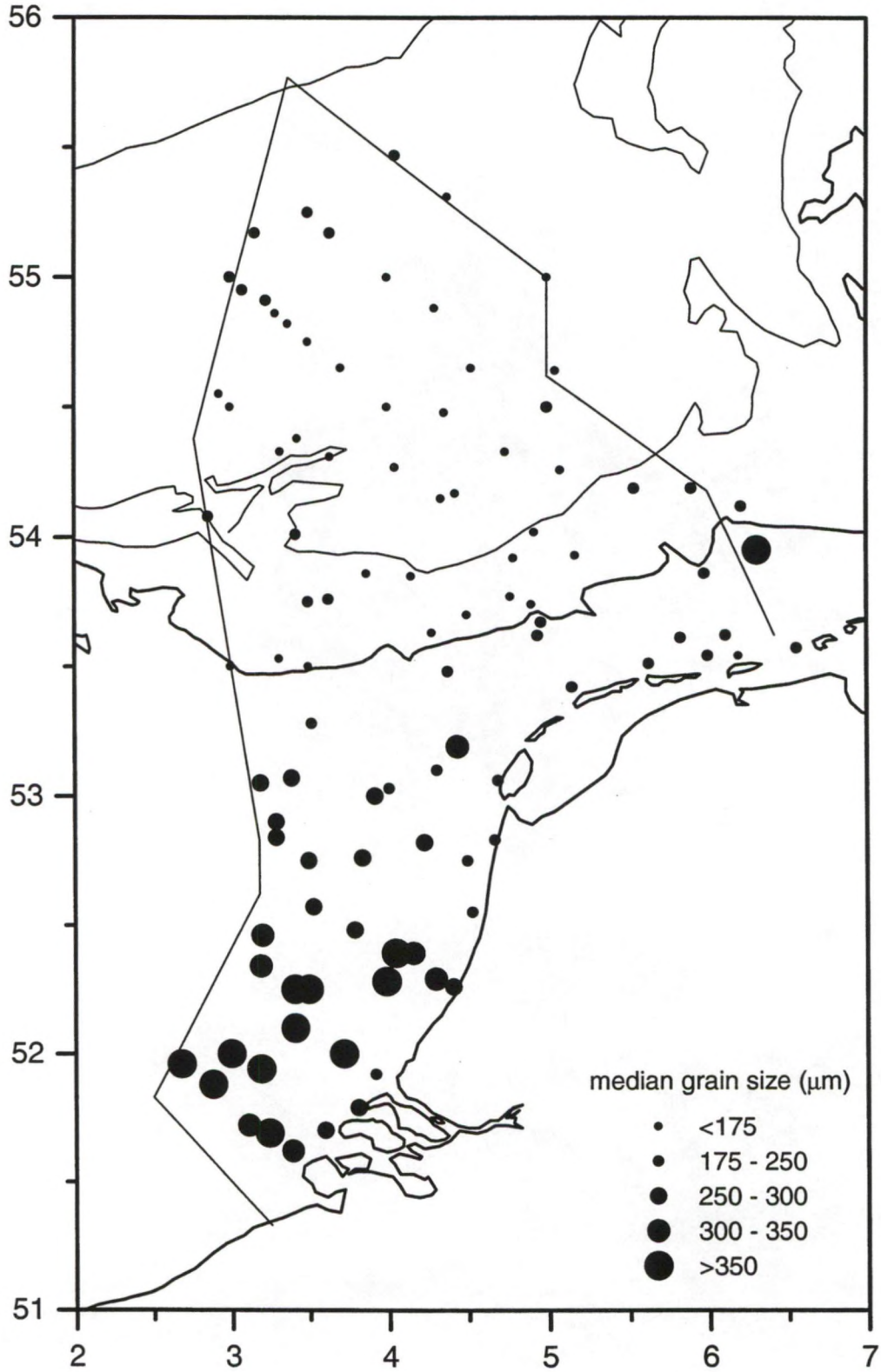

Fig. 2: Median grain size (µm) of the sediment in 2002

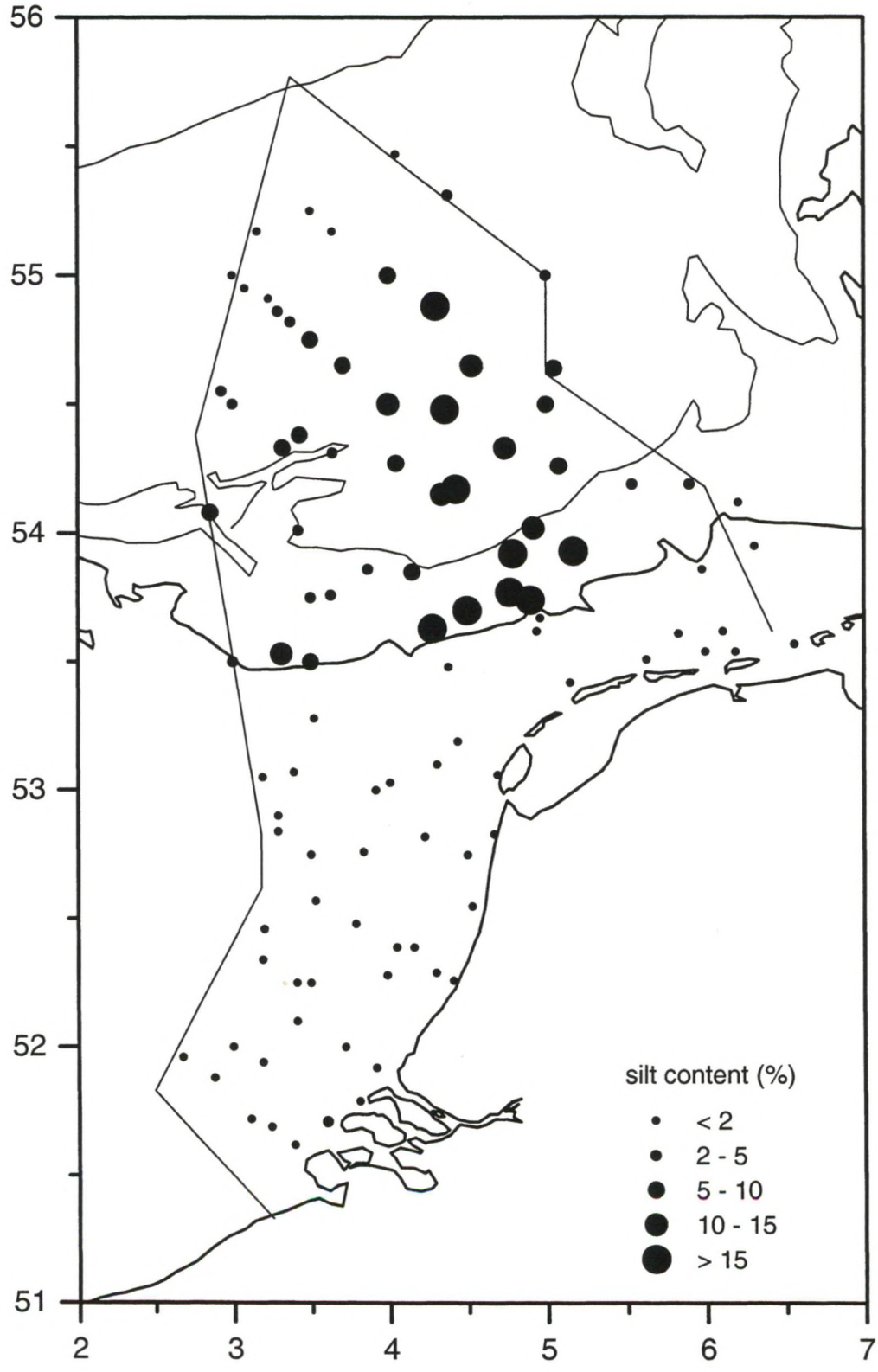

Fig. 3: Silt content (fraction <63 μm) of the sediment in 2002.

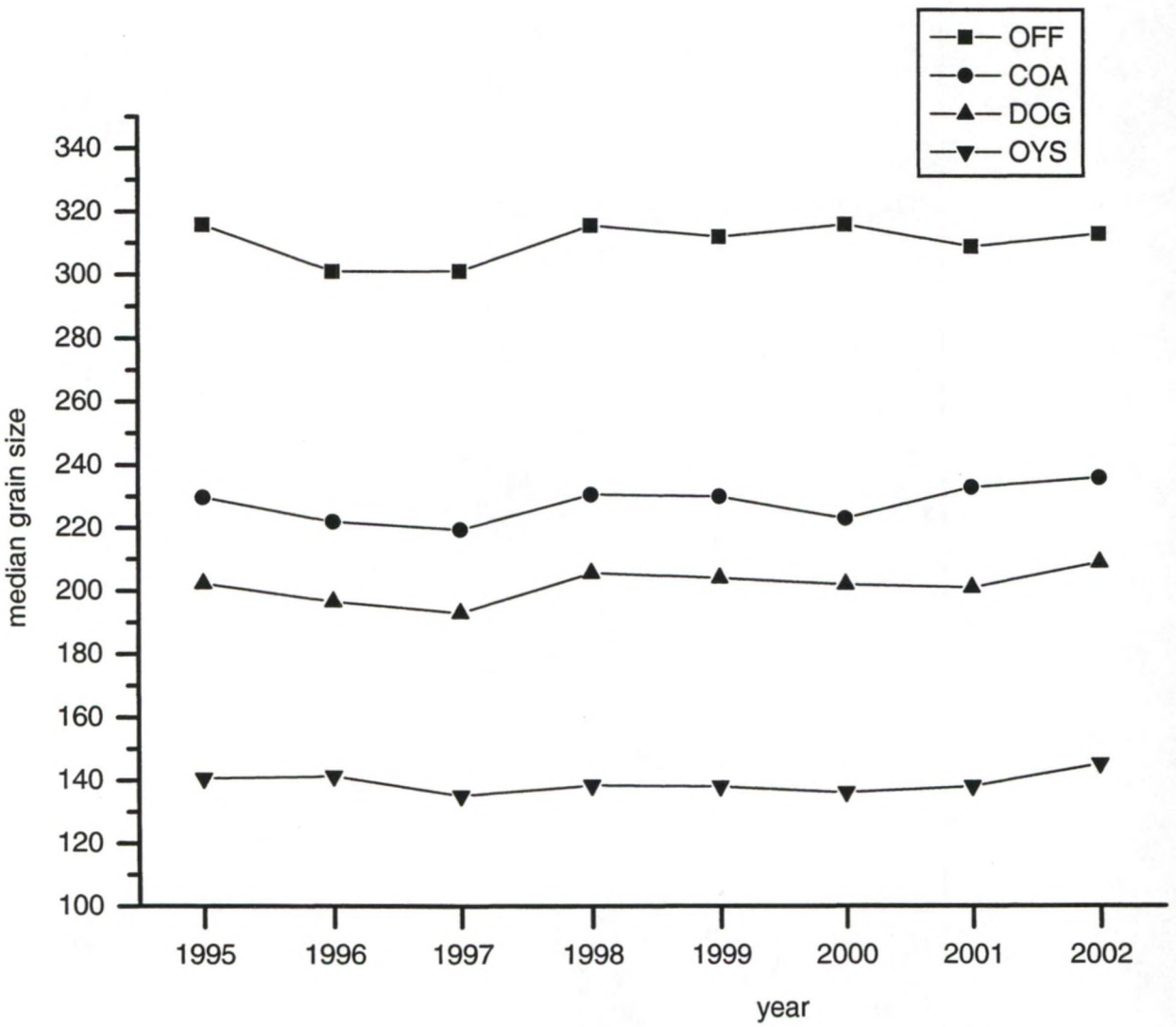

Fig. 4: Temporal trends in the mean median grain size in the four subareas.

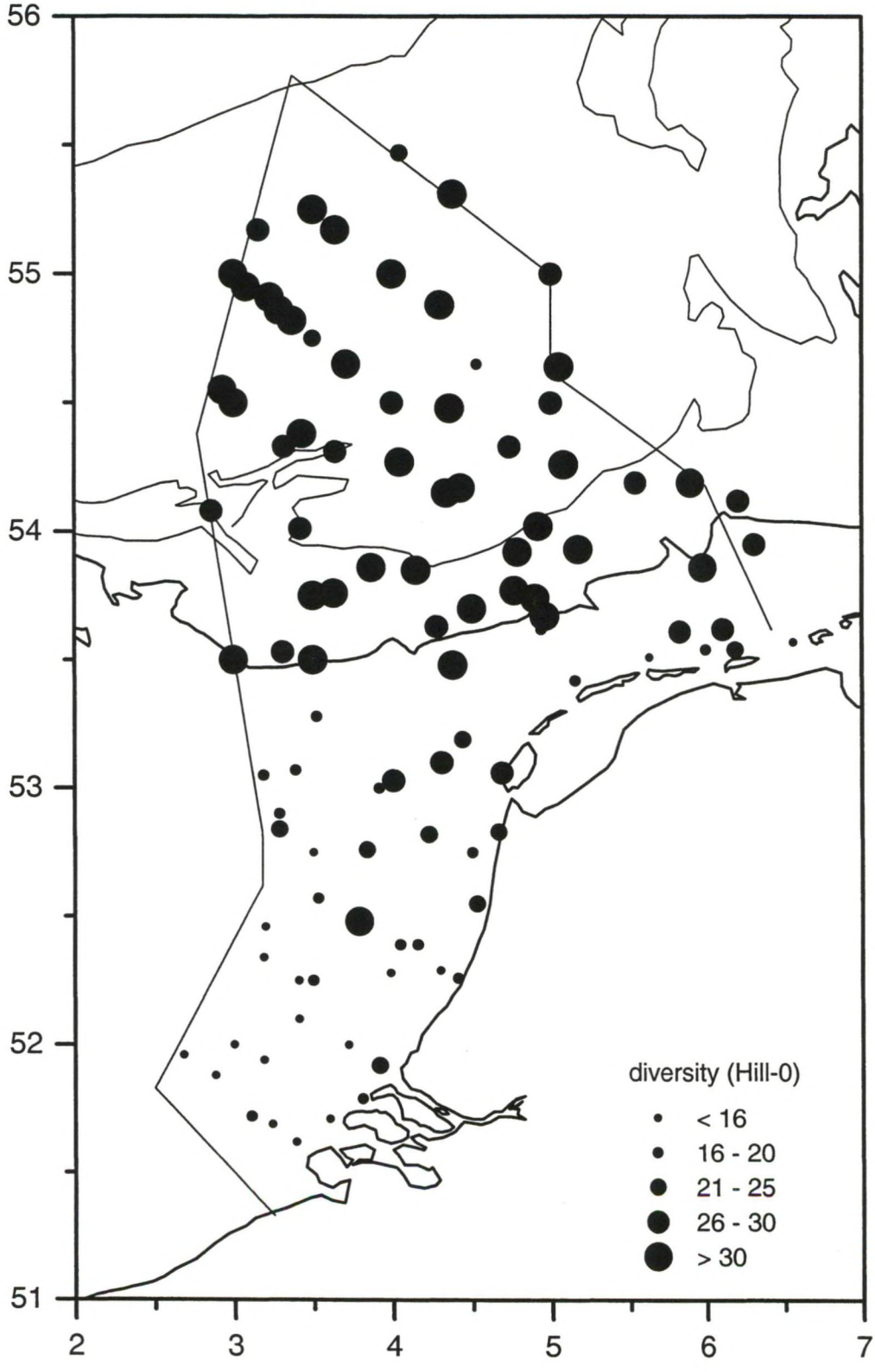

Fig. 5: The number of species per sample (Hill-0) in 2002.

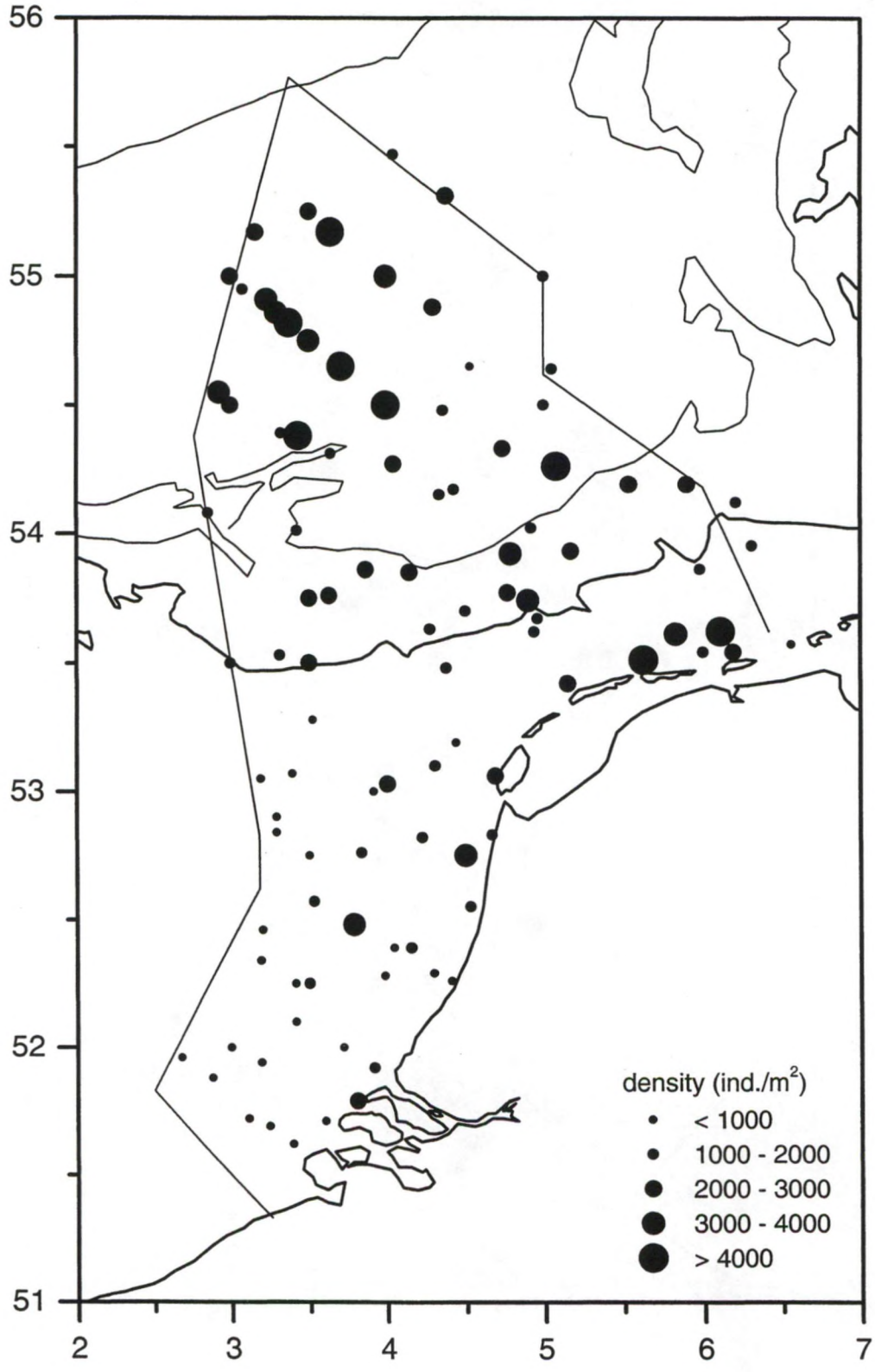

Fig. 6: The total fauna density in 2002.

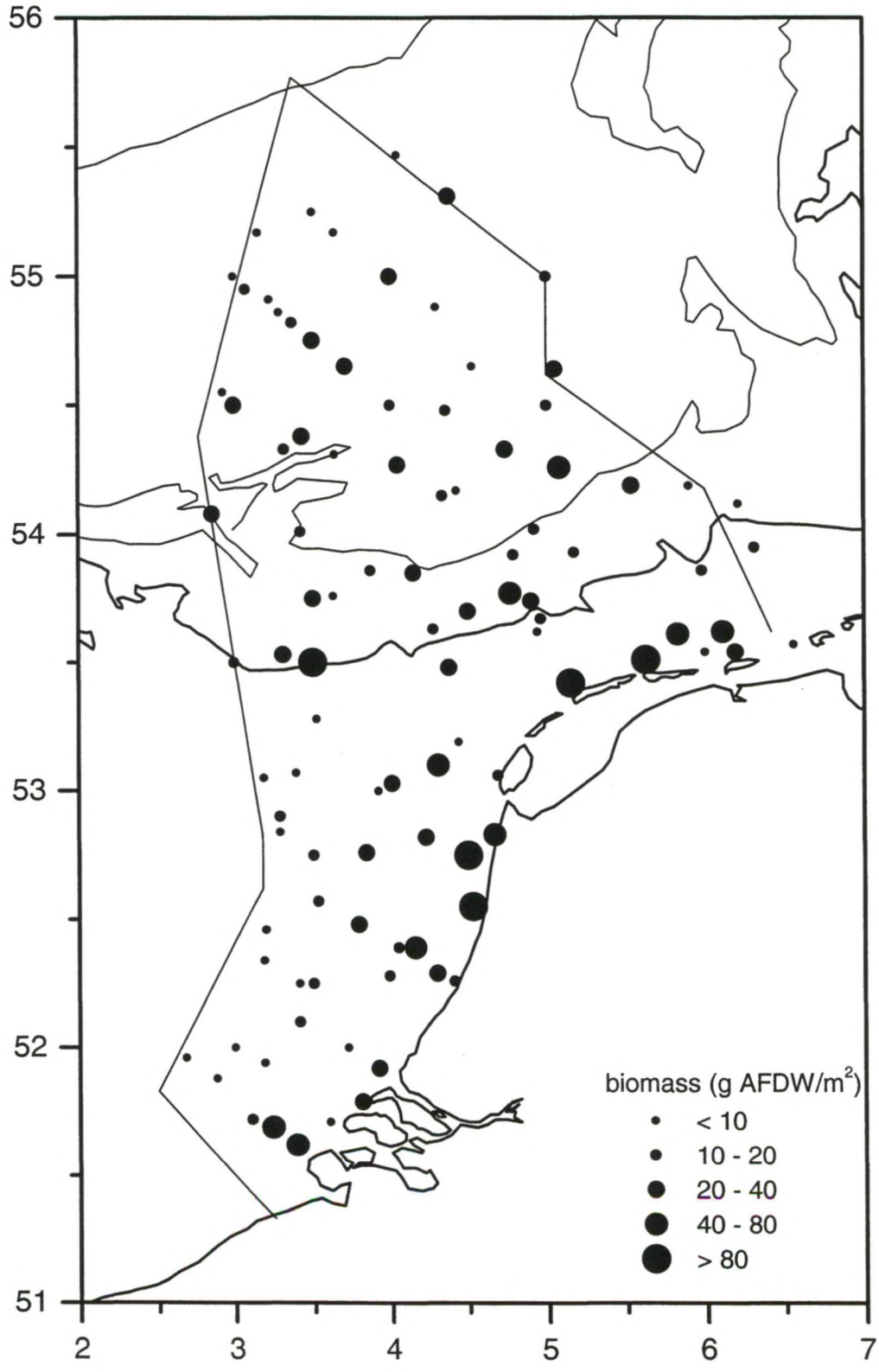

Fig. 7: The total biomass (g AFDW/m2) of the macrobenthos in 2002.

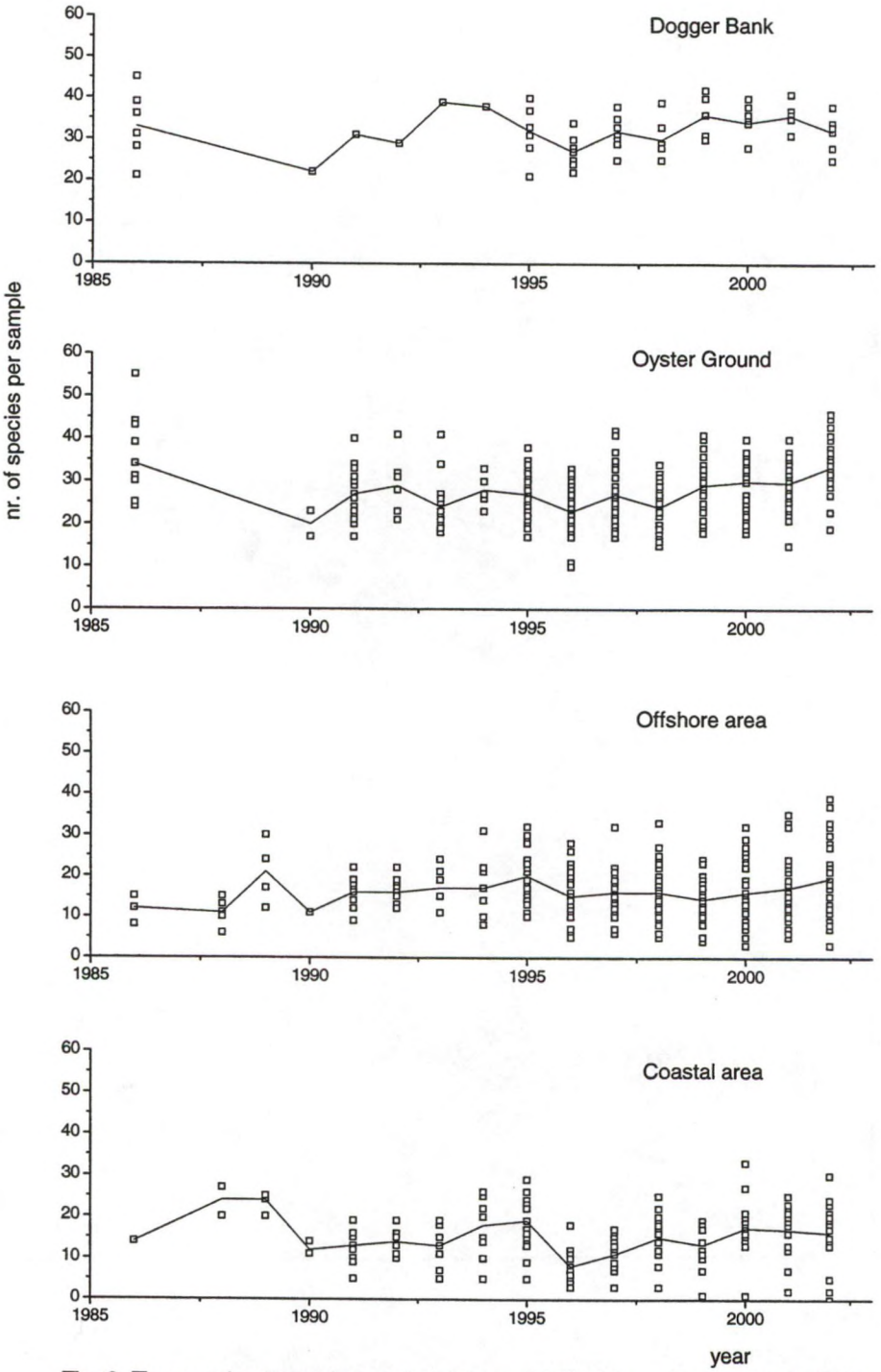

Fig. 8: Temporal patterns in species richness (Hill-0) between 1986 and 2002.

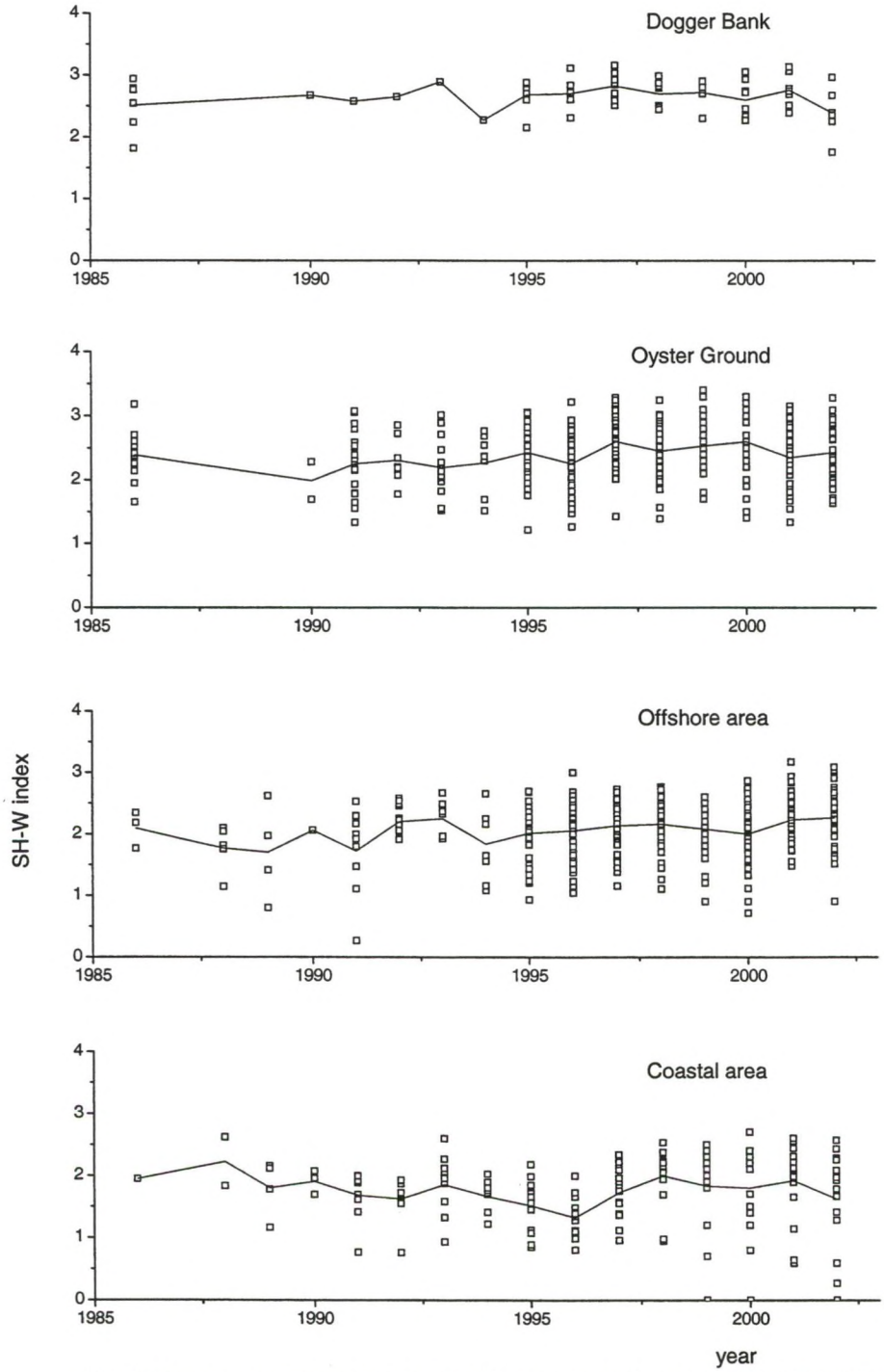

Fig. 9: Temporal patterns in Shannon-Wiener diversity between 1986 and 2002.

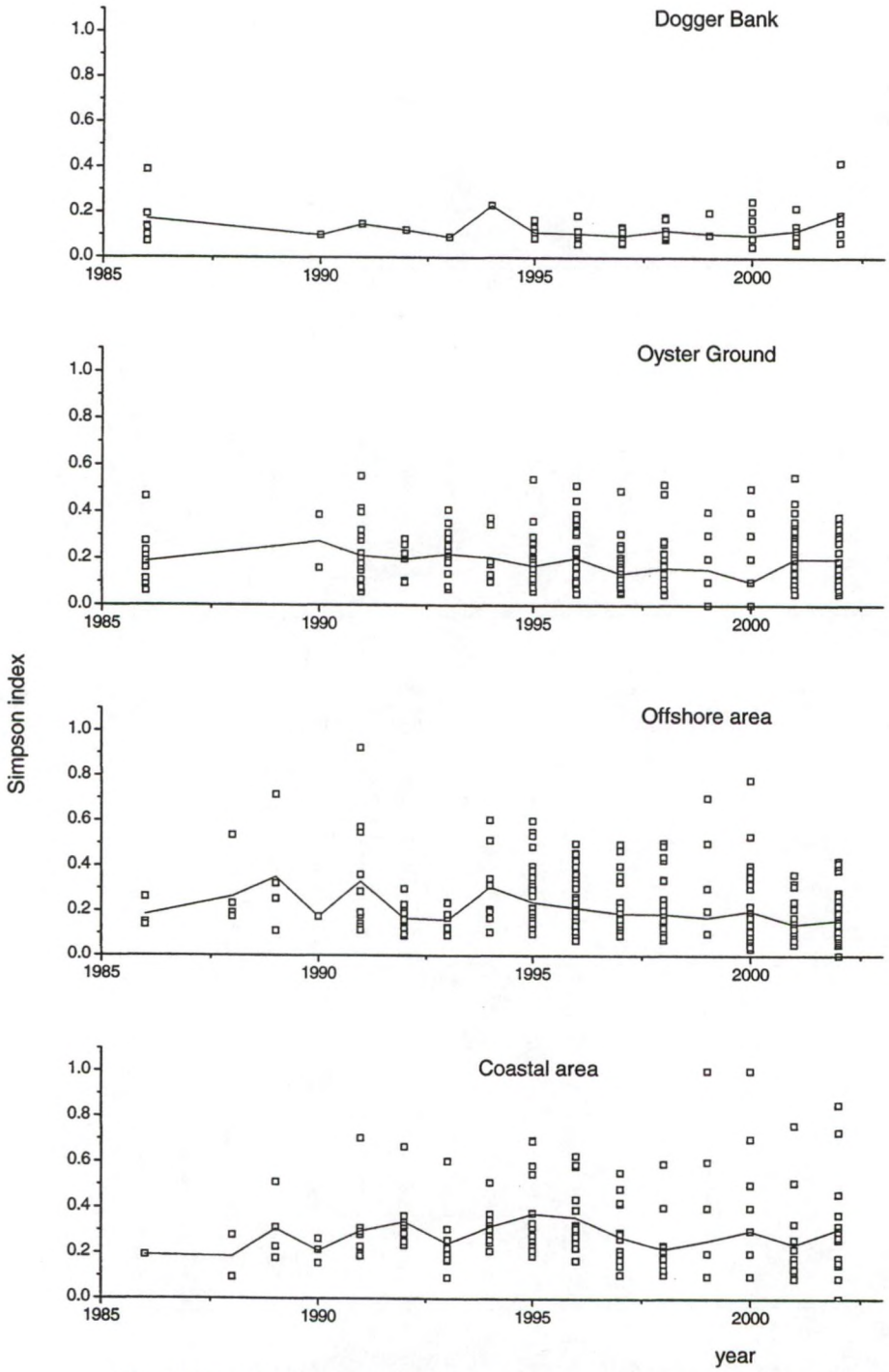

Fig. 10: Temporal patterns Simpson's dominance between 1986 and 2002.

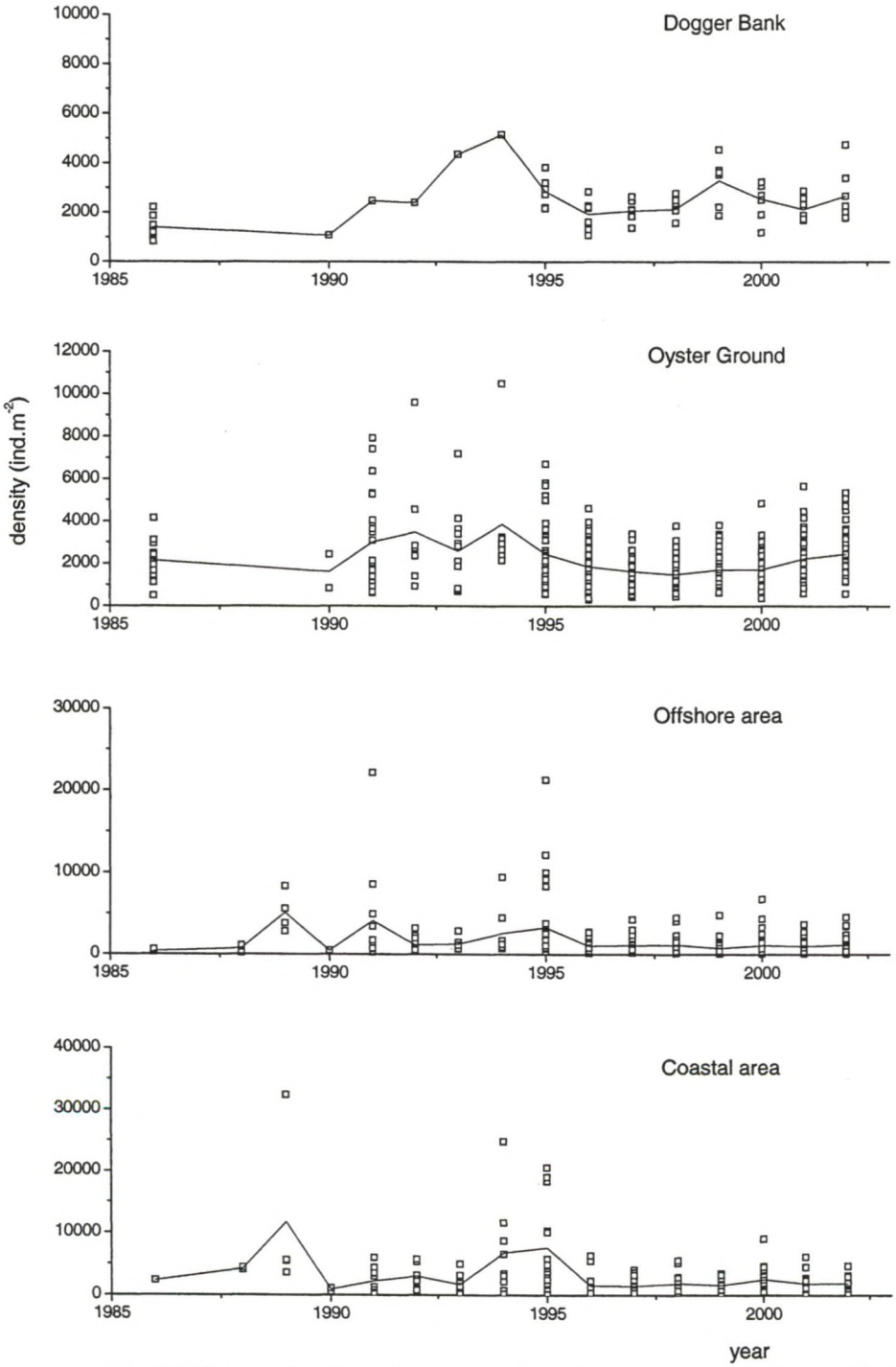

Fig. 11: Temporal patterns in macrobenthos density between 1986 and 2002.

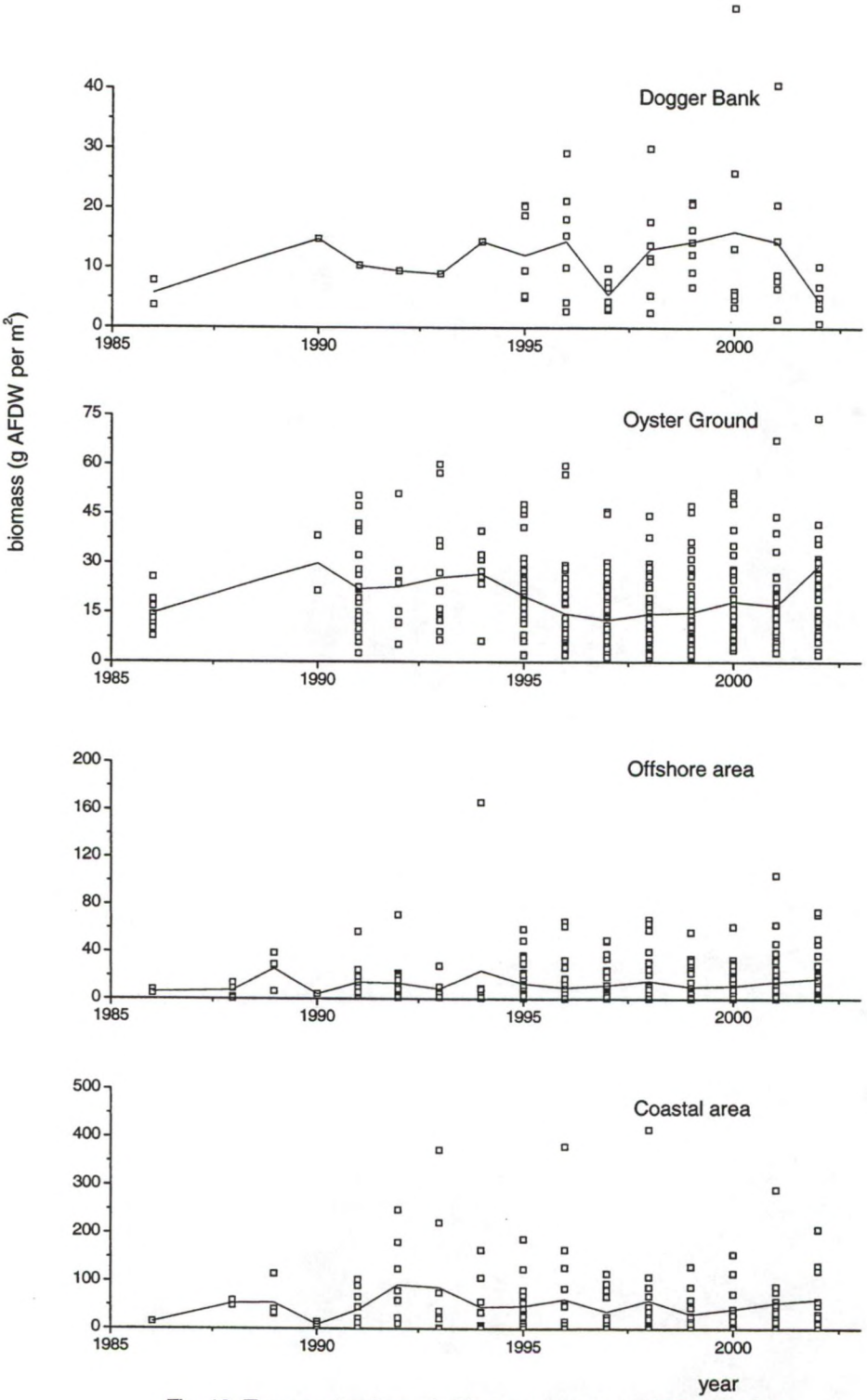

Fig. 12: Temporal patterns in biomass between 1986 and 2002.

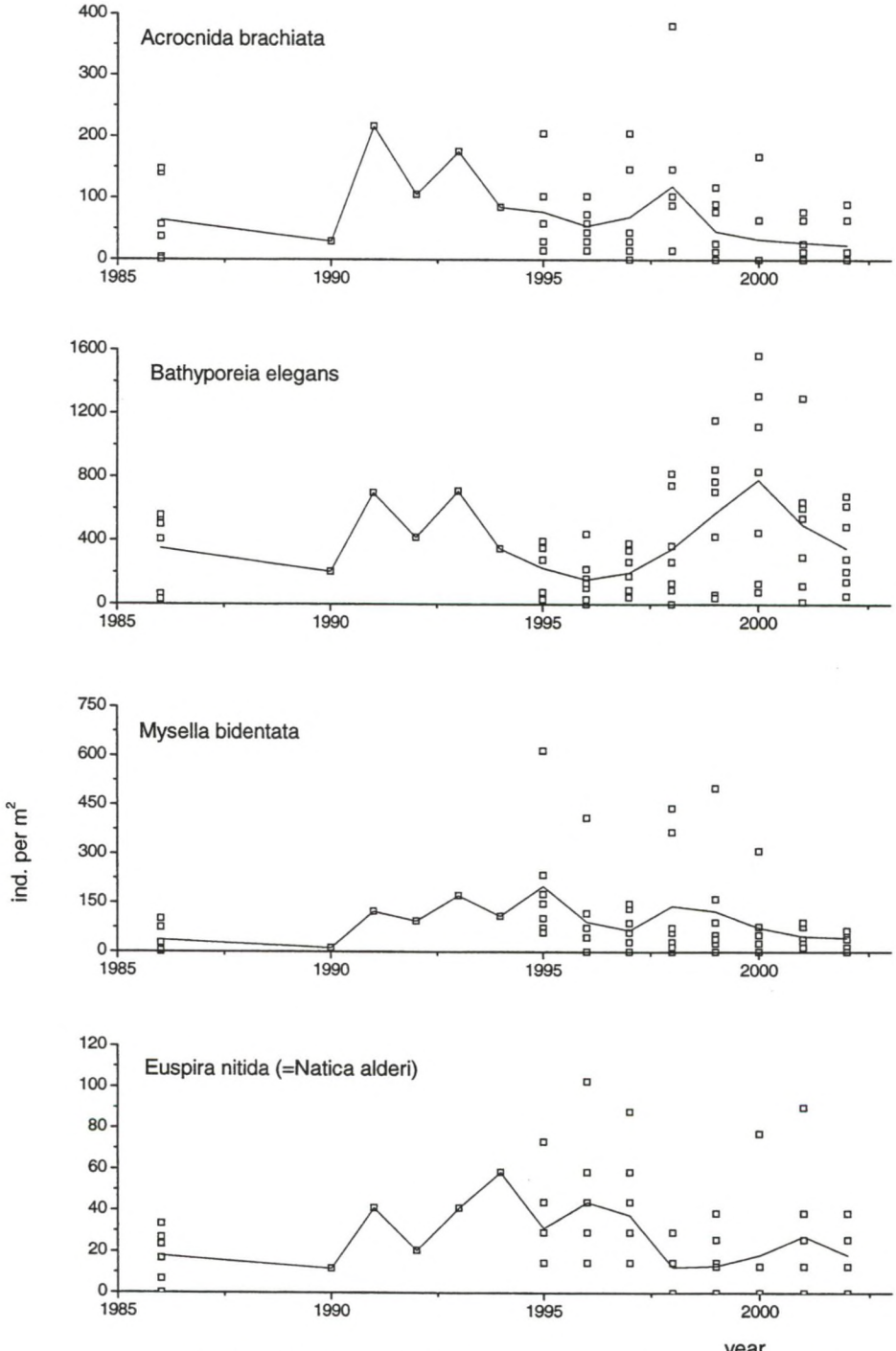

Fig. 13a: Densities of 4 species at the Dogger Bank (1986-2002)

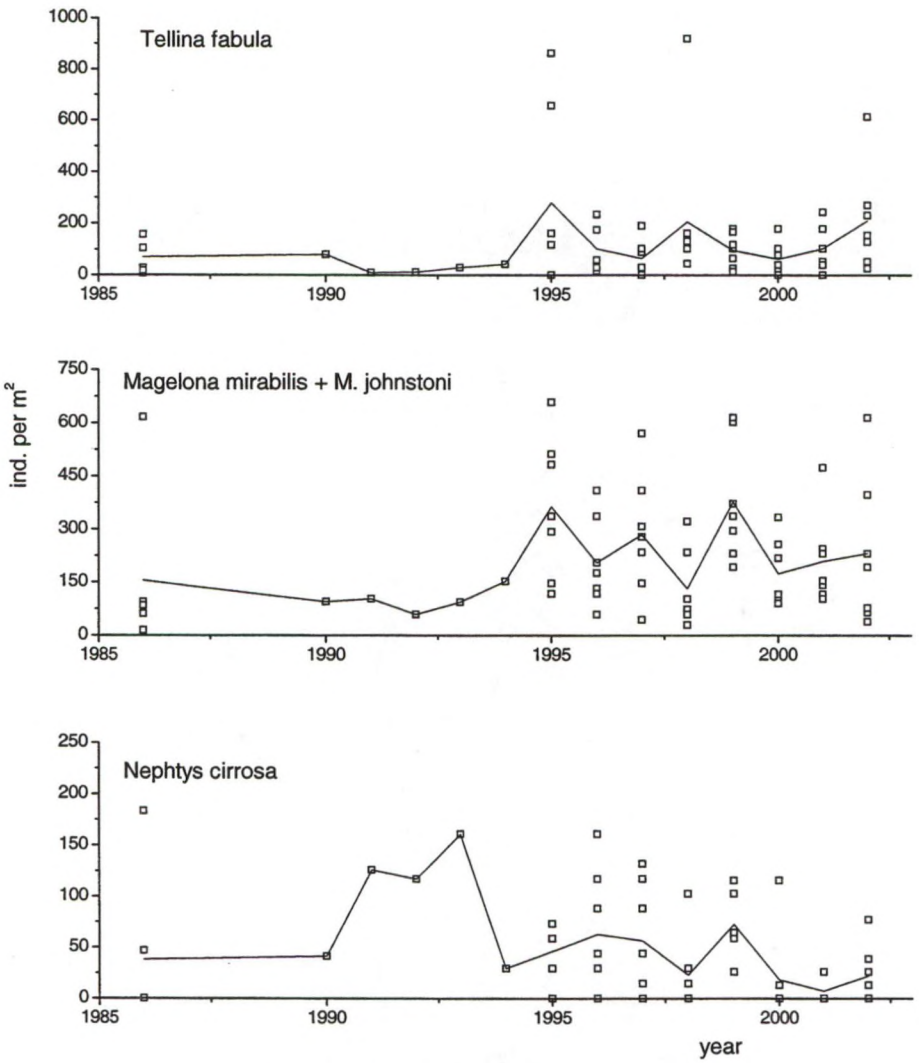

Fig. 13b: Densities of 3 species at the Dogger Bank (1986-2002)

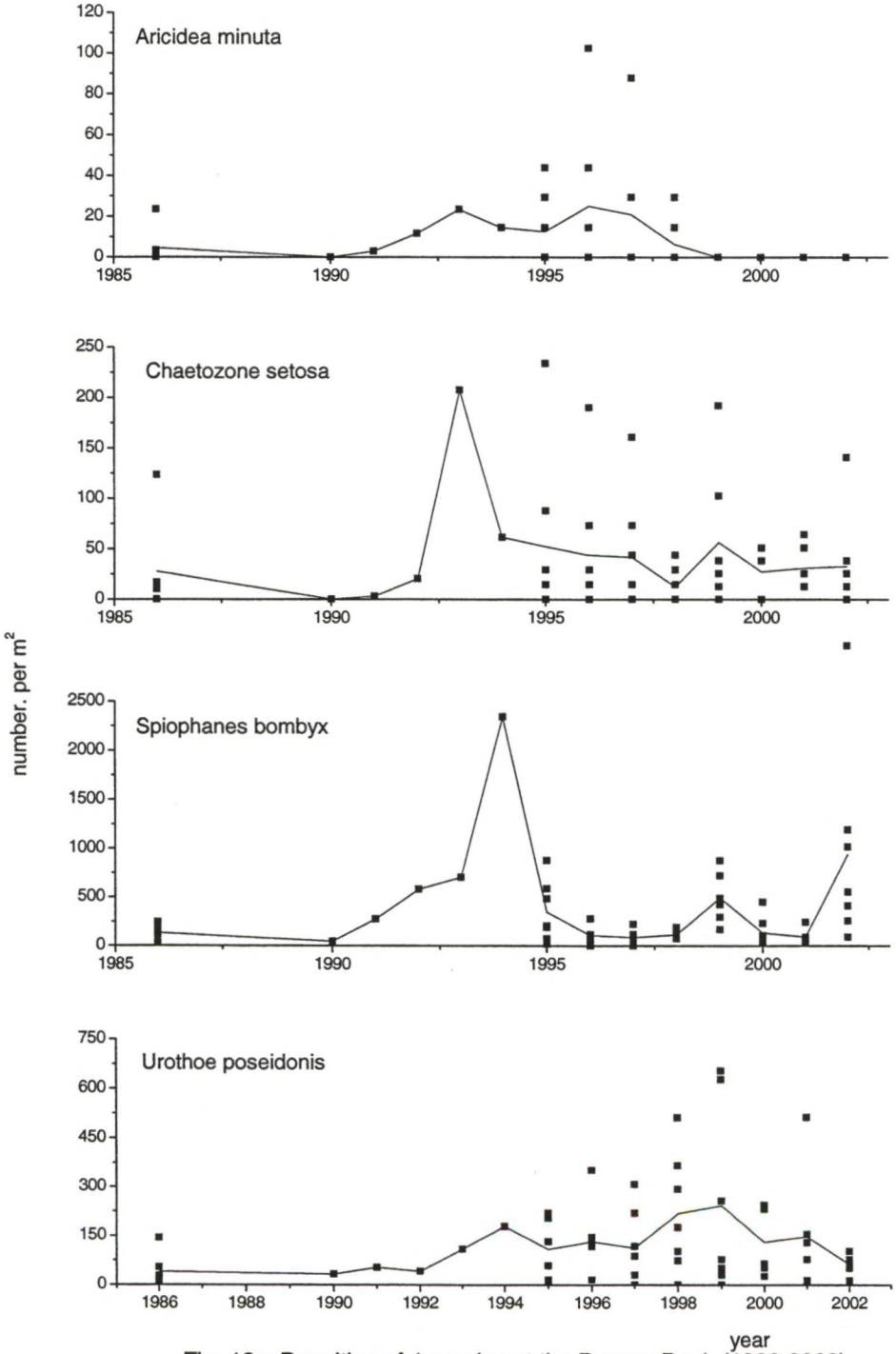

Fig. 13c: Densities of 4 species at the Dogger Bank (1986-2002)

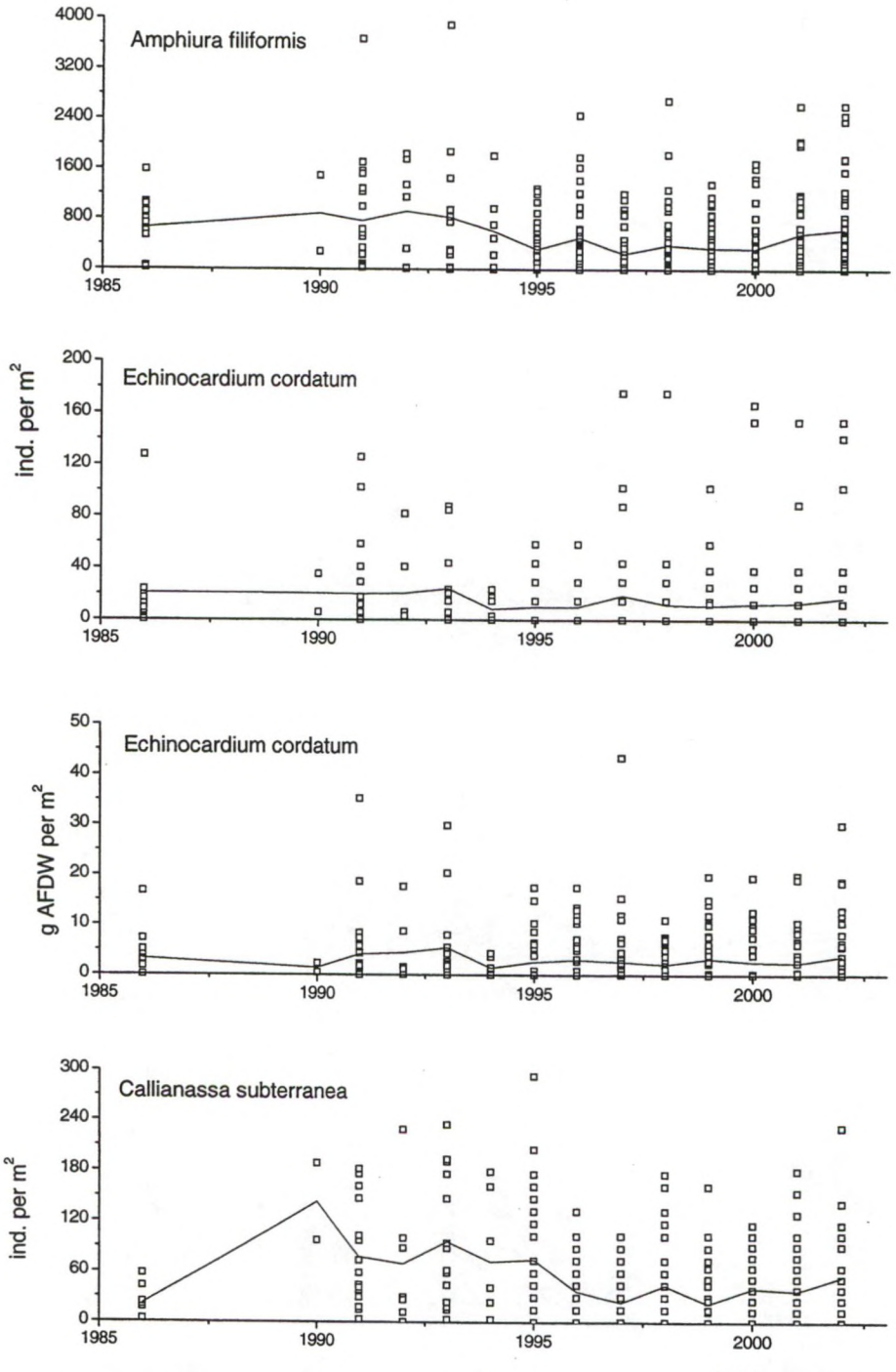

Fig. 14a: Densities (and biomass for E. cordatum) of 3 species in the Oyster Ground (1986-2002).

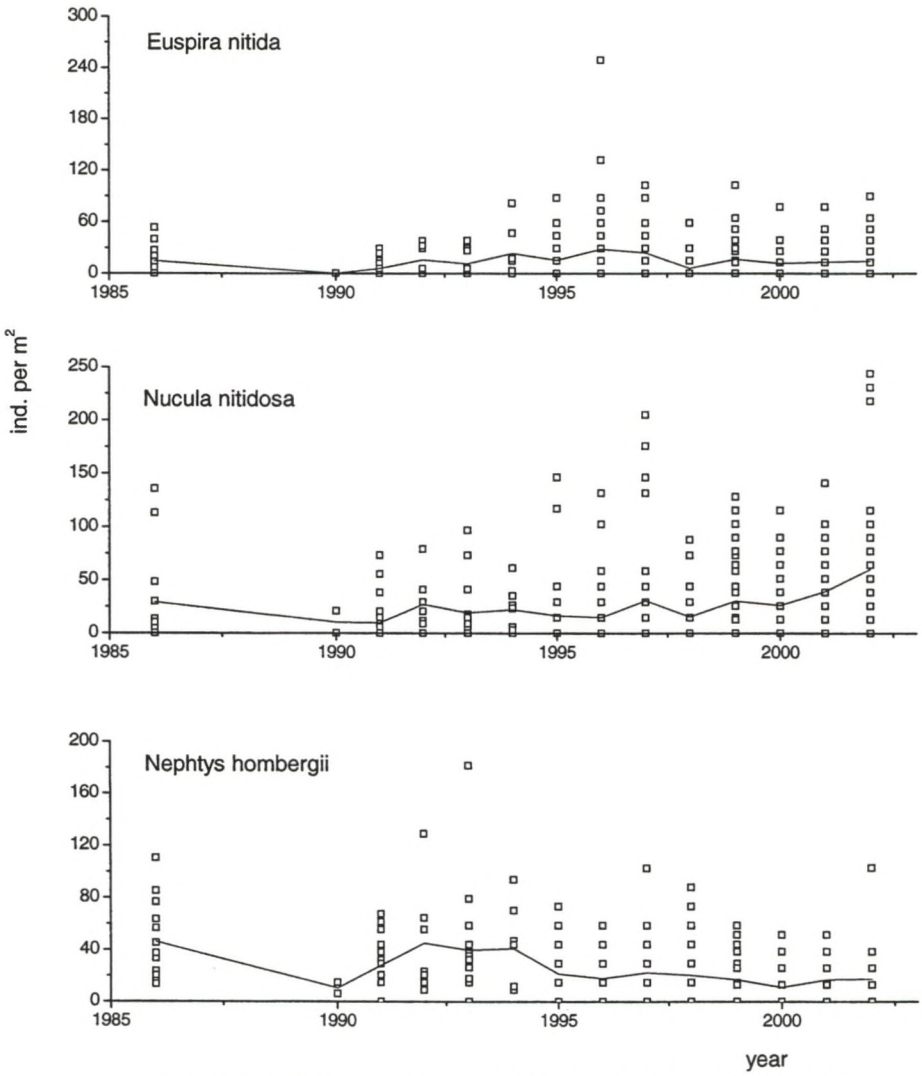

Fig. 14b: Densities of 3 species in the Oyster Ground (1986-2002)

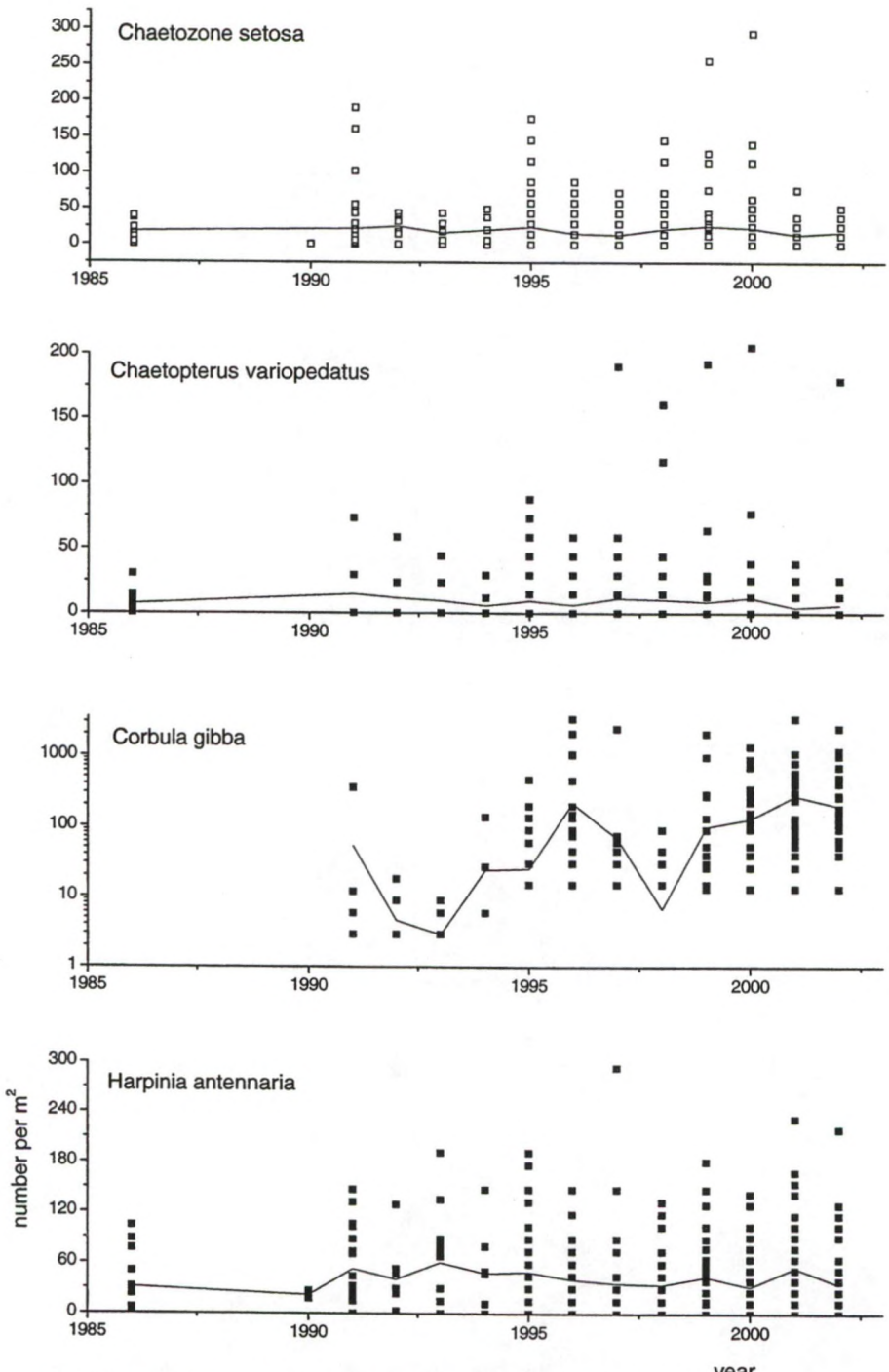

Fig. 14c: Densities of 4 species in the Oyster Ground (1986-2002).

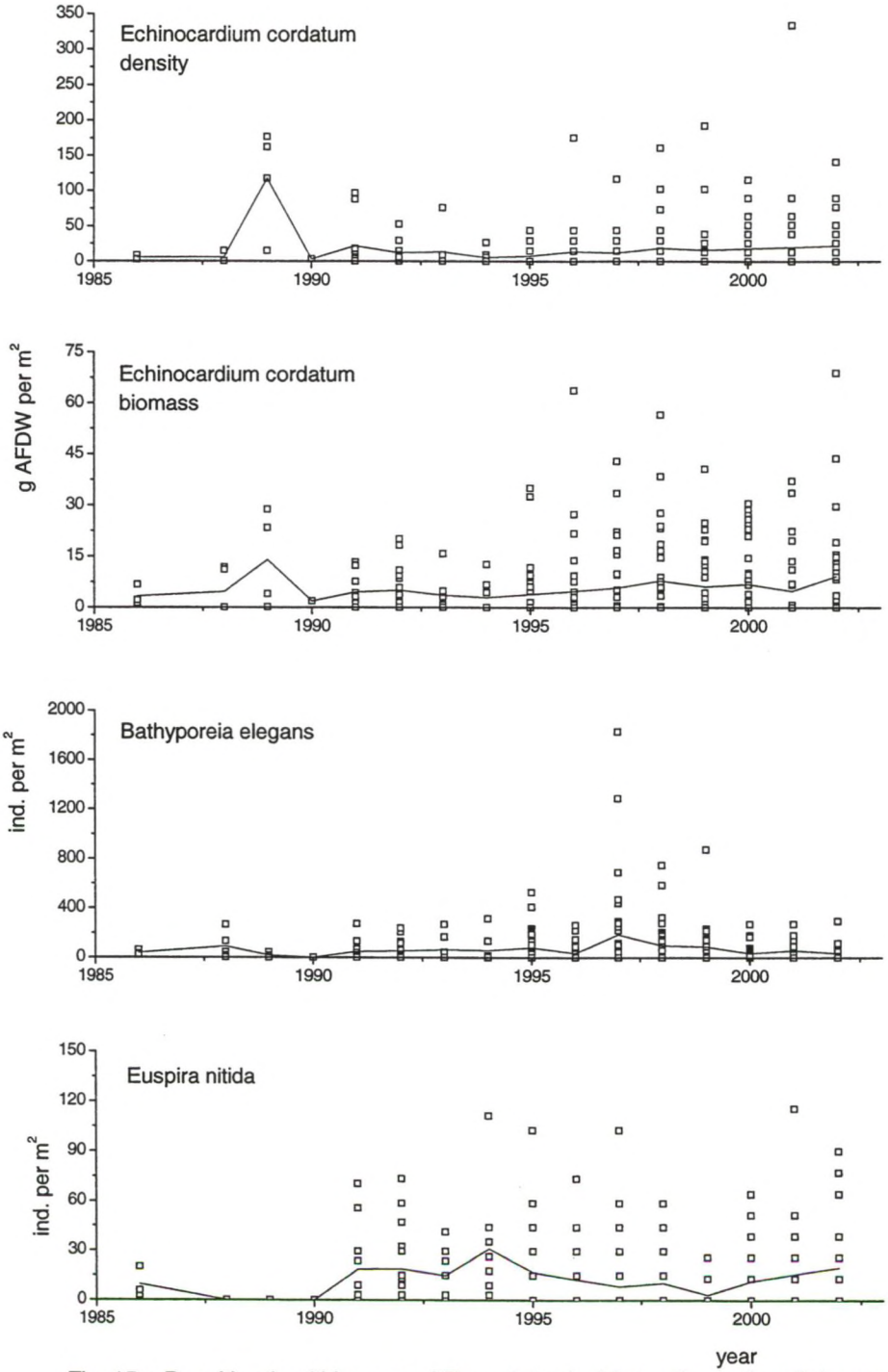

Fig. 15a: Densities (and biomass of E. cordatum) of 3 species in the offshore area (1986-2002).

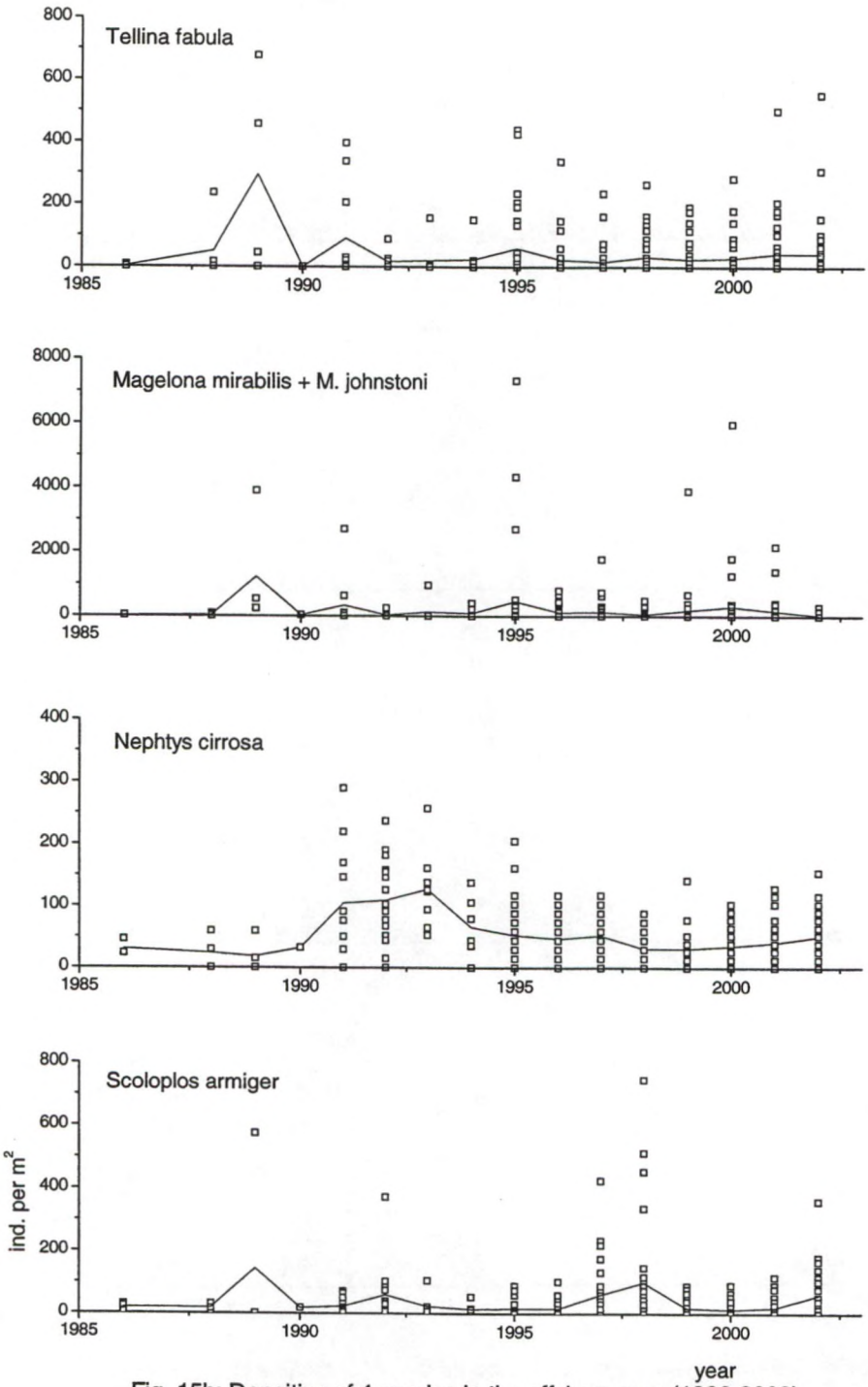

Fig. 15b: Densities of 4 species in the offshore area (1986-2002)

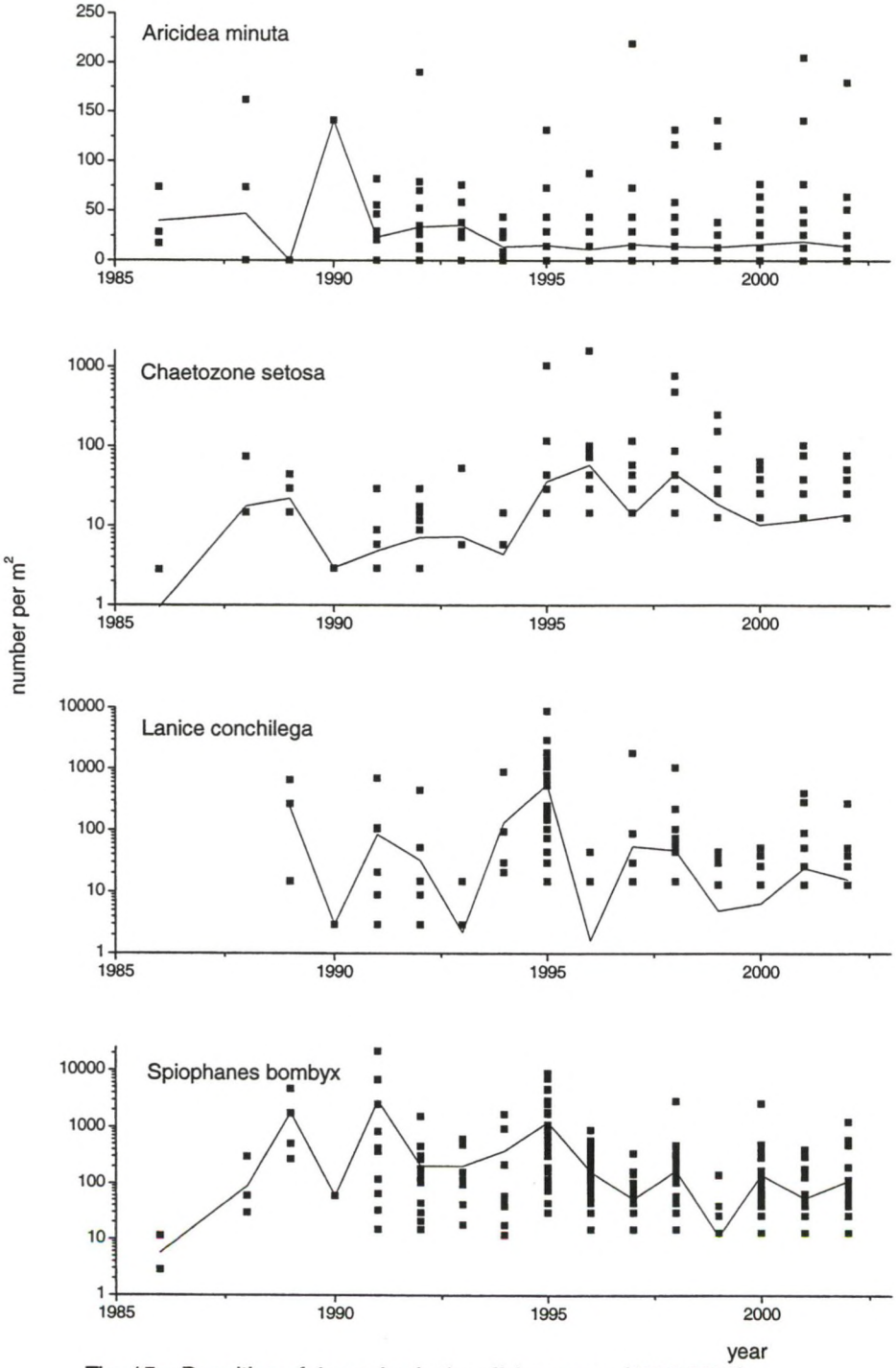

Fig. 15c: Densities of 4 species in the offshore area (1986-2002).

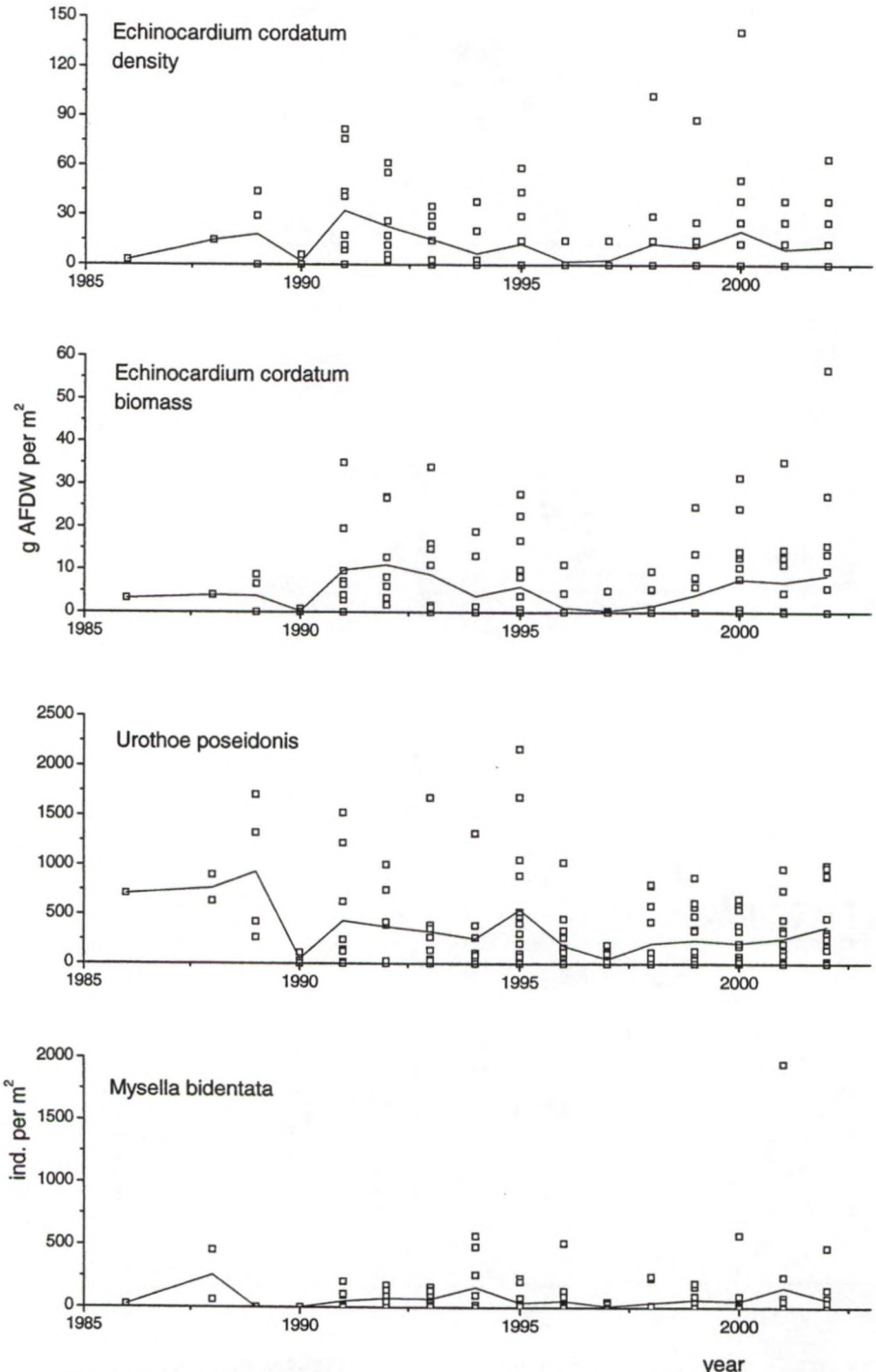

Fig. 16a: Densities (and biomass of E. cordatum) of 4 species in the coastal area (1986-2002).

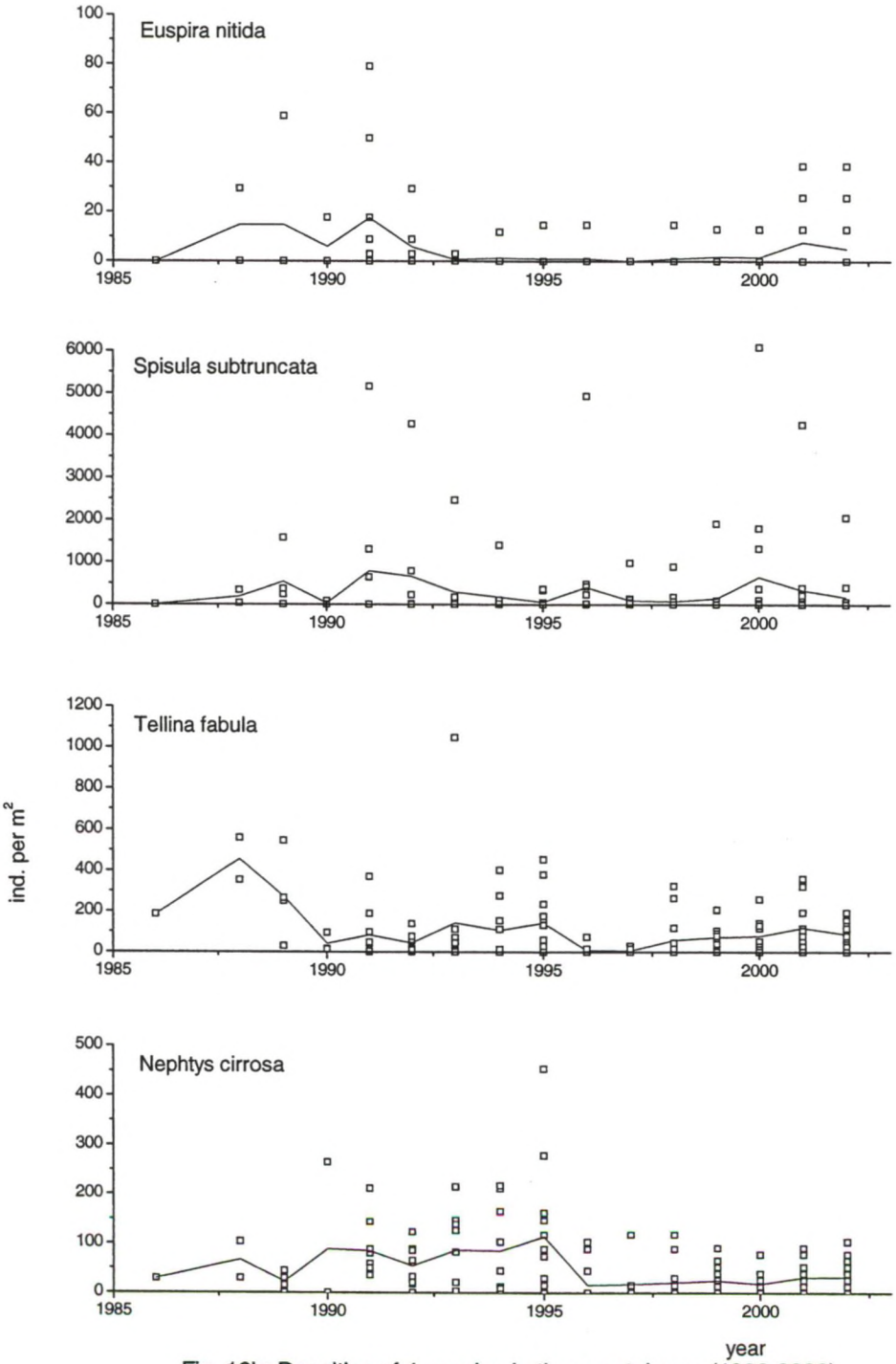

Fig. 16b: Densities of 4 species in the coastal area (1986-2002)

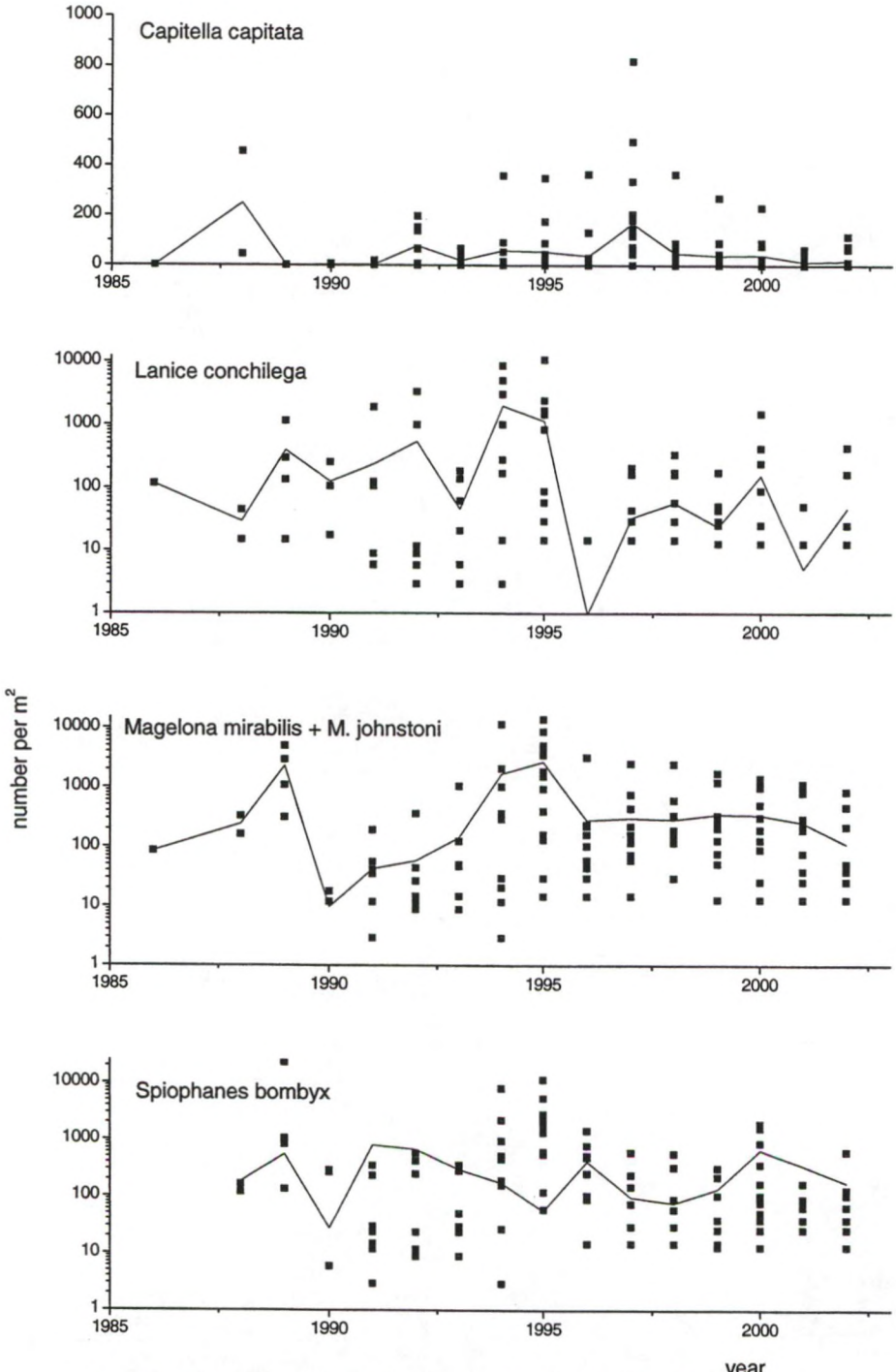

Fig. 16c: Densities of 4 species in the coastal area (1986-2002).

Table 1a. Station number, position, date, depth and sediment composition of the survey 2002.

Station (name)			Geographical position				Sediment composition		
NIOZ code		DONAR code	E	N	Date	Depth (m)	Med.Gr. Size (µm)	Mud (%) Fr.<63 µm	Mud (%) Fr.16-63 µm
DOG	1	DOGGBK06	04°03'00"	55°28'18"	10/04/2002	30.0	238	0.2	0.0
DOG	2	DOGGBK02	03°38'30"	55°10'00"	11/04/2002	36.2	192	0.8	0.0
DOG	3	DOGGBK03	03°30'00"	55°15'00"	10/04/2002	28.1	214	0.5	0.0
DOG	4	TERSLG235	03°09'26"	55°10'14"	10/04/2002	30.1	206	0.4	0.0
DOG	5	DOGGBK04	03°14'00"	54°54'42"	27/03/2002	35.7	186	1.6	0.0
DOG	6	DOGGBK05	03°05'00"	54°57'06"	27/03/2002	23.0	227	0.3	0.0
DOG	7	DOGGBK08	03°00'00"	55°00'00"	27/03/2002	25.0	202	0.6	0.0
OYS	1	OESTGDN43	03°25'30"	54°23'00"	26/03/2002	45.5	113	9.7	4.5
OYS	2	FRIESFT16	05°32'30"	54°11'30"	09/04/2002	39.0	213	4.2	0.0
OYS	3	OESTGDN02	04°00'00"	55°00'00"	11/04/2002	47.6	117	9.7	2.6
OYS	4	OESTGDN03	02°56'00"	54°33'00"	26/03/2002	34.0	140	2.1	0.0
OYS	5	FRIESFT02	04°55'00"	54°01'10"	09/04/2002	43.0	128	14.3	3.1
OYS	6	OESTGDN04	04°22'48"	55°18'24"	10/04/2002	46.0	157	4.1	0.0
OYS	7	OESTGDN05	04°18'00"	54°53'00"	11/04/2002	50.3	90	16.9	9.5
OYS	8	FRIESFT03	04°54'00"	53°44'40"	21/03/2002	37.0	172	17.3	5.1
OYS	9	FRIESFT04	03°37'50"	53°45'20"	13/03/2002	37.5	193	3.2	0.0
OYS	10	OESTGDN06	03°42'30"	54°39'00"	27/03/2002	44.3	112	8.8	2.7
OYS	11	FRIESFT05	05°10'00"	53°55'30"	09/04/2002	40.0	150	15.4	6.4
OYS	12	OESTGDN07	04°26'00"	54°10'00"	26/03/2002	49.0	97	15.3	6.6
OYS	13	OESTGDN08	03°30'00"	54°45'00"	27/03/2002	44.5	115	5.8	1.8
OYS	14	OESTGDN09	04°44'30"	54°20'00"	09/04/2002	47.0	143	13.3	2.4
OYS	15	OESTGDN10	04°21'20"	54°28'30"	04/04/2002	50.1	98	15.7	6.7
OYS	16	OESTGDN11	05°03'00"	54°38'30"	10/04/2002	47.0	151	9.7	3.6
OYS	17	OESTGDN12	03°25'08"	54°00'21"	13/03/2002	42.0	207	2.0	0.0
OYS	18	FRIESFT06	05°54'00"	54°11'20"	09/04/2002	37.0	219	2.4	0.0
OYS	19	OESTGDN13	03°19'00"	54°20'00"	26/03/2002	48.2	125	6.6	1.8
OYS	20	OESTGDN14	02°51'51"	54°05'00"	13/03/2002	51.8	204	6.8	0.9
OYS	21	TERSLG50	04°46'03"	53°46'04"	04/04/2002	38.0	120	18.4	5.8
OYS	22	OESTGDN15	03°38'30"	54°18'30"	26/03/2002	43.7	172	3.2	0.0
OYS	23	OESTGDN16	03°22'00"	54°49'24"	27/03/2002	41.5	137	3.3	0.0
OYS	24	BREEVTN34	03°29'46"	53°30'00"	12/03/2002	33.2	132	8.0	2.5
OYS	25	OESTGDN17	04°32'00"	54°39'00"	04/04/2002	49.6	127	12.7	5.2
OYS	26	FRIESFT07	04°47'30"	53°55'20"	04/04/2002	42.0	136	15.3	3.9
OYS	27	OESTGDN18	05°00'00"	54°30'00"	09/04/2002	44.0	184	7.2	0.0
OYS	28	FRIESFT08	03°30'00"	53°45'00"	13/03/2002	36.0	199	2.6	0.0
OYS	29	OESTGDN19	03°00'00"	54°30'00"	26/03/2002	36.2	125	2.4	0.0
OYS	30	BREEVTN02	03°18'21"	53°31'30"	12/03/2002	35.1	128	10.1	3.3
OYS	31	FRIESFT09	04°09'06"	53°50'42"	13/03/2002	44.0	139	8.0	1.7
OYS	32	FRIESFT10	05°05'00"	54°15'30"	09/04/2002	42.0	162	9.3	2.6
OYS	33	OESTGDN20	04°03'00"	54°16'00"	26/03/2002	47.8	105	7.3	2.7
OYS	34	FRIESFT11	04°16'37"	53°37'40"	13/03/2002	37.6	117	16.2	6.0
OYS	35	FRIESFT12	03°52'24"	53°51'31"	13/03/2002	40.0	160	3.6	0.0
OYS	36	FRIESFT17	04°30'00"	53°42'05"	13/03/2002	39.0	113	18.2	5.8
OYS	37	TERSLG100	04°20'27"	54°09'04"	26/03/2002	49.3	100	14.4	5.8
OYS	38	BREEVTN26	03°00'00"	53°30'00"	12/03/2002	32.5	144	2.8	0.0
OYS	39	OESTGDN22	04°00'00"	54°30'00"	27/03/2002	44.7	114	11.5	3.5
OYS	40	OESTGDN21	05°00'00"	55°00'00"	10/04/2002	41.0	153	3.4	0.0
OYS	41	OESTGDN23	03°17'36"	54°51'42"	27/03/2002	39.3	147	2.2	0.0
OYS	42	ROTTMPT70	06°12'51"	54°07'03"	09/04/2002	33.0	249	0.7	0.0

Table 1a. Station number, position, date, depth and sediment composition of the survey 2002.

Station (name)			Geographical position				Sediment composition		
NIOZ code		DONAR code	E	N	Date	Depth (m)	Med.Gr. Size (µm)	Mud (%) Fr.<63 µm	Mud (%) Fr.16-63 µm
OFF	1	FRIESFT13	05°59'00"	53°51'30"	03/04/2002	31.0	217	0.9	0.0
OFF	2	WADDKT07	06°06'25"	53°37'29"	03/04/2002	23.3	206	0.6	0.0
OFF	3	WADDKT02	05°49'37"	53°36'40"	03/04/2002	26.2	187	1.0	0.0
OFF	4	FRIESFT14	04°57'30"	53°40'00"	21/03/2002	31.0	202	1.7	0.0
OFF	5	FRIESFT15	04°22'30"	53°29'00"	20/03/2002	28.5	219	1.9	0.0
OFF	6	BREEVTN03	04°26'32"	53°11'16"	20/03/2002	31.0	310	0.7	0.0
OFF	7	BREEVTN04	04°18'22"	53°05'59"	20/03/2002	36.0	241	1.3	0.0
OFF	8	BREEVTN05	04°00'30"	53°01'30"	20/03/2002	29.0	246	0.8	0.0
OFF	9	BREEVTN06	04°13'50"	52°49'20"	21/03/2002	26.0	262	0.4	0.0
OFF	10	BREEVTN07	03°50'30"	52°45'40"	20/03/2002	30.3	292	0.5	0.0
OFF	11	BREEVTN08	03°31'18"	53°17'00"	12/03/2002	27.1	202	1.9	0.0
OFF	12	BREEVTN09	03°23'30"	53°03'55"	12/03/2002	28.0	279	0.9	0.0
OFF	13	BREEVTN10	03°11'36"	53°02'58"	12/03/2002	29.4	286	0.6	0.0
OFF	14	BREEVTN11	03°17'20"	52°53'53"	12/03/2002	32.8	283	0.6	0.0
OFF	15	BREEVTN12	03°17'18"	52°50'12"	12/03/2002	33.3	295	0.8	0.0
OFF	16	BREEVTN13	03°30'00"	52°45'00"	12/03/2002	26.5	267	0.6	0.0
OFF	17	BREEVTN14	03°12'12"	52°27'43"	25/03/2002	28.0	310	0.5	0.0
OFF	18	BREEVTN15	03°11'25"	52°20'25"	25/03/2002	29.0	344	0.3	0.0
OFF	19	BREEVTN16	03°24'42"	52°15'10"	25/03/2002	28.8	362	0.6	0.0
OFF	20	BREEVTN17	03°30'00"	52°15'00"	25/03/2002	30.3	369	0.4	0.0
OFF	21	BREEVTN18	03°00'00"	52°00'00"	11/03/2002	37.0	478	0.2	0.0
OFF	22	BREEVTN19	03°59'15"	52°16'30"	22/03/2002	23.3	372	0.6	0.0
OFF	23	BREEVTN20	04°09'50"	52°23'08"	20/03/2002	22.5	331	0.5	0.0
OFF	24	BREEVTN21	03°42'58"	52°00'00"	11/03/2002	28.0	530	0.3	0.0
OFF	25	BREEVTN22	03°24'26"	52°06'12"	19/03/2002	31.0	376	0.5	0.0
OFF	26	BREEVTN23	03°11'34"	51°56'07"	11/03/2002	29.9	448	0.5	0.0
OFF	27	BREEVTN24	03°14'28"	51°41'40"	19/03/2002	26.7	414	1.6	0.0
OFF	28	BREEVTN25	02°52'48"	51°52'40"	19/03/2002	34.0	435	0.3	0.0
OFF	29	ROTTMPT50	06°18'36"	53°57'14"	09/04/2002	31.0	367	0.3	0.0
OFF	30	TERSLG30	04°56'17"	53°36'56"	21/03/2002	25.0	216	1.0	0.0
OFF	31	BREEVTN27	03°55'01"	52°59'53"	20/03/2002	26.0	254	0.5	0.0
OFF	32	NOORDWK30	04°02'53"	52°23'15"	20/03/2002	23.3	333	0.4	0.0
OFF	33	NOORDWK50	03°47'07"	52°28'30"	12/03/2002	30.0	290	0.8	0.0
OFF	34	NOORDWK70	03°31'53"	52°34'10"	12/03/2002	31.0	286	0.6	0.0
OFF	35	WALCRN30	03°06'49"	51°43'06"	19/03/2002	28.4	333	0.6	0.0
OFF	36	WALCRN70	02°40'45"	51°57'25"	19/03/2002	44.0	409	0.4	0.0
COA	1	WADDKT03	05°59'53"	53°32'34"	03/04/2002	18.3	224	0.6	0.0
COA	2	WADDKT04	05°37'48"	53°30'19"	03/04/2002	8.9	185	1.0	0.0
COA	3	HOLLSKT03	04°31'50"	52°32'50"	14/03/2002	18.2	233	1.9	0.0
COA	4	HOLLSKT02	04°40'00"	52°50'00"	02/04/2002	11.3	236	0.7	0.0
COA	5	WADDKT05	04°41'20"	53°03'23"	02/04/2002	11.4	201	0.6	0.0
COA	6	WADDKT06	06°11'03"	53°32'09"	03/04/2002	7.7	168	1.4	0.0
COA	7	ROTTMPT3	06°32'46"	53°34'57"	03/04/2002	7.2	200	0.3	0.0
COA	8	TERSLG4	05°09'02"	53°24'54"	02/04/2002	12.5	213	0.8	0.0
COA	9	HOLLSKT04	04°30'00"	52°45'00"	14/03/2002	21.2	228	1.6	0.0
COA	10	NOORDWK2	04°24'20"	52°15'36"	14/03/2002	13.0	255	1.5	0.0
COA	11	NOORDWK10	04°18'01"	52°17'41"	14/03/2002	18.5	340	0.6	0.0
COA	12	VOORDTA2	03°23'15"	51°37'04"	18/03/2002	11.5	302	3.3	2.7
COA	13	VOORDTA3	03°36'02"	51°42'23"	11/04/2002	5.1	289	4.1	3.9
COA	14	VOORDTA4	03°48'48"	51°47'26"	11/04/2002	3.6	269	0.6	0.0
COA	15	VOORDTA5	03°55'09"	51°55'20"	11/03/2002	14.5	201	1.0	0.0

Table 2. Mean values of abiotic and biotic parameters in the 4 areas in 2002.

	AREA			
	Dogger Bank	Oyster Ground	Offshore area	Coastal area
No. of stations	7	42	36	15
Median Grain Size (μm)	209	145	313	236
Silt content (fr.< 63um,%)	0.6	8.7	0.7	1.3
silt (fr. 16- 63um, %)	0.0	2.5	0.0	0.4
Depth (m)	30	42	29	12
Diversity:				
Total number of species	70	162	108	66
Number of specier per core	31.9	33.5	19.4	16.1
Shannon- Wiener diversity	2.39	2.43	2.26	1.62
Simpson's dominance	0.19	0.20	0.16	0.31
No. individuals (ind./m²):				
Crustaceans	698	222	258	496
Echinoderms	141	696	44	27
Molluscs	334	692	154	868
Polychaetes	1457	567	579	454
Miscellaneous	44	293	142	36
TOTAL DENSITY	2674	2470	1177	1881
Biomass (g AFDW/m²):				
Crustaceans	0.2	5.3	1.0	0.2
Echinoderms	2.0	7.4	9.6	8.6
Molluscs	2.0	9.6	3.8	46.8
Polychaetes	0.3	5.8	2.4	4.0
Miscellaneous	0.0	1.1	0.7	2.4
TOTAL BIOMASS	4.5	29.2	17.5	62.0

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Abra alba								+							+			+		+				+	ABRAALBA
Abra nitida																						+				ABRANITI
Abra prismatica													+													ABRAPRIS
Acanthocardia echinata																	+									ACANECHI
Acanthocardia spec. juv.																										ACANJUVE
Acrocnida brachiata		+	+		+						+															ACROBRAC
Alvania lactea																										ALVALACT
Ampelisca brevicornis		+												+							+					AMPEBREV
Ampelisca tenuicornis								+		+		+		+					+			+	+			AMPETENU
Ampharete acutifrons																										AMPHACUT
Ampharete finmarchica																										AMPHFINM
Ampharete spec.									+																	AMPHSPEC
Amphioxus lanceolatus																										AMPHLANC
Amphiura chiajei	+		+	+	+	+	+																			AMPHCHIA
Amphiura filiformis								+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	AMPHFILI
Amphiura spec. juv		+	+								+															AMPHJUVE
Anthozoa spec.									+					+							+					ANTHOZOA
Aonides paucibranchiata																										AONIPAUC
Aphelochaeta marioni														+							+					APHEMARI
Apherusa ovalipes																										APHEOVAL
Aphrodite aculeata															+											APHRACUL
Arca lactea																										ARCALACT
Aplacophora																	+									APLACOPH
Argissa hamatipes																										ARGISHAMA
Aricidea minuta																										ARICMINU
Asterias rubens														+												ASTERUBE
Atylus falcatus	+					+	+																			ATYLFALC
Atylus swammerdami		+	+		+																					ATYLSWAM
Bathyporeia elegans	+	+	+	+	+	+	+			+	+	+	+	+		+							+	+	+	BATHELEG
Bathyporeia guilliamsoniana	+	+	+	+	+	+	+			+						+	+								+	BATHGUIL
Bivalve indet.																					+					BIVAINDE
Bopyrus squillarum																										BOPYSQUIL
Brissopsis lyrifera										+																BRISLYRI
Callianassa subterranea juv.								+	+	+		+	+		+	+		+	+	+	+	+			+	CALLJUVE
Callianassa subterranea								+	+			+			+	+	+	+	+	+	+	+	+	+	+	CALLSUBT
Callianassa tyrrhena																										CALLTYRR
Capitella capitata																										CAPICAPI
Caprellidae spec.																										CAPRELLI
Carcinus maenas																										CARCMAEN
Chaetopterus variopedatus									+				+								+	+				CHAEVARI
Chaetozone setosa	+	+	+		+		+	+		+	+		+			+	+			+	+	+		+	+	CHAESETO
Chamelea striatula			+	+		+		+			+									+						CHAMSTRI
Chone duneri																									+	CHONDUNE
Cirolana borealis																							+			CIROBORE
Corbula gibba									+			+		+	+	+		+	+		+	+	+	+	+	CORBGIBB
Corophium affine														+												COROAFFI
Corystes cassivelaunus																						+	+	+		CORYCASS
Corystes cassivelaunus juv.																				+						CORYJUVE
Cylichna cylindracea					+			+		+		+	+	+			+		+	+				+	+	CYLICYLI
Diastylis bradyi	+			+				+								+	+	+								DIASBRAD
Diogenes pugilator																										DIOGPUGI

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Diplocirrus glaucus								+		+	+	+			+	+	+	+		+		+		+		DIPLGLAU
Diplodonta rotundata																										DIPLOROT
Donax vittatus						+																				DONAVITT
Dosinia lupinus	+	+	+		+	+	+						+				+				+					DOSILUPI
Dyopedos monacanthus																			+							DYOPMONA
Ebalia cranchii																										EBALCRAN
Ebalia spec.juv.																						+				EBALJUVE
Ebalia tumefacta																								+		EBALTUME
Echinocardium cordatum			+					+		+				+			+		+	+	+		+	+	+	ECHICORD
Echinocyamus pusillus																										ECHIPUSI
Edwardsia claparedii							+		+	+	+															EDWACLAP
Ensis directus																										ENSIDIRE
Ensis arcuatus																										ENSIARCU
Ensis ensis						+																				ENSIENSI
Eteone barbata				+																						ETEOBARB
Eteone longa		+	+	+							+															ETEOLONG
Eudorella truncatula										+		+							+				+			EUDOTRUN
Eudorellopsis deformis										+						+								+		EUDODEFO
Eumida sanguinea																										EUMISANG
Eurydice spinigera																										EURYSPIN
Euspira nitida	+	+		+	+	+	+		+		+	+			+	+		+							+	EUSPNITI
Euzonus flabelligerus																										EUZOFLAB
Exogone hebes																+										EXOGHEBE
Gari costulata			+			+	+																			GARICOST
Gari fervensis			+			+																				GARIFERV
Gattyana cirrosa																			+			+				GATTCIRR
Glycera alba																										GLYCALBA
Glycera lapidum																						+				GLYCLAPI
Glycera rouxi																			+							GLYCROUX
Glycera spec. juv.												+						+				+				GLYCJUVE
Glycinde nordmanni									+												+					GLYCNORD
Golfingia elongata																		+	+							GOLFELON
Golfingia procera																										GOLFPROC
Golfingia vulgaris								+	+										+		+	+				GOLFVULG
Golfingia spec. juv.																										GOLFJUVE
Goniada maculata	+	+	+	+	+	+	+	+		+	+		+	+				+	+	+	+			+	+	GONIMACU
Goodallia triangularis											+															GOODTRIAN
Gyptis capensis	+				+						+	+	+		+		+	+			+		+		+	GYPTCAPE
Harmothoe glabra																										HARMGLAB
Harmothoe imbricata												+														HARMIMBR
Harmothoe sarsi sarsi								+																		HARMSARS
Harmothoe spec. juv.	+	+	+	+		+	+	+			+													+		HARMJUVE
Harpinia antennaria						+		+	+	+		+	+	+	+	+	+	+	+		+	+	+	+		HARPANTE
Heteromastus filiformis																										HETEFILI
Hippomedon denticulatus				+																+						HIPPDENT
Hyala vitrea									+			+		+		+		+	+		+					HYALVITR
Ione thoracica								+	+			+				+	+	+	+			+				IONETHOR
Iphinoe trispinosa															+											IPHITRIS
Labidoplax buski												+														LABIBUSK
Lagisca extenuata																										LAGIEXTE
Lanice conchilega		+											+								+					LANICONC

Appendix-1 Biomonitoring 2002 (+ = presence)

	Dogger Bank							Oyster Ground																	
	DoG	DoG	DoG	DoG	DoG	DoG	DoG	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	
	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**
Lepton squamosum																		+								LEPTSQUA
Leptosynapta inhaerens																										LEPTOINHA
Leucothoe incisa		+			+	+									+	+		+								LEUCINCI
Liocarcinus spec. juv.																										LIOCSPEC
Lucinoma borealis													+													LUCIJUVE
Lumbrineris fragilis																										LUMBFRAG
Lumbrineris latreilli																										LUMBLATR
Lutraria lutraria																										LUTRALUT
Lysilla loveni										+								+								LYSILOVE
Macoma balthica																										MACOBALT
Mactra corallina						+																				MACTCORA
Magelona alleni					+		+				+					+	+				+				+	MAGEALLE
Magelona johnstoni	+	+	+	+	+	+	+		+		+		+			+	+			+				+	+	MAGEJOHN
Magelona mirabilis		+	+	+		+		+	+		+	+	+		+	+							+	+	+	MAGEMIRA
Malmgreniella lunulata																										MALMLUNU
Mangelia nebula											+															MANGNEBU
Mediomastus fragilis							+		+					+	+			+	+							MEDIFRAG
Megaluropus agilis	+		+	+			+																			MEGAAGIL
Modiolus spec. juv.																										MODIJUVE
Molgula oculata juv.																										MOLGOCUL
Mya truncata										+				+					+							MYATRUNC
Myriochele oculata												+		+	+	+		+	+							MYRIOCUL
Mysella bidentata	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	MYSEBIDE
Mysia undata								+						+					+							MYSIUNDA
Nebalia bipes																										NEBABIPE
Nematoda																										NEMATODA
Nemertini	+	+				+	+	+	+	+	+	+	+		+	+		+	+	+	+		+	+	+	NEMERTIN
Nephtys assimilis																				+						NEPHASSI
Nephtys caeca					+	+					+															NEPHCAEC
Nephtys cirrosa	+	+				+	+			+					+									+	+	NEPHCIRR
Nephtys hombergii		+		+	+	+		+	+	+		+	+	+			+		+		+	+	+			NEPHHOMB
Nephtys incisa												+							+							NEPHINCI
Nephtys longosetosa					+										+											NEPHLONG
Nephtys spec. juv.		+	+	+	+		+	+			+		+			+										NEPHJUVE
Nereis longissima												+	+		+			+								NERELONG
Notomastus latericeus		+	+	+	+					+	+			+	+			+			+	+			+	NOTOLATE
Nucula nitidosa								+			+	+	+	+	+	+	+	+	+	+	+		+	+		NUCUNITI
Nucula tenuis										+							+									NUCUTENU
Oligochaeta									+																	OLIGOCHA
Ondina divisa																										ONDIDIVI
Ophelia limacina			+			+																				OPHELIMA
Ophelina acuminata																		+								OPHEACUM
Ophiodromus flexuosus								+	+	+				+		+	+	+	+		+				+	OPHIFLEX
Ophiura albida									+						+			+								OPHIALBI
Ophiura texturata																										OPHITEXT
Ophiura spec. juv.													+													OPHIJUVE
Orbinia sertulata												+									+					ORBISERT
Orchomene nana				+																						ORCHNANA
Orchomene spec. juv.																+										ORCHJUVE
Owenia fusiformis		+				+	+		+	+	+			+												OWENFUSI
Paraonis fulgens														+					+		+					PARAFULG

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Pectinaria auricoma										+	+			+					+		+	+				PECTAURI
Pectinaria koreni								+													+					PECTKORE
Perioculodes longimanus	+	+		+		+	+																			PERILONG
Phaxas pellucidus													+	+			+									PHAXAPEL
Pholoe minuta		+					+	+		+		+	+	+	+		+			+			+			PHOLMINU
Phoronida		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PHORONID
Phyllodoce groenlandica																										PHYLGROE
Phyllodoce lineata																										PHYLLINE
Phyllodoce rosea							+					+									+					PHYLROSE
Phyllodocidae spec.		+			+				+				+													PHYLSPEC
Podarkeopsis helgolandica		+																								PODAHELG
Poecilochaetus serpens		+																					+		+	POECSERP
Polycirrus medusa																										POLYMEDU
Polydora ciliata																		+								POLYCILI
Polydora spec.																										POLYSPEC
Polydora spec. juv.															+											POLYJUVE
Polynoe kinbergi										+								+								POLYKINB
Polyplacophora																										POLYPLAC
Pontocrates altamarinus	+												+		+	+			+							PONTALTA
Pontophilus trispinosus																										PONTTRIS
Prionospio cirrifera																										PRIOCIRR
Processa nouveli holthuisi															+											PROCNOHO
Processa spec.																										PROCSPEC
Pseudocuma longicornis	+	+	+	+	+			+		+					+	+	+		+							PSEULONG
Retusa umbilicata																						+				RETUUMBI
Rhodine loveni														+												RHODLOVE
Scalibregma inflatum																+										SCALINFL
Scaphander lignarius			+							+																SCAPHLIG
Scolelepis bonnieri																										SCOLBONN
Scolelepis foliosa																										SCOLFOLI
Scolelepis squamata																										SCOLSQUA
Scoloplos armiger	+				+			+			+		+				+							+		SCOLARMI
Semierycina nitida															+		+	+				+				SEMINITI
Sigalion mathildae		+			+		+				+					+								+		SIGAMATH
Sigalion mathildae juv.											+															SIGAMAJU
Siphonoecetus kroyeranus	+		+	+	+	+																				SIPHKROY
Sipunculidae spec.				+																						SIPUSPEC
Sphenia binghami																										SPHEBING
Spio filicornis		+	+	+	+	+	+	+				+	+	+			+		+		+	+	+			SPIOFILI
Spiophanes bombyx	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+		+					+	SPIOBOMB
Spiophanes kroeyeri																								+		SPIOKROE
Spisula elliptica																									+	SPISELLI
Spisula solida																										SPISSOLI
Spisula subtruncata		+																								SPISSUBT
Spisula spec. juv.																										SPISJUVE
Sthenelais boa			+																							STHENBOA
Sthenelais limicola		+		+				+		+				+			+			+	+	+		+		STHELIMI
Syllidae spec.																										SYLLIDAE
Syllis gracilis																										SYLLGRAC
Synchelidium maculatum					+	+	+				+	+	+													SYNCMACU
Synelmis klatti								+		+			+	+		+	+		+		+	+	+	+	+	SYNEKLAT

Appendix-1 Biomonitoring 2002 (+ = 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**
Tellimya ferruginosa							+	+			+									+	+		+		TELLFERR
Tellimya tenella										+															TELLTENE
Tellina fabula	+	+	+	+	+	+	+			+	+		+											+	TELLFABU
Tellina pygmea																									TELLPYGM
Tellina tenuis																									TELLTENU
Terebellidae spec. juv.																									TEREJUVE
Terebellides stroemi														+							+	+			TERESTRO
Tharyx killariensis																					+				THARKILL
Thia scutellata																									THIASCUT
Thracia convexa																	+								THRACONV
Thracia phaseolina	+	+			+		+				+				+	+								+	+	THRAPHAS
Thyasira flexuosa					+			+		+	+									+					THYAFLEX
Tornus subcarinatus																									TORNSUBC
Travisia forbesii																									TRAVFORB
Turbellaria spec.								+		+	+			+	+		+					+		+	TURBELLA
Turbonilla pusilla																									TURBPUSI
Turritella communis																									TURRCOMM
Upogebia deltaura												+			+			+							UPOGDELT
Upogebia deltaura juv.																		+							UPOGJUVE
Upogebia stellata																						+			UPOGSTEL
Urothoe brevicornis						+	+																		UROTBREV
Urothoe poseidonis	+	+	+	+	+	+	+								+	+								+	UROTPOSE
Vitreolina antiflexa			+														+								VITRANTI

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Abra alba		+				+	+				+	+	+				+			+					ABRAALBA
Abra nitida	+																						+		ABRANITI
Abra prismatica											+						+						+		ABRAPRIS
Acanthocardia echinata																									ACANECHI
Acanthocardia spec. juv.					+																				ACANJUVE
Acrocnida brachiata																									ACROBRAC
Alvania lactea																									ALVALACT
Ampelisca brevicornis									+								+	+		+	+				AMPEBREV
Ampelisca tenuicornis		+					+	+			+		+		+				+				+		AMPETENU
Ampharete acutifrons																+									AMPHACUT
Ampharete finmarchica								+																	AMPHFINM
Ampharete spec.																									AMPHSPEC
Amphioxus lanceolatus															+				+						AMPHLANC
Amphiura chiajei																							+		AMPHCHIA
Amphiura filiformis	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	AMPHFILI
Amphiura spec. juv																									AMPHJUVE
Anthozoa spec.											+								+						ANTHOZOA
Aonides paucibranchiata			+																						AONIPAUC
Aphelochaeta marioni															+						+				APHEMARI
Apherusa ovalipes																						+			APHEOVAL
Aphrodite aculeata						+																+			APHRACUL
Arca lactea																									ARCALACT
Aplacophora																					+				APLACOPH
Argissa hamatipes				+						+			+												ARGISHAMA
Aricidea minuta																									ARICMINU
Asterias rubens																									ASTERUBE
Atylus falcatus																									ATYLFALC
Atylus swammerdami						+																			ATYLSWAM
Bathyporeia elegans					+	+				+	+						+			+		+	+		BATHELEG
Bathyporeia guilliamsoniana				+	+				+	+	+		+				+			+			+	+	BATHGUIL
Bivalve indet.																									BIVAINDE
Bopyrus squillarum			+																						BOPYSQUIL
Brissopsis lyrifera		+													+										BRISLYRI
Callianassa subterranea juv.	+	+	+			+		+		+		+	+	+			+	+	+	+					CALLJUVE
Callianassa subterranea	+	+	+	+	+	+		+		+		+	+	+	+	+	+	+	+	+		+			CALLSUBT
Callianassa tyrrhena																									CALLTYRR
Capitella capitata														+											CAPICAPI
Caprellidae spec.																						+			CAPRELLI
Carcinus maenas																									CARCMAEN
Chaetopterus variopedatus									+					+	+		+		+						CHAEVARI
Chaetozone setosa	+	+		+	+		+		+	+					+						+	+	+	+	CHAESETO
Chamelea striatula		+									+		+							+		+		+	CHAMSTRI
Chone duneri																									CHONDUNE
Cirolana borealis	+												+												CIROBORE
Corbula gibba	+		+	+			+	+	+		+		+	+	+	+	+	+	+		+	+		+	CORBGIBB
Corophium affine																									COROAFFI
Corystes cassivelaunus			+		+																				CORYCASS
Corystes cassivelaunus juv.																									CORYJUVE
Cylichna cylindracea	+		+		+		+			+			+	+	+		+		+		+		+		CYLICYLI
Diastylis bradyi									+	+		+	+	+	+	+		+							DIASBRAD
Diogenes pugilator						+																			DIOGPUGI

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Diplocirrus glaucus	+		+	+	+	+		+		+	+		+		+			+			+		+		DIPLGLAU
Diplodonta rotundata																									DIPLOROT
Donax vittatus																								+	DONAVITT
Dosinia lupinus		+								+							+						+	+	DOSILUPI
Dyopedos monacanthus																									DYOPMONA
Ebalia cranchii																							+		EBALCRAN
Ebalia spec.juv.																									EBALJUVE
Ebalia tumefacta		+			+																				EBALTUME
Echinocardium cordatum	+	+				+	+		+	+	+	+								+					ECHICORD
Echinocyamus pusillus																									ECHIPUSI
Edwardsia claparedii									+																EDWACLAP
Ensis directus																									ENSIDIRE
Ensis arcuatus																									ENSIARCU
Ensis ensis										·															ENSIENSI
Eteone barbata																									ETEOBARB
Eteone longa										+												+			ETEOLONG
Eudorella truncatula	+	+					+	+				+	+			+	+	+	+	+					EUDOTRUN
Eudorellopsis deformis										+													+		EUDODEFO
Eumida sanguinea										+															EUMISANG
Eurydice spinigera																									EURYSPIN
Euspira nitida		+	+			+			+			+		+		+	+	+		+		+	+	+	EUSPNITI
Euzonus flabelligerus																									EUZOFLAB
Exogone hebes									+								+								EXOGHEBE
Gari costulata																									GARICOST
Gari fervensis																									GARIFERV
Gattyana cirrosa									+					+	+		+		+						GATTCIRR
Glycera alba								+						+											GLYCALBA
Glycera lapidum													+					+							GLYCLAPI
Glycera rouxi		+																							GLYCROUX
Glycera spec. juv.	+													+			+								GLYCJUVE
Glycinde nordmanni																									GLYCNORD
Golfingia elongata			+					+																	GOLFELON
Golfingia procera																		+	+						GOLFPROC
Golfingia vulgaris									+					+	+				+						GOLFVULG
Golfingia spec. juv.																					+				GOLFJUVE
Goniada maculata			+		+	+				+	+	+	+			+		+	+	+		+	+	+	GONIMACU
Goodallia triangularis																								+	GOODTRIAN
Gyptis capensis				+		+	+	+					+	+		+		+		+					GYPTCAPE
Harmothoe glabra						+																			HARMGLAB
Harmothoe imbricata																									HARMIMBR
Harmothoe sarsi sarsi																									HARMSARS
Harmothoe spec. juv.		+																					+		HARMJUVE
Harpinia antennaria	+	+	+		+	+		+	+	+		+	+	+	+	+	+	+			+	+	+		HARPANTE
Heteromastus filiformis																									HETEFILI
Hippomedon denticulatus																							+		HIPPDENT
Hyala vitrea	+	+					+	+	+						+			+	+						HYALVITR
Ione thoracica	+			+		+		+						+	+	+		+		+					IONETHOR
Iphinoe trispinosa																									IPHITRIS
Labidoplax buski																									LABIBUSK
Lagisca extenuata																									LAGIEXTE
Lanice conchilega				+																+			+		LANICONC

Appendix-1 Biomonitoring 2002 (+ = 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	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**
Lepton squamosum			+																							LEPTSQUA
Leptosynapta inhaerens													+						+							LEPTOINHA
Leucothoe incisa			+							+							+		+							LEUCINCI
Liocarcinus spec. juv.						+																				LIOCSPEC
Lucinoma borealis					+																		+			LUCIJUVE
Lumbrineris fragilis								+										+								LUMBFRAG
Lumbrineris latreilli		+	+			+		+				+		+		+		+								LUMBLATR
Lutraria lutraria						+																				LUTRALUT
Lysilla loveni						+																				LYSILOVE
Macoma balthica																										MACOBALT
Mactra corallina			+																							MACTCORA
Magelona alleni		+		+						+	+												+			MAGEALLE
Magelona johnstoni			+	+					+	++	+	+	+				+			+		+	+	+		MAGEJOHN
Magelona mirabilis		+		+	+				+	+	+		+				+					+	+	+		MAGEMIRA
Malmgreniella lunulata					+														+							MALMLUNU
Mangelia nebula																										MANGNEBU
Mediomastus fragilis			+			+						+	+	+		+		+		+	+					MEDIFRAG
Megaluropus agilis											+															MEGAAGIL
Modiolus spec. juv.																										MODIJUVE
Molgula oculata juv.																										MOLGOCUL
Mya truncata																										MYATRUNC
Myriochele oculata			+					+				+						+	+							MYRIOCUL
Mysella bidentata	+	+	+	+	+	+	+	+	+		+	+	+		+		+		+	+	+	+	+			MYSEBIDE
Mysia undata					+			+			+		+	+					+				+			MYSIUNDA
Nebalia bipes														+												NEBABIPE
Nematoda																										NEMATODA
Nemertini	+	+		+	+	+	+		+	+	+	+	+	+	+	+	+	+	+		+		+	+		NEMERTIN
Nephtys assimilis																					+	+				NEPHASSI
Nephtys caeca				+	+	+													+							NEPHCAEC
Nephtys cirrosa															+		+								+	NEPHCIRR
Nephtys hombergii	+	+	+		+		+				+	+	+	+	+	+	+		+	+	+	+				NEPHHOMB
Nephtys incisa			+					+								+		+	+							NEPHINCI
Nephtys longosetosa																										NEPHLONG
Nephtys spec. juv.		+			+	+	+					+				+	+			+		+	+	+		NEPHJUVE
Nereis longissima		+	+	+					+					+	+	+		+	+							NERELONG
Notomastus latericeus		+	+			+		+			+			+		+		+	+							NOTOLATE
Nucula nitidosa	+	+	+	+	+	+	+		+	+	+	+	+	+		+	+	+		+	+	+	+			NUCUNITI
Nucula tenuis																										NUCUTENU
Oligochaeta																										OLIGOCHA
Ondina divisa			+															+								ONDIDIVI
Ophelia limacina																										OPHELIMA
Ophelina acuminata																										OPHEACUM
Ophiodromus flexuosus		+	+	+	+			+		+	+		+	+	+	+	+		+	+		+	+			OPHIFLEX
Ophiura albida			+			+		+				+						+					+			OPHIALBI
Ophiura texturata																										OPHITEXT
Ophiura spec. juv.									+	+				+												OPHIJUVE
Orbinia sertulata																										ORBISERT
Orchomene nana		+								+							+			+				+	ORCHNANA
Orchomene spec. juv.																										ORCHJUVE
Owenia fusiformis						+											+									OWENFUSI
Paraonis fulgens																			+							PARAFULG

Appendix-1 Biomonitoring 2002 (+ = 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
	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**
Pectinaria auricoma		+											+	+	+										PECTAURI
Pectinaria koreni				+					+						+				+						PECTKORE
Perioculodes longimanus			+		+					+			+							+		+		PERILONG
Phaxas pellucidus	+			+	+										+							+	+	+	PHAXAPEL
Pholoe minuta	+	+		+	+			+				+	+		+		+		+	+	+	+	+		PHOLMINU
Phoronida	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PHORONID
Phyllodoce groenlandica			+					+				+	+					+							PHYLGROE
Phyllodoce lineata																									PHYLLINE
Phyllodoce rosea								+			+						+						+		PHYLROSE
Phyllodocidae spec.													+												PHYLSPEC
Podarkeopsis helgolandica																									PODAHELG
Poecilochaetus serpens		+							+	+	+		+			+	+			+			+		POECSERP
Polycirrus medusa															+										POLYMEDU
Polydora ciliata		+	+															+							POLYCILI
Polydora spec.																					+				POLYSPEC
Polydora spec. juv.																									POLYJUVE
Polynoe kinbergi						+																			POLYKINB
Polyplacophora																									POLYPLAC
Pontocrates altamarinus																									PONTALTA
Pontophilus trispinosus																									PONTTRIS
Prionospio cirrifera																+									PRIOCIRR
Processa nouveli holthuisi												+													PROCNOHO
Processa spec.																									PROCSPEC
Pseudocuma longicornis				+						+							+					+	+	+	PSEULONG
Retusa umbilicata																									RETUUMBI
Rhodine loveni																									RHODLOVE
Scalibregma inflatum						+				+		+	+		+		+			+			+		SCALINFL
Scaphander lignarius																									SCAPHLIG
Scolelepis bonnieri																									SCOLBONN
Scolelepis foliosa																									SCOLFOLI
Scolelepis squamata																									SCOLSQUA
Scoloplos armiger	+			+	+					+	+						+				+	+	+		SCOLARMI
Semierycina nitida																					+				SEMINITI
Sigalion mathildae				+		+				+	+												+		SIGAMATH
Sigalion mathildae juv.																									SIGAMAJU
Siphonoecetus kroyeranus														+										+	SIPHKROY
Sipunculidae spec.																									SIPUSPEC
Sphenia binghami																									SPHEBING
Spio filicornis	+	+			+		+	+					+		+				+		+			+	SPIOFILI
Spiophanes bombyx				+	+	+		+		+	+	+	+		+	+	+	+	+	+	+	+	+	+	SPIOBOMB
Spiophanes kroeyeri							+								+		+				+				SPIOKROE
Spisula elliptica										+										+			+		SPISELLI
Spisula solida																									SPISSOLI
Spisula subtruncata																									SPISSUBT
Spisula spec. juv.																									SPISJUVE
Sthenelais boa																									STHENBOA
Sthenelais limicola				+		+	+		+	+	+		+		+	+	+				+	+	+		STHELIMI
Syllidae spec.																									SYLLIDAE
Syllis gracilis																									SYLLGRAC
Synchelidium maculatum																									SYNCMACU
Synelmis klatti	+	+		+				+		+			+		+		+		+			+			SYNEKLAT

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Tellimya ferruginosa		+				+	+		+	+	+	+								+				+	TELLFERR
Tellimya tenella		+													+										TELLTENE
Tellina fabula					+	+				+		+								+			+	+	TELLFABU
Tellina pygmea																									TELLPYGM
Tellina tenuis					+																				TELLTENU
Terebellidae spec. juv.																									TEREJUVE
Terebellides stroemi								+																	TERESTRO
Tharyx killariensis																									THARKILL
Thia scutellata																									THIASCUT
Thracia convexa												+													THRACONV
Thracia phaseolina					+					+	+		+				+				+		+	+	THRAPHAS
Thyasira flexuosa	+			+	+						+										+		+		THYAFLEX
Tornus subcarinatus																									TORNSUBC
Travisia forbesii																									TRAVFORB
Turbellaria spec.		+						+	+			+	+		+		+	+			+				TURBELLA
Turbonilla pusilla																									TURBPUSI
Turritella communis													+	+	+			+	+		+				TURRCOMM
Upogebia deltaura			+			+							+					+	+						UPOGDELT
Upogebia deltaura juv.			+													+									UPOGJUVE
Upogebia stellata																									UPOGSTEL
Urothoe brevicornis																								+	UROTBREV
Urothoe poseidonis		+			+				+	+			+											+	UROTPOSE
Vitreolina antiflexa																							+		VITRANTI

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Abra alba	+																										ABRAALBA
Abra nitida																											ABRANITI
Abra prismatica												+															ABRAPRIS
Acanthocardia echinata																											ACANECHI
Acanthocardia spec. juv.																											ACANJUVE
Acrocnida brachiata				+																							ACROBRAC
Alvania lactea																											ALVALACT
Ampelisca brevicornis																											AMPEBREV
Ampelisca tenuicornis																											AMPETENU
Ampharete acutifrons																											AMPHACUT
Ampharete finmarchica																											AMPHFINM
Ampharete spec.																											AMPHSPEC
Amphioxus lanceolatus							+								+												AMPHLANC
Amphiura chiajei																											AMPHCHIA
Amphiura filiformis																											AMPHFILI
Amphiura spec. juv																											AMPHJUVE
Anthozoa spec.				+																+							ANTHOZOA
Aonides paucibranchiata																+	+	+	+	+				+		+	AONIPAUC
Aphelochaeta marioni								+																			APHEMARI
Apherusa ovalipes																											APHEOVAL
Aphrodite aculeata																											APHRACUL
Arca lactea																											ARCALACT
Aplacophora																											APLACOPH
Argissa hamatipes																											ARGISHAMA
Aricidea minuta												+	+	+	+	+	+		+	+		+			+		ARICMINU
Asterias rubens																											ASTERUBE
Atylus falcatus			+												+												ATYLFALC
Atylus swammerdami												+								+	+						ATYLSWAM
Bathyporeia elegans	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+			+				+				BATHELEG
Bathyporeia guilliamsoniana	+	+		+	+	+	+	+	+	+	+			+											+		BATHGUIL
Bivalve indet.																											BIVAINDE
Bopyrus squillarum																											BOPYSQUIL
Brissopsis lyrifera																											BRISLYRI
Callianassa subterranea juv.																											CALLJUVE
Callianassa subterranea	+																										CALLSUBT
Callianassa tyrrhena																							+				CALLTYRR
Capitella capitata																											CAPICAPI
Caprellidae spec.		+	+	+																							CAPRELLI
Carcinus maenas						+																					CARCMAEN
Chaetopterus variopedatus																											CHAEVARI
Chaetozone setosa	+	+	+		+		+	+	+				+	+	+	+											CHAESETO
Chamelea striatula							+																				CHAMSTRI
Chone duneri																											CHONDUNE
Cirolana borealis																											CIROBORE
Corbula gibba	+			+																							CORBGIBB
Corophium affine																											COROAFFI
Corystes cassivelaunus																											CORYCASS
Corystes cassivelaunus juv.																											CORYJUVE
Cylichna cylindracea	+			+	+																						CYLICYLI
Diastylis bradyi					+				+	+		+	+														DIASBRAD
Diogenes pugilator																											DIOGPUGI

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area																									
	Off 1	Off 2	Off 3	Off 4	Off 5	Off 6	Off 7	Off 8	Off 9	Off 10	Off 11	Off 12	Off 13	Off 14	Off 15	Off 16	Off 17	Off 18	Off 19	Off 20	Off 21	Off 22	Off 23	Off 24	Off 25	Off 26	
Species name																											**Code**
Diplocirrus glaucus																											DIPLGLAU
Diplodonta rotundata																											DIPLOROT
Donax vittatus		+					+	+	+			+	+	+	+	+	+			+							DONAVITT
Dosinia lupinus																											DOSILUPI
Dyopedos monacanthus																+											DYOPMONA
Ebalia cranchii																											EBALCRAN
Ebalia spec.juv.																											EBALJUVE
Ebalia tumefacta																											EBALTUME
Echinocardium cordatum		+	+	+	+		+	+	+	+	+	+	+	+		+				+		+	+		+		ECHICORD
Echinocyamus pusillus	+					+																				+	ECHIPUSI
Edwardsia claparedii	+																										EDWACLAP
Ensis directus	+																										ENSIDIRE
Ensis arcuatus																							+				ENSIARCU
Ensis ensis																											ENSIENSI
Eteone barbata																											ETEOBARB
Eteone longa		+		+		+	+	+	+													+	+		+		ETEOLONG
Eudorella truncatula																											EUDOTRUN
Eudorellopsis deformis																											EUDODEFO
Eumida sanguinea	+	+	+							+																	EUMISANG
Eurydice spinigera																		+			+						EURYSPIN
Euspira nitida			+	+	+	+	+	+	+	+	+	+		+	+			+			+	+			+		EUSPNITI
Euzonus flabelligerus																											EUZOFLAB
Exogone hebes																											EXOGHEBE
Gari costulata																											GARICOST
Gari fervensis																											GARIFERV
Gattyana cirrosa																											GATTCIRR
Glycera alba																											GLYCALBA
Glycera lapidum																											GLYCLAPI
Glycera rouxi																											GLYCROUX
Glycera spec. juv.																											GLYCJUVE
Glycinde nordmanni																											GLYCNORD
Golfingia elongata																											GOLFELON
Golfingia procera																											GOLFPROC
Golfingia vulgaris																											GOLFVULG
Golfingia spec. juv.																											GOLFJUVE
Goniada maculata		+		+				+			+	+	+	+													GONIMACU
Goodallia triangularis						+																					GOODTRIAN
Gyptis capensis	+	+	+	+	+																						GYPTCAPE
Harmothoe glabra																											HARMGLAB
Harmothoe imbricata																											HARMIMBR
Harmothoe sarsi sarsi																											HARMSARS
Harmothoe spec. juv.	+		+		+							+		+	+			+	+	+							HARMJUVE
Harpinia antennaria																											HARPANTE
Heteromastus filiformis						+																				+	HETEFILI
Hippomedon denticulatus											+																HIPPDENT
Hyala vitrea																											HYALVITR
Ione thoracica																											IONETHOR
Iphinoe trispinosa					+					+																	IPHITRIS
Labidoplax buski																											LABIBUSK
Lagisca extenuata													+														LAGIEXTE
Lanice conchilega	+		+		+		+	+		+		+											+				LANICONC

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area																									
	Off 1	Off 2	Off 3	Off 4	Off 5	Off 6	Off 7	Off 8	Off 9	Off 10	Off 11	Off 12	Off 13	Off 14	Off 15	Off 16	Off 17	Off 18	Off 19	Off 20	Off 21	Off 22	Off 23	Off 24	Off 25	Off 26	
Species name																											**Code**
Lepton squamosum																											LEPTSQUA
Leptosynapta inhaerens																											LEPTOINHA
Leucothoe incisa	+		+		+			+		+													+				LEUCINCI
Liocarcinus spec. juv.																											LIOCSPEC
Lucinoma borealis																											LUCIJUVE
Lumbrineris fragilis																											LUMBFRAG
Lumbrineris latreilli																											LUMBLATR
Lutraria lutraria																											LUTRALUT
Lysilla loveni																											LYSILOVE
Macoma balthica			+																								MACOBALT
Mactra corallina																											MACTCORA
Magelona alleni																							+				MAGEALLE
Magelona johnstoni	+	++	+	+	+		+	+		+	+	+	+	+		+			+	+						+	MAGEJOHN
Magelona mirabilis	+	+	+	+	+	+	+	+	+	+	+				+			+	+								MAGEMIRA
Malmgreniella lunulata	+		+																								MALMLUNU
Mangelia nebula																											MANGNEBU
Mediomastus fragilis																											MEDIFRAG
Megaluropus agilis						+	+	+	+	+			+		+		+		+	+	+	+	+		+		MEGAAGIL
Modiolus spec. juv.																											MODIJUVE
Molgula oculata juv.																											MOLGOCUL
Mya truncata																											MYATRUNC
Myriochele oculata																											MYRIOCUL
Mysella bidentata	+		+		+																						MYSEBIDE
Mysia undata																											MYSIUNDA
Nebalia bipes																											NEBABIPE
Nematoda						+	+						+								+				+		NEMATODA
Nemertini	+	+	+	+	+	+	+	+	+		+		+		+								+		+	+	NEMERTIN
Nephtys assimilis	+				+			+																			NEPHASSI
Nephtys caeca																											NEPHCAEC
Nephtys cirrosa		+		+		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NEPHCIRR
Nephtys hombergii		+		+																							NEPHHOMB
Nephtys incisa																											NEPHINCI
Nephtys longosetosa																											NEPHLONG
Nephtys spec. juv.		+	+			+																+					NEPHJUVE
Nereis longissima	+						+																				NERELONG
Notomastus latericeus	+			+																							NOTOLATE
Nucula nitidosa	+			+							+																NUCUNITI
Nucula tenuis																											NUCUTENU
Oligochaeta																											OLIGOCHA
Ondina divisa																											ONDIDIVI
Ophelia limacina						+			+				+					+									OPHELIMA
Ophelina acuminata																											OPHEACUM
Ophiodromus flexuosus																											OPHIFLEX
Ophiura albida			+	+							+				+												OPHIALBI
Ophiura texturata		+	+						+																		OPHITEXT
Ophiura spec. juv.	+				+		+														+						OPHIJUVE
Orbinia sertulata																											ORBISERT
Orchomene nana				+			+	+																			ORCHNANA
Orchomene spec. juv.																											ORCHJUVE
Owenia fusiformis				+																							OWENFUSI
Paraonis fulgens						+											+	+									PARAFULG

Appendix-1 Biomonitoring 2002 (+ = 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	
	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**
Pectinaria auricoma																											PECTAURI
Pectinaria koreni																											PECTKORE
Perioculodes longimanus				+	+				+										+								PERILONG
Phaxas pellucidus			+																								PHAXAPEL
Pholoe minuta	+																										PHOLMINU
Phoronida	+		+	+	+	+		+			+									+	+	+	+				PHORONID
Phyllodoce groenlandica																							+				PHYLGROE
Phyllodoce lineata								+																			PHYLLINE
Phyllodoce rosea																	+										PHYLROSE
Phyllodocidae spec.																											PHYLSPEC
Podarkeopsis helgolandica																											PODAHELG
Poecilochaetus serpens	+	+			+		+	+																	+		POECSERP
Polycirrus medusa																											POLYMEDU
Polydora ciliata																											POLYCILI
Polydora spec.																											POLYSPEC
Polydora spec. juv.																											POLYJUVE
Polynoe kinbergi																											POLYKINB
Polyplacophora																											POLYPLAC
Pontocrates altamarinus																											PONTALTA
Pontophilus trispinosus																						+					PONTTRIS
Prionospio cirrifera																											PRIOCIRR
Processa nouveli holthuisi																											PROCNOHO
Processa spec.																											PROCSPEC
Pseudocuma longicornis		+			+	+	+		+	+		+		+	+	+	+	+	+			+	+		+		PSEULONG
Retusa umbilicata																											RETUUMBI
Rhodine loveni																											RHODLOVE
Scalibregma inflatum																											SCALINFL
Scaphander lignarius																											SCAPHLIG
Scolelepis bonnieri		+			+						+			+											+	+	SCOLBONN
Scolelepis foliosa														+													SCOLFOLI
Scolelepis squamata																	+		+	+	+						SCOLSQUA
Scoloplos armiger	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						+	+				SCOLARMI
Semierycina nitida																											SEMINITI
Sigalion mathildae		+		+	+																						SIGAMATH
Sigalion mathildae juv.																											SIGAMAJU
Siphonoecetus kroyeranus	+			+	+						+																SIPHKROY
Sipunculidae spec.																											SIPUSPEC
Sphenia binghami																											SPHEBING
Spio filicornis	+	+	+		+	+	+	+		+										+							SPIOFILI
Spiophanes bombyx	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+							SPIOBOMB
Spiophanes kroeyeri															+												SPIOKROE
Spisula elliptica																		+									SPISELLI
Spisula solida																											SPISSOLI
Spisula subtruncata																											SPISSUBT
Spisula spec. juv.																							+				SPISJUVE
Sthenelais boa																											STHENBOA
Sthenelais limicola				+																							STHELIMI
Syllidae spec.																											SYLLIDAE
Syllis gracilis																					+						SYLLGRAC
Synchelidium maculatum	+		+		+				+	+				+													SYNCMACU
Synelmis klatti																											SYNEKLAT

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area																									
	Off 1	Off 2	Off 3	Off 4	Off 5	Off 6	Off 7	Off 8	Off 9	Off 10	Off 11	Off 12	Off 13	Off 14	Off 15	Off 16	Off 17	Off 18	Off 19	Off 20	Off 21	Off 22	Off 23	Off 24	Off 25	Off 26	
Species name																											**Code**
Tellimya ferruginosa	+	+	+	+	+		+	+		+			+		+	+			+								TELLFERR
Tellimya tenella																											TELLTENE
Tellina fabula	+	+	+	+	+		+	+		+	+	+	+	+	+												TELLFABU
Tellina pygmea																					+						TELLPYGM
Tellina tenuis																											TELLTENU
Terebellidae spec. juv.																		+									TEREJUVE
Terebellides stroemi																											TERESTRO
Tharyx killariensis																											THARKILL
Thia scutellata			+						+										+	+							THIASCUT
Thracia convexa																											THRACONV
Thracia phaseolina	+			+	+																						THRAPHAS
Thyasira flexuosa																											THYAFLEX
Tornus subcarinatus																											TORNSUBC
Travisia forbesii																											TRAVFORB
Turbellaria spec.																											TURBELLA
Turbonilla pusilla		+																									TURBPUSI
Turritella communis																											TURRCOMM
Upogebia deltaura																											UPOGDELT
Upogebia deltaura juv.																											UPOGJUVE
Upogebia stellata																											UPOGSTEL
Urothoe brevicornis		+	+			+	+	+	+	+		+			+	+		+					+				UROTBREV
Urothoe poseidonis	+	+	+		+	+	+	+	+	+		+	+	+	+	+			+	+	+	+	+	+	+		UROTPOSE
Vitreolina antiflexa																											VITRANTI

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area										Coastal area															
	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**
Abra alba																										ABRAALBA
Abra nitida																										ABRANITI
Abra prismatica																										ABRAPRIS
Acanthocardia echinata																										ACANECHI
Acanthocardia spec. juv.																										ACANJUVE
Acrocnida brachiata																										ACROBRAC
Alvania lactea							+																			ALVALACT
Ampelisca brevicornis																										AMPEBREV
Ampelisca tenuicornis																										AMPETENU
Ampharete acutifrons																										AMPHACUT
Ampharete finmarchica																										AMPHFINM
Ampharete spec.																										AMPHSPEC
Amphioxus lanceolatus	+						+																			AMPHLANC
Amphiura chiajei																										AMPHCHIA
Amphiura filiformis							+																			AMPHFILI
Amphiura spec. juv														+	+						+					AMPHJUVE
Anthozoa spec.				+			+						+	+		+			+							ANTHOZOA
Aonides paucibranchiata																										AONIPAUC
Aphelochaeta marioni								+																		APHEMARI
Apherusa ovalipes																										APHEOVAL
Aphrodite aculeata																										APHRACUL
Arca lactea							+																			ARCALACT
Aplacophora																										APLACOPH
Argissa hamatipes																										ARGISHAMA
Aricidea minuta					+	+		+	+																	ARICMINU
Asterias rubens																										ASTERUBE
Atylus falcatus			+						+		+											+				ATYLFALC
Atylus swammerdami									+			+			+										+	ATYLSWAM
Bathyporeia elegans			+	+	+	+	+	+			+				+	+									+	BATHELEG
Bathyporeia guilliamsoniana			+	+	+	+	+		+	+					+			+			+				+	BATHGUIL
Bivalve indet.														+												BIVAINDE
Bopyrus squillarum																										BOPYSQUIL
Brissopsis lyrifera																										BRISLYRI
Callianassa subterranea juv.																										CALLJUVE
Callianassa subterranea																										CALLSUBT
Callianassa tyrrhena	+					+	+		+																	CALLTYRR
Capitella capitata															+			+		+					+	CAPICAPI
Caprellidae spec.																										CAPRELLI
Carcinus maenas																									+	CARCMAEN
Chaetopterus variopedatus																										CHAEVARI
Chaetozone setosa			+		+		+	+			+							+								CHAESETO
Chamelea striatula																										CHAMSTRI
Chone duneri																										CHONDUNE
Cirolana borealis																										CIROBORE
Corbula gibba																										CORBGIBB
Corophium affine																										COROAFFI
Corystes cassivelaunus																										CORYCASS
Corystes cassivelaunus juv.																										CORYJUVE
Cylichna cylindracea																										CYLICYLI
Diastylis bradyi						+			+							+										DIASBRAD
Diogenes pugilator												+			+					+						DIOGPUGI

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area										Coastal area															
	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**
Diplocirrus glaucus																										DIPLGLAU
Diplodonta rotundata							+																			DIPLOROT
Donax vittatus					+			+							+			+								DONAVITT
Dosinia lupinus																										DOSILUPI
Dyopedos monacanthus			+																							DYOPMONA
Ebalia cranchii																										EBALCRAN
Ebalia spec.juv.																										EBALJUVE
Ebalia tumefacta																										EBALTUME
Echinocardium cordatum			+			+	+	+	+			+	+			+		+	+		+					ECHICORD
Echinocyamus pusillus			+				+																			ECHIPUSI
Edwardsia claparedii																										EDWACLAP
Ensis directus	+		+									+	+	+	+			+	+	+	+	+		+	+	ENSIDIRE
Ensis arcuatus																										ENSIARCU
Ensis ensis																										ENSIENSI
Eteone barbata																										ETEOBARB
Eteone longa				+			+				+				+				+			+				ETEOLONG
Eudorella truncatula																										EUDOTRUN
Eudorellopsis deformis																										EUDODEFO
Eumida sanguinea			+												+											EUMISANG
Eurydice spinigera																										EURYSPIN
Euspira nitida			+		+		+			+			+						+						+	EUSPNITI
Euzonus flabelligerus										+																EUZOFLAB
Exogone hebes							+																			EXOGHEBE
Gari costulata																										GARICOST
Gari fervensis																										GARIFERV
Gattyana cirrosa																										GATTCIRR
Glycera alba																										GLYCALBA
Glycera lapidum		+																								GLYCLAPI
Glycera rouxi																										GLYCROUX
Glycera spec. juv.			+						+	+																GLYCJUVE
Glycinde nordmanni																										GLYCNORD
Golfingia elongata																										GOLFELON
Golfingia procera																										GOLFPROC
Golfingia vulgaris																										GOLFVULG
Golfingia spec. juv.																										GOLFJUVE
Goniada maculata				+																						GONIMACU
Goodallia triangularis			+							+																GOODTRIAN
Gyptis capensis																										GYPTCAPE
Harmothoe glabra																										HARMGLAB
Harmothoe imbricata																										HARMIMBR
Harmothoe sarsi sarsi																										HARMSARS
Harmothoe spec. juv.																+									+	HARMJUVE
Harpinia antennaria														+												HARPANTE
Heteromastus filiformis							+																			HETEFILI
Hippomedon denticulatus				+			+																			HIPPDENT
Hyala vitrea														+												HYALVITR
Ione thoracica									+																	IONETHOR
Iphinoe trispinosa			+																							IPHITRIS
Labidoplax buski																										LABIBUSK
Lagisca extenuata																										LAGIEXTE
Lanice conchilega		+	+	+			+				+			+	+	+		+			+				+	LANICONC

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area										Coastal area															
	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**
Lepton squamosum																										LEPTSQUA
Leptosynapta inhaerens																										LEPTOINHA
Leucothoe incisa						+	+	+																		LEUCINCI
Liocarcinus spec. juv.																										LIOCSPEC
Lucinoma borealis																										LUCIJUVE
Lumbrineris fragilis																										LUMBFRAG
Lumbrineris latreilli			+																							LUMBLATR
Lutraria lutraria																										LUTRALUT
Lysilla loveni																										LYSILOVE
Macoma balthica											+	+		+		+										MACOBALT
Mactra corallina															+											MACTCORA
Magelona alleni																										MAGEALLE
Magelona johnstoni	+			+	+						+				+	+		+				+			+	MAGEJOHN
Magelona mirabilis				+							+				+	+	+	+	+	+		+			+	MAGEMIRA
Malmgreniella lunulata																										MALMLUNU
Mangelia nebula																										MANGNEBU
Mediomastus fragilis																										MEDIFRAG
Megaluropus agilis		+			+	+		+	+	+																MEGAAGIL
Modiolus spec. juv.																									+	MODIJUVE
Molgula oculata juv.							+			+																MOLGOCUL
Mya truncata																										MYATRUNC
Myriochele oculata																										MYRIOCUL
Mysella bidentata			+			+					+		+	+	+				+	+	+	+		++	+	MYSEBIDE
Mysia undata																										MYSIUNDA
Nebalia bipes																										NEBABIPE
Nematoda			+	+			+																			NEMATODA
Nemertini	+	+	+	+		+	+	+	+	+	+				+										+	NEMERTIN
Nephtys assimilis													+	+				+								NEPHASSI
Nephtys caeca												+	+			+				+					+	NEPHCAEC
Nephtys cirrosa	+	+	+		+	+	+	+	+	+		+	+		+	+	+		+	+	+	+		+		NEPHCIRR
Nephtys hombergii		+		+									+	+	+	+	+			+				+	+	NEPHHOMB
Nephtys incisa																										NEPHINCI
Nephtys longosetosa												+														NEPHLONG
Nephtys spec. juv.				+	+		+	+			+		+	+					+	+		+				NEPHJUVE
Nereis longissima													+		+				+					+		NERELONG
Notomastus latericeus																								+	+	NOTOLATE
Nucula nitidosa																										NUCUNITI
Nucula tenuis														+	+											NUCUTENU
Oligochaeta																								+		OLIGOCHA
Ondina divisa																										ONDIDIVI
Ophelia limacina										+																OPHELIMA
Ophelina acuminata																										OPHEACUM
Ophiodromus flexuosus																										OPHIFLEX
Ophiura albida								+					+											+		OPHIALBI
Ophiura texturata																								+		OPHITEXT
Ophiura spec. juv.		+			+				+									+								OPHIJUVE
Orbinia sertulata																										ORBISERT
Orchomene nana																			+						+	ORCHNANA
Orchomene spec. juv.							+																			ORCHJUVE
Owenia fusiformis													+							+						OWENFUSI
Paraonis fulgens		+			+															+						PARAFULG

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area										Coastal area															
	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	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**
Pectinaria auricoma																										PECTAURI
Pectinaria koreni																										PECTKORE
Perioculodes longimanus						+	+				+		+													PERILONG
Phaxas pellucidus																										PHAXAPEL
Pholoe minuta							+							+										+		PHOLMINU
Phoronida						+	+		+				+													PHORONID
Phyllodoce groenlandica																						+				PHYLGROE
Phyllodoce lineata																									+	PHYLLINE
Phyllodoce rosea																										PHYLROSE
Phyllodocidae spec.																										PHYLSPEC
Podarkeopsis helgolandica																										PODAHELG
Poecilochaetus serpens			+																							POECSERP
Polycirrus medusa																										POLYMEDU
Polydora ciliata																										POLYCILI
Polydora spec.																										POLYSPEC
Polydora spec. juv.																										POLYJUVE
Polynoe kinbergi																										POLYKINB
Polyplacophora							+																			POLYPLAC
Pontocrates altamarinus														+												PONTALTA
Pontophilus trispinosus																										PONTTRIS
Prionospio cirrifera																										PRIOCIRR
Processa nouveli holthuisi																										PROCNOHO
Processa spec.														+												PROCSPEC
Pseudocuma longicornis	+	+	+	+	+	+	+	+	+	+					+	+				+						PSEULONG
Retusa umbilicata																										RETUUMBI
Rhodine loveni																										RHODLOVE
Scalibregma inflatum																										SCALINFL
Scaphander lignarius																										SCAPHLIG
Scolelepis bonnieri		+		+		+	+		+						+						+	+	+			SCOLBONN
Scolelepis foliosa																										SCOLFOLI
Scolelepis squamata																										SCOLSQUA
Scoloplos armiger			+		+	+	+	+			+		+		+					+	+	+		+	+	SCOLARMI
Semierycina nitida																										SEMINITI
Sigalion mathildae															+					+					+	SIGAMATH
Sigalion mathildae juv.																										SIGAMAJU
Siphonoecetus kroyeranus																			+			+				SIPHKROY
Sipunculidae spec.																										SIPUSPEC
Sphenia binghami													+													SPHEBING
Spio filicornis			+		+	+	+				+	+		+		+			+	+					+	SPIOFILI
Spiophanes bombyx			+		+		+	+	+		+	+	+		+	+		+	+	+		+		+	+	SPIOBOMB
Spiophanes kroeyeri																				+						SPIOKROE
Spisula elliptica																										SPISELLI
Spisula solida		+																								SPISSOLI
Spisula subtruncata													+		+	+		+	++							SPISSUBT
Spisula spec. juv.																										SPISJUVE
Sthenelais boa																										STHENBOA
Sthenelais limicola																			+							STHELIMI
Syllidae spec.			+																							SYLLIDAE
Syllis gracilis							+																			SYLLGRAC
Synchelidium maculatum															+	+	+	+					+			SYNCMACU
Synelmis klatti																										SYNEKLAT

Appendix-1 Biomonitoring 2002 (+ = presence)

	Offshore area										Coastal area															
	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	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**
Tellimya ferruginosa								+			+	+	+			+		+	+		+	+				TELLFERR
Tellimya tenella																										TELLTENE
Tellina fabula				+		+					+	+	+	+	+	+		+	+	+	+			+	+	TELLFABU
Tellina pygmea										+																TELLPYGM
Tellina tenuis																										TELLTENU
Terebellidae spec. juv.																										TEREJUVE
Terebellides stroemi																										TERESTRO
Tharyx killariensis																										THARKILL
Thia scutellata							+																			THIASCUT
Thracia convexa																										THRACONV
Thracia phaseolina			+																							THRAPHAS
Thyasira flexuosa														+												THYAFLEX
Tornus subcarinatus							+																			TORNSUBC
Travisia forbesii			+																							TRAVFORB
Turbellaria spec.																										TURBELLA
Turbonilla pusilla																										TURBPUSI
Turritella communis																										TURRCOMM
Upogebia deltaura																										UPOGDELT
Upogebia deltaura juv.																										UPOGJUVE
Upogebia stellata																										UPOGSTEL
Urothoe brevicornis				+	+		+	+			+	+	+	+	+	+		+	+	+	+			+	+	UROTBREV
Urothoe poseidonis	+			+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+		+	+	UROTPOSE
Vitreolina antiflexa																										VITRANTI

station	DOG 1		DOG 2		DOG 3		DOG 4		DOG 5	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev			12.8	0.004						
atylfalc	51.3	0.015								
atylswam			12.8	0.004	25.7	0.008			64.2	0.019
batheleg	680.0	0.204	141.1	0.042	487.5	0.146	615.8	0.185	51.3	0.015
bathguil	166.8	0.050	51.3	0.015	192.5	0.058	269.4	0.081	25.7	0.008
diasbrad	12.8	0.004					25.7	0.008		
hippdent							12.8	0.004		
leucinci			12.8	0.004					25.7	0.008
megaagil	12.8	0.004			12.8	0.004	51.3	0.015		
orchnana							12.8	0.004		
perilong	25.7	0.008	38.5	0.012			12.8	0.004		
pontalta	12.8	0.004					77.0	0.023		
pseulong	38.5	0.012	38.5	0.012	25.7	0.008	12.8	0.004	25.7	0.008
siphkroy	25.7	0.008			25.7	0.008	12.8	0.004	12.8	0.004
syncmacu									12.8	0.004
urotpose	102.6	0.031	51.3	0.015	64.2	0.019			12.8	0.004
Echinodermata										
acrobrac			64.2	6.132	12.8	0.329			89.8	3.449
amphchia	38.5	0.003			64.2	0.218	38.5	0.006	89.8	0.025
amphjuve			25.7	0.001	128.3	0.007				
echicord					12.8	0.138				
Mollusca										
chamstri					25.7	2.492	25.7	0.050		
cylicyli									12.8	0.002
dosilupi	38.5	3.018	12.8	0.047	38.5	0.035			12.8	0.000
euspniti	25.7	0.048	25.7	0.031			12.8	0.064	38.5	0.116
garicost					25.7	0.008				
gariferv					12.8	1.225				
mysebide	12.8	0.001	51.3	0.013	64.2	0.004			64.2	0.007
scaphlig					12.8	0.013				
spissubt			12.8	0.003						
tellfabu	51.3	0.004	128.3	0.014	25.7	0.000	230.9	0.129	615.8	0.189
thraphas	12.8	0.019	12.8	0.006					64.2	0.032
thyaflex									12.8	0.037
vitranti					12.8	0.011				
Polychaeta										
chaeseto	25.7	0.001	141.1	0.008	38.5	0.003			12.8	0.002
eteobarb							12.8	0.001		
eteolong			12.8	0.001	12.8	0.001	12.8	0.001		
gonimacu	77.0	0.020	64.2	0.005	89.8	0.015	38.5	0.015	89.8	0.012
gyptcape	12.8	0.000							12.8	0.002
harmjuve	12.8	0.000	12.8	0.001	12.8	0.001	25.7	0.001		
laniconc			12.8	0.065						
magejohn	192.5	0.005	282.3	0.007	25.7	0.002	38.5	0.002	603.0	0.039
magemira			115.5	0.014	12.8	0.001	25.7	0.001	12.8	0.001
nephcaec									12.8	0.062
nephcirr	38.5	0.014	12.8	0.002						
nephhomb			38.5	0.014			12.8	0.029	25.7	0.054
nephjuve			12.8	0.001	12.8	0.001	12.8	0.001	25.7	0.003
nephlong									12.8	0.038
notolate			12.8	0.114	12.8	0.088	12.8	0.063	25.7	0.053
ophelima					12.8	0.001				
owenfusi			12.8	0.001						
pholminu			12.8	0.001						
phylspec			12.8	0.001					12.8	0.002
podahelg			12.8	0.001						
poecserp			12.8	0.001						

scolarmi	12.8	0.000							12.8	0.002
sigamath			25.7	0.091					51.3	0.007
spiobomb	89.8	0.002	3066.4	0.160	410.6	0.027	551.7	0.025	1193.2	0.031
spiofili			115.5	0.006	12.8	0.001	25.7	0.001	25.7	0.003
sthelimi			12.8	0.009			38.5	0.022		
sthenboa					38.5	0.021				
Miscellaneous taxa										
sipuspec							12.8	0.005		
nemertin	25.7	0.062	38.5	0.002						
phoronid			12.8	0.001	77.0	0.003	38.5	0.002	25.7	0.002
sum	1796.2	3.5	4747.1	6.9	2040.0	5.1	2270.9	0.8	3387.1	4.3
diversity										
nspc	25		38		32		28		33	
SH-W	2.39		1.75		2.67		2.33		2.25	
Simp	0.17		0.42		0.11		0.16		0.19	

station	**DOG 6**		**DOG 7**		**OYS 1**		**OYS 2**		**OYS 3**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu					12.8	0.004			12.8	0.004
atylfalc	12.8	0.004	12.8	0.004						
batheleg	205.3	0.062	282.3	0.085					12.8	0.004
bathguil	205.3	0.062	179.6	0.054					25.7	0.008
calljuve					12.8	0.010	128.3	0.250	12.8	0.008
callsubt					64.2	6.620	89.8	1.220		
diasbrad					12.8	0.004				
eudodefo									12.8	0.004
eudotrun									12.8	0.004
harpante	12.8	0.004			38.5	0.012	25.7	0.008	51.3	0.015
ionethor					77.0	0.077	12.8	0.025		
leucinci	12.8	0.004								
megaagil			12.8	0.004						
perilong	51.3	0.015	38.5	0.012						
pseulong					51.3	0.015			25.7	0.008
siphkroy	12.8	0.004								
syncmacu	12.8	0.004	12.8	0.004						
urotbrev	12.8	0.004	12.8	0.004						
urotpose	77.0	0.023	64.2	0.019						
Echinodermata										
amphchia	166.8	0.447	154.0	0.246						
amphfili					2373.6	5.195	410.6	1.834	1757.7	7.458
brislyri									12.8	9.057
echicord					38.5	18.749			12.8	3.415
ophialbi							38.5	0.002		
Mollusca										
abraalba					12.8	0.288				
chamstri	12.8	0.023			12.8	1.332				
corbgibb							975.1	0.216		
cylicyli					64.2	0.027			77.0	0.055
donavitt	12.8	0.006								
dosilupi	64.2	1.852	12.8	0.007						
ensiensi	12.8	7.086								
euspniti	12.8	0.009	12.8	0.002			12.8	0.009		
garicost	12.8	0.002	12.8	0.003						
gariferv	12.8	0.159								
hyalvitr							51.3	0.051		
mactcora	12.8	0.003								
myatrunc									12.8	0.001
mysebide	64.2	0.006	38.5	0.004	910.9	0.052	128.3	0.008	705.7	0.141

mysiunda					12.8	0.012				
nucuniti					89.8	0.062				
nucutenu									51.3	0.032
scaplign									12.8	0.013
tellfabu	154.0	0.030	269.4	0.070					12.8	0.008
tellferr			12.8	0.006	38.5	0.021				
telltene									77.0	0.037
thraphas			12.8	0.064						
thyaflex					25.7	0.020			25.7	0.023
Polychaeta										
amphspec							12.8	0.017		
chaeseto			12.8	0.001	38.5	0.036			25.7	0.014
chaevari							12.8	7.194		
diplglau					51.3	0.142			12.8	0.007
glycnord							12.8	0.008		
gonimacu	38.5	0.010	25.7	0.004	25.7	0.024			12.8	0.014
harmjuve	25.7	0.001	12.8	0.000	12.8	0.012				
harmsars					12.8	0.012				
lysilove									25.7	0.899
magealle			12.8	0.013						
magejohn	51.3	0.002	230.9	0.007			12.8	0.019		
magemira	25.7	0.001			12.8	0.012	89.8	0.059		
medifrag			12.8	0.001			12.8	0.025		
nephcaec	12.8	0.060								
nephcirr	77.0	0.027	25.7	0.004					12.8	0.044
nephhomb	12.8	0.012			12.8	0.344	12.8	0.559	38.5	0.291
nephjuve			12.8	0.001	25.7	0.024				
notolate									12.8	2.229
ophelima	12.8	0.002								
ophiflex					25.7	0.141	12.8	0.008	25.7	0.073
owenfusi	51.3	0.009	25.7	0.001			77.0	0.051	12.8	0.008
pectauri									12.8	0.240
pectkore					12.8	0.003				
pholminu			25.7	0.001	38.5	0.036			154.0	0.081
phylrose			12.8	0.001						
phylspec							12.8	0.008		
polykinb									25.7	0.174
scolarmi					25.7	0.024				
sigamath			12.8	0.001						
spiobomb	256.6	0.010	1013.6	0.054	25.7	0.024	64.2	0.042	12.8	0.008
spiofili	12.8	0.001	12.8	0.001	64.2	0.059				
sthelimi					64.2	0.190			38.5	0.051
syneklat					25.7	0.024			25.7	0.017
Miscellaneous taxa										
anthozoa							12.8	8.679		
edwaclap			12.8	0.025			25.7	0.051	12.8	0.011
nemertin	12.8	0.327	51.3	0.113	51.3	2.060	12.8	0.169	12.8	2.015
oligocha							38.5	0.025		
turbella					25.7	0.003			25.7	0.034
golfvulg					12.8	0.005	38.5	0.020		
phoronid	64.2	0.022	12.8	0.001	128.3	0.107	230.9	0.105	230.9	0.091
sum	1809.0	10.3	2668.6	0.84	4541.8	36.12	2566.0	20.8	3656.6	26.7
diversity										
nspc	34		33		37		27		38	
SH-W	2.96		2.35		1.94		2.29		2.05	
Simp	0.07		0.18		0.31		0.18		0.27	

station	**OYS 4**		**OYS 5**		**OYS 6**		**OYS 7**		**OYS 8**	
Crustacea	N	B	N	B	N	B	N	B	N	B

ampebrev							25.7	0.008		
ampetenu			38.5	0.012			51.3	0.015		
batheleg	12.8	0.004	12.8	0.004	12.8	0.004	12.8	0.004		
calljuve			25.7	0.075	12.8	0.025			12.8	0.008
callsubt			25.7	2.103					115.5	9.061
coroaffi							25.7	0.008		
eudotrun			12.8	0.004						
harpante			12.8	0.004	12.8	0.004	64.2	0.019	12.8	0.004
ionethor			12.8	0.064						
iphitris									12.8	0.004
leucinci									38.5	0.012
pontalta					25.7	0.008			12.8	0.004
procnoho									12.8	0.212
pseulong									12.8	0.004
syncmacu	12.8	0.004			12.8	0.004				
syncmacu			12.8	0.004						
upogdelt			12.8	5.038					12.8	8.381
urotpose									12.8	0.004
Echinodermata										
acrobrac	25.7	1.227								
amphfili			1077.7	4.401	615.8	8.765	834.0	5.428	51.3	0.140
amphjuve	307.9	0.167								
asterube							25.7	0.005		
echicord							102.6	0.145		
labibusk			12.8	0.070						
ophialbi									256.6	1.151
ophijuve					12.8	0.000				
Mollusca										
abraalba									25.7	0.087
abrapris					12.8	0.065				
chamstri	38.5	0.051								
corbgibb			102.6	0.418			12.8	0.002	115.5	0.185
cylicyli			38.5	0.076	38.5	0.089	77.0	0.020		
dosilupi					12.8	2.412				
euspniti	38.5	0.144	25.7	0.280					64.2	0.097
goodtrian	12.8	0.003								
hyalvitr			25.7	0.026			12.8	0.013		
lucibore					25.7	0.805				
mangnebu	25.7	0.026								
myatrunc							38.5	0.002		
mysebide	89.8	0.010	77.0	0.012	705.7	0.080	513.2	0.031	12.8	0.001
mysiunda							25.7	0.006		
nucuniti	38.5	0.191	38.5	0.024	12.8	0.002	12.8	0.002	38.5	0.145
phaxapel					12.8	0.001	12.8	0.001		
seminiti									12.8	0.001
tellfabu	449.1	0.142			38.5	0.011				
tellferr	38.5	0.015								
thraphas	64.2	0.009							38.5	0.001
thyaflex	154.0	0.561								
Polychaeta										
aphemari							12.8	0.003		
aphracul									12.8	7.365
chaeseto	38.5	0.025			25.7	0.007				
chaevari					12.8	8.417				
diplglau	25.7	0.017	12.8	0.005					38.5	0.020
eteolong	12.8	0.008								
glycjuve			12.8	0.008						
gonimacu	38.5	0.041			25.7	0.007	12.8	0.003		
gyptcape	12.8	0.008	25.7	0.010	12.8	0.003			25.7	0.014

harmimbr			12.8	0.152						
harmjuve	12.8	0.008								
laniconc					12.8	1.423				
magealle	12.8	0.053								
magejohn	333.6	0.220			64.2	0.017				
magemira	526.0	0.347	12.8	0.005	25.7	0.007			12.8	0.007
medifrag							12.8	0.003	192.5	0.102
myriocul			12.8	0.005			12.8	0.015	38.5	0.020
nephcaec	12.8	0.913								
nephcirr									12.8	0.030
nephhomb			12.8	0.279	25.7	0.351	102.6	0.278		
nephinci			64.2	1.313						
nephjuve	77.0	0.051			12.8	0.003				
nephlong									12.8	1.209
nerelong			12.8	0.354	12.8	0.102			38.5	0.437
notolate	64.2	4.195					12.8	0.142	25.7	0.081
ophiflex							12.8	0.003		
orbisert			12.8	0.315						
owenfusi	12.8	0.008					12.8	0.003		
parafulg							12.8	0.003		
pectauri	25.7	0.000					25.7	0.007		
pholminu			12.8	0.005	154.0	0.041	12.8	0.003	25.7	0.014
phylrose			12.8	0.005						
phylspec					51.3	0.014				
polyjuve									25.7	0.014
rhodlove							12.8	0.137		
scolarmi	77.0	0.147			38.5	0.010				
sigamath	64.2	0.549								
spiobomb	128.3	0.085			333.6	0.088	38.5	0.010	12.8	0.007
spiofili			51.3	0.020	51.3	0.014	25.7	0.007		
sthelimi							64.2	0.132		
syneklat					25.7	0.007	12.8	0.003		
terestro							12.8	0.003		
Miscellaneous taxa										
anthozoa							25.7	0.014		
edwaclap	25.7	0.028								
nemertin	128.3	0.319	12.8	0.138	12.8	0.031			25.7	0.104
turbella	12.8	0.010					12.8	0.008	12.8	0.003
phoronid	64.2	0.034	115.5	0.076	89.8	0.036	115.5	0.061	1898.8	1.003
sum	3015.1	9.9	1963.0	15.3	2553.2	22.9	2412.0	6.6	3284.5	30.0
diversity										
nspc	35		32		33		36		35	
SH-W	2.87		2.09		2.41		2.47		1.95	
Simp	0.08		0.31		0.16		0.17		0.35	

station	**OYS 9**		**OYS 10**		**OYS 11**		**OYS 12**		**OYS 13**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu							12.8	0.004		
batheleg	128.3	0.038								
bathguil	51.3	0.015	12.8	0.004						
calljuve	77.0	0.075			38.5	0.246	25.7	0.121	12.8	0.038
callsubt	102.6	6.922	38.5	1.588	115.5	6.655	51.3	2.342	38.5	3.581
coryjuve									12.8	0.291
diasbrad	12.8	0.004	12.8	0.004	12.8	0.004				
dyopmona							12.8	0.004		
eudodefo	12.8	0.004					12.8	0.004		
harpante	102.6	0.031	38.5	0.012	12.8	0.004	51.3	0.015		
hippdent									25.7	0.008

ionethor	38.5	0.038	25.7	0.048	25.7	0.026	12.8	0.013		
leucinci	25.7	0.008			25.7	0.008				
orchjuve	12.8	0.004								
pontalta	12.8	0.004					12.8	0.004		
pseulong	12.8	0.004	12.8	0.004			12.8	0.004		
upogdelt					12.8	1.840				
upogjuve					38.5	0.102				
urotpose	64.2	0.019								
Echinodermata										
amphfili	141.1	0.445	2617.3	13.256	115.5	0.419	77.0	0.121	1565.3	7.607
echicord			12.8	3.587			12.8	2.114	38.5	11.945
ophialbi					115.5	0.608				
Mollusca										
abraalba					38.5	0.003			12.8	0.218
acanechi			12.8	11.417						
aplacoph			12.8	0.086						
chamstri									25.7	0.047
corbgibb	141.1	0.030			128.3	0.049	89.8	0.084		
cylicyli			77.0	0.030			12.8	0.002	38.5	0.014
dosilupi			12.8	0.019						
euspniti	25.7	0.013			12.8	0.004				
hyalvitr	12.8	0.013			25.7	0.026	12.8	0.013		
leptsqua					12.8	0.113				
myatrunc							12.8	0.001		
mysebide	38.5	0.004	1744.9	0.194	25.7	0.004	718.5	0.144	1206.0	0.127
mysiunda							12.8	0.001		
nucuniti	77.0	0.169	64.2	0.074	51.3	0.082	12.8	0.002	115.5	0.125
nucutenu			77.0	0.027						
phaxapel			25.7	0.700						
seminiti			38.5	0.004	12.8	0.001				
tellferr									38.5	0.050
thraconv			12.8	0.003						
thraphas	25.7	0.001								
thyaflex									51.3	0.039
vitranti			12.8	0.011						
Polychaeta										
chaeseto	25.7	0.030	51.3	0.020					51.3	0.020
diplglau	51.3	0.061	12.8	0.005	12.8	0.025			51.3	0.141
exoghebe	12.8	0.015								
gattcirr							25.7	0.014		
glycjuve					12.8	0.025				
glycroux							12.8	0.501		
gonimacu					12.8	0.078	12.8	0.007	12.8	0.005
gyptcape			12.8	0.005						
gyptcape					38.5	0.034				
lysilove					12.8	0.117				
magealle	12.8	0.176	12.8	0.005						
magejohn	500.4	0.462	25.7	0.010					12.8	0.005
magemira	38.5	0.036								
medifrag					64.2	0.127	89.8	0.047		
myriocul	12.8	0.015			77.0	0.152	12.8	0.007		
nephassi									25.7	0.572
nephhomb			38.5	0.120			12.8	0.403		
nephinci							12.8	0.293		
nephjuve	12.8	0.015								
nerelong					25.7	0.354				
notolate					38.5	0.940				
opheacum					12.8	0.019				
ophiflex	12.8	0.015	25.7	0.034	38.5	0.120	25.7	0.091		

parafulg							25.7	0.014		
pectauri							12.8	0.007		
pholminu			154.0	0.061					102.6	0.041
polycili					89.8	0.066				
polykinb					12.8	0.017				
scalinfl	51.3	0.061								
scolarmi			12.8	0.005						
sigamath	12.8	0.073								
spiobomb	38.5	0.046	25.7	0.010	25.7	0.051			38.5	0.015
spiofili			12.8	0.005			51.3	0.027		
sthelimi			25.7	0.075					25.7	0.051
syneklat	12.8	0.015	25.7	0.010			12.8	0.007		
Miscellaneous taxa										
nemertin	51.3	0.107			12.8	0.025	25.7	0.796	38.5	0.008
turbella			12.8	0.005						
golfelon					25.7	0.300	25.7	0.007		
golfvulg							12.8	0.156		
phoronid	154.0	0.081	64.2	0.034	808.3	0.320	192.5	0.076	38.5	0.020
sum	2117.0	9.2	5375.8	31.5	2142.6	13.0	1732.1	7.51	3579.6	25.0
diversity										
nspc	35		34		35		34		23	
SH-W	2.97		1.63		2.66		2.47		1.71	
Simp	0.08		0.34		0.16		0.19		0.31	

station	**OYS 14**		**OYS 15**		**OYS 16**		**OYS 17**		**OYS 18**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev	12.8	0.004								
ampetenu			12.8	0.004	12.8	0.004				
batheleg					12.8	0.004	12.8	0.004	12.8	0.004
bathguil									64.2	0.019
calljuve	38.5	0.090	25.7	0.204					102.6	0.296
callsubt	64.2	7.862	38.5	3.797	12.8	0.462	38.5	2.494	51.3	2.550
cirobore					12.8	0.235				
corycass			12.8	7.375	12.8	2.194	12.8	4.702		
ebaljuve			12.8	0.004						
ebaltume							12.8	0.008		
eudotrun					12.8	0.004	89.8	0.027		
harpante	89.8	0.027	115.5	0.035	64.2	0.019	12.8	0.004		
ionethor			25.7	0.026						
upogstel			12.8	0.370						
urotpose							102.6	0.031		
Echinodermata										
amphfili	474.7	3.066	295.1	1.606	1154.7	2.773	179.6	0.408	320.8	2.366
echicord	38.5	3.647			25.7	11.962	12.8	6.399	12.8	0.138
Mollusca										
abraalba							12.8	0.039		
abraniti			12.8	0.030						
bivainde	12.8	0.001								
corbgibb	1154.7	1.238	141.1	0.033	256.6	0.288	64.2	0.029	680.0	0.157
cylicyli							12.8	0.001	25.7	0.162
dosilupi	12.8	0.003								
euspniti									51.3	0.084
hyalvitr	12.8	0.013								
mysebide	25.7	0.001	25.7	0.002	51.3	0.005	38.5	0.002	269.4	0.024
nucuniti	77.0	0.044			64.2	0.019	64.2	0.304		
retuumbi			12.8	0.006						
seminiti			12.8	0.001						
spiselli									25.7	0.009

tellfabu							12.8	0.000		
tellferr	12.8	0.028			64.2	0.079				
thraphas							64.2	0.002	25.7	0.001
Polychaeta										
aphemari	64.2	0.025								
chaeseto	25.7	0.010	51.3	0.034			25.7	0.014	38.5	0.066
chaevari	12.8	6.430	12.8	3.833						
chondune									25.7	0.044
diplglau			12.8	0.008			12.8	0.007		
gattcirr			12.8	0.527						
glycjuve			12.8	0.008						
glyclapi			25.7	0.135						
glycnord	12.8	0.005								
gonimacu	12.8	0.005					64.2	0.151	25.7	0.115
gyptcape	12.8	0.005			12.8	0.007			12.8	0.022
harmjuve							12.8	0.007		
laniconc	12.8	0.188								
magealle	12.8	0.005							25.7	0.093
magejohn							141.1	0.391	192.5	0.279
magemira					12.8	0.007	128.3	0.356	89.8	0.130
nephcirr							25.7	0.014	25.7	0.173
nephhomb	25.7	0.073	12.8	0.207	25.7	0.239				
notolate	25.7	0.307	25.7	1.348					12.8	0.020
ophiflex	25.7	0.071							12.8	0.036
orbisert	12.8	1.531								
parafulg	38.5	0.015								
pectauri	89.8	0.340	12.8	0.008						
pectkore	12.8	1.998								
pholminu					12.8	1.694				
phylrose	12.8	0.005								
poecserp					12.8	0.007			12.8	0.059
scolarmi							12.8	0.007		
sigamath							12.8	0.051		
spiobomb									154.0	0.264
spiofili	128.3	0.051	77.0	0.051	51.3	0.027				
spiokroe							12.8	0.007		
sthelimi	12.8	0.056	12.8	0.037			12.8	0.059		
syneklat	12.8	0.005	25.7	0.017	38.5	0.020	25.7	0.014	25.7	0.044
terestro	12.8	1.263	12.8	0.046						
tharkill	12.8	0.005								
Miscellaneous taxa										
anthozoa	12.8	0.025								
nemertin	12.8	0.056			25.7	2.190	12.8	0.023	38.5	0.308
turbella			12.8	0.003			12.8	0.003		
golfvulg	12.8	0.022	12.8	0.020						
phoronid	89.8	0.047	64.2	0.044	38.5	0.020	77.0	0.041	564.5	0.298
sum	2745.6	28.9	1154.7	19.8	1988.7	22.3	1334.3	15.9	2899.6	7.9
diversity										
nspc	38		30		22		31		27	
SH-W	2.35		2.79		1.75		3.01		2.51	
Simp	0.21		0.10		0.36		0.06		0.12	

station	**OYS 19**		**OYS 20**		**OYS 21**		**OYS 22**		**OYS 23**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu			12.8	0.004						
argishama							12.8	0.004		
batheleg									12.8	0.004
bathguil							25.7	0.008	12.8	0.004
bopysquil					25.7	0.156				

calljuve	12.8	0.015	12.8	0.037	64.2	0.087				
callsubt	38.5	0.987	89.8	6.584	102.6	5.364	38.5	2.721	25.7	3.576
cirobore	12.8	2.192								
corycass					12.8	0.398			12.8	0.140
ebaltume			25.7	0.027					12.8	0.004
eudotrun	12.8	0.004	12.8	0.004						
harpante	12.8	0.004	38.5	0.012	25.7	0.008			12.8	0.004
ionethor	25.7	0.050					12.8	0.025		
leucinci					12.8	0.004				
orchnana			12.8	0.004						
perilong					12.8	0.004			12.8	0.004
pseulong							25.7	0.008		
upogdelt					64.2	31.042				
upogjuve					12.8	0.013				
urotpose			12.8	0.004					12.8	0.004
Echinodermata										
amphfili	1052.1	3.389	230.9	1.342	115.5	0.695	641.5	1.035	1770.5	7.887
brislyri			25.7	17.771						
echicord	12.8	5.649	12.8	5.892						
ophialbi					25.7	0.437				
Mollusca										
abraalba			25.7	0.026						
abraniti	12.8	0.017								
acanjuve									12.8	0.001
chamstri			12.8	0.576						
corbgibb	12.8	0.028			51.3	0.086	12.8	0.014		
cylicyli	38.5	0.013			25.7	0.122			12.8	0.004
dosilupi			25.7	2.415						
euspniti			25.7	0.003	25.7	0.042				
hyalvitr	12.8	0.013	12.8	0.013						
leptsqua					12.8	0.113				
lucibore									12.8	0.402
mactcora					25.7	0.028				
mysebide	230.9	0.018	77.0	0.007	38.5	0.006	205.3	0.014	1590.9	0.156
mysiunda									12.8	0.143
nucuniti	12.8	0.019	12.8	0.001	38.5	0.205	12.8	0.002	243.8	0.535
ondidivi					12.8	0.013				
phaxapel	12.8	0.001					12.8	0.180	51.3	0.616
tellfabu									38.5	0.373
tellferr			25.7	0.032						
telltene			38.5	0.024						
telltenu									77.0	0.027
thraphas									25.7	0.003
thyaflex	12.8	0.004					51.3	0.028	77.0	0.089
Polychaeta										
aonipauc					12.8	0.007				
chaeseto	25.7	0.010	25.7	0.010			38.5	0.025	25.7	0.010
diplglau	51.3	0.020			25.7	0.014	12.8	0.008	38.5	0.063
glycjuve	12.8	0.005								
glycroux			12.8	0.379						
gonimacu					12.8	0.007			12.8	0.005
gyptcape							25.7	0.017		
harmjuve			12.8	0.005						
laniconc							12.8	1.409		
lumblatr			12.8	0.046	25.7	0.014				
magealle			12.8	0.005			12.8	0.014		
magejohn					12.8	0.007	12.8	0.008		
magemira			64.2	0.025			77.0	0.051	128.3	0.051
malmlunu									12.8	0.005

medifrag					89.8	0.047				
myriocul					25.7	0.014				
nephcaec							12.8	0.901	12.8	0.742
nephhomb	12.8	0.398	25.7	0.205	12.8	0.142			25.7	0.610
nephinci					12.8	0.860				
nephjuve			12.8	0.005					12.8	0.005
nerelong			12.8	0.269	12.8	0.007	12.8	0.008		
notolate			25.7	1.646	51.3	0.950				
ophiflex			25.7	0.080	12.8	0.053	25.7	0.200	25.7	0.142
pectauri			12.8	0.027						
pectkore							12.8	0.008		
pholminu	77.0	0.030	12.8	0.005			12.8	0.008	128.3	0.051
phylgroe					12.8	0.124				
poecserp			12.8	0.005						
polycili			25.7	0.010	89.8	0.047				
scolarmi	12.8	0.005					12.8	0.008	154.0	0.086
sigamath							25.7	1.175		
spiobomb							102.6	0.068	256.6	0.102
spiofili	25.7	0.010	25.7	0.010					38.5	0.015
sthelimi							38.5	0.110		
syneklat	12.8	0.005	64.2	0.025			25.7	0.017		
Miscellaneous taxa										
nemertin	12.8	2.052	12.8	0.034			12.8	0.121	51.3	0.048
turbella	25.7	0.008	38.5	0.005						
golfelon					25.7	0.345				
phoronid	38.5	0.020	89.8	0.047	1372.8	0.544	64.2	0.034	128.3	0.085
sum	1834.7	15.0	1283.0	37.7	2514.7	42.0	1603.8	8.2	5093.5	16.0
diversity										
nspc	27		40		35		30		35	
SH-W	1.85		3.28		2.16		2.44		2.10	
Simp	0.35		0.05		0.30		0.18		0.23	

station	**OYS 24**		**OYS 25**		**OYS 26**		**OYS 27**		**OYS 28**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev							12.8	0.004		
ampetenu			12.8	0.004	89.8	0.027				
argishama									12.8	0.004
atylswam	12.8	0.004								
batheleg	12.8	0.004							89.8	0.027
bathguil							25.7	0.008	102.6	0.031
calljuve	38.5	0.348			12.8	0.025			77.0	0.040
callsubt	102.6	4.678			102.6	5.941			51.3	3.855
diasbrad							12.8	0.004	12.8	0.004
diogpugi	12.8	0.056								
eudodefo									12.8	0.004
eudotrun			12.8	0.004	12.8	0.004				
harpante	12.8	0.004			12.8	0.004	51.3	0.015	38.5	0.012
ionethor	25.7	0.026			51.3	0.051				
leucinci									25.7	0.008
liocspec	12.8	0.146								
orchnana									12.8	0.004
perilong									12.8	0.004
pseulong									12.8	0.004
upogdelt	12.8	0.035								
urotpose							25.7	0.008	12.8	0.004
Echinodermata										
amphfili			282.3	1.081	1193.2	5.459	115.5	0.654	25.7	0.014
echicord	154.0	29.989	12.8	0.903			12.8	8.100	25.7	18.450

ophialbi	64.2	0.001			64.2	0.354				
ophijuve							12.8	0.000	25.7	0.000
Mollusca										
abraalba	51.3	0.245	12.8	0.002						
corbgibb			12.8	0.004	487.5	0.725	397.7	1.115		
cylicyli			12.8	0.004					12.8	0.012
dosilupi									12.8	0.001
euspniti	38.5	0.885					12.8	0.002		
hyalvitr			25.7	0.026	38.5	0.038	12.8	0.013		
lutralut	12.8	339.5								
mysebide	333.6	0.032	64.2	0.003	89.8	0.008	12.8	0.001		
mysiunda					12.8	0.009				
nucuniti	102.6	0.306	12.8	0.002			51.3	0.110	51.3	0.261
spiselli									12.8	0.001
tellfabu	12.8	0.001							38.5	0.001
tellferr	51.3	0.042	25.7	0.011			25.7	0.029	77.0	0.046
thraphas									12.8	0.000
Polychaeta										
amphfinm					12.8	0.014				
aphracul	12.8	26.931								
chaeseto			12.8	0.007			12.8	0.000	38.5	0.025
chaevari							12.8	4.232		
diplglau	25.7	0.027			51.3	0.020			12.8	0.008
eteolong									12.8	0.008
eumisang									25.7	0.017
exoghebe							25.7	0.010		
gattcirr							12.8	0.498		
glycalba					12.8	0.005				
gonimacu	51.3	0.137							12.8	0.008
gyptcape	12.8	0.014	12.8	0.007	51.3	0.020				
harmglab	12.8	0.014								
lumbfrag					12.8	0.005				
lumblatr	89.8	0.274			64.2	0.129				
lysilove	38.5	1.282								
magealle									12.8	0.171
magejohn							192.5	0.229	1552.4	1.434
magemira							77.0	0.091	25.7	0.024
medifrag	51.3	0.054								
myriocul					38.5	0.015				
nephcaec	12.8	1.372								
nephhomb			12.8	0.694						
nephinci					51.3	1.666				
nephjuve	77.0	0.081	12.8	0.007						
nerelong							12.8	0.403		
notolate	25.7	0.027			12.8	0.457				
ophiflex					12.8	0.069			12.8	0.041
owenfusi	12.8	0.014								
pectkore							12.8	0.005		
pholminu					51.3	0.020				
phylgroe					12.8	0.095				
phylrose					12.8	0.005				
poecserp							25.7	0.010	25.7	0.017
polykinb	12.8	0.058								
scalinfl	179.6	0.222							12.8	0.008
scolarmi									12.8	0.008
sigamath	12.8	0.412							38.5	0.596
spiobomb	230.9	0.244			115.5	0.046			38.5	0.025
spiofili			12.8	0.007	64.2	0.025				
spiokroe			12.8	0.058						

sthelimi	12.8	0.014	12.8	0.007			51.3	0.205	25.7	0.064
syneklat					12.8	0.005			12.8	0.008
terestro					12.8	0.049				
Miscellaneous taxa										
edwaclap							12.8	0.025		
nemertin	38.5	0.310	12.8	0.059			12.8	0.071	25.7	0.206
turbella					12.8	0.002	51.3	0.007		
golfelon					12.8	0.083				
golfvulg							12.8	0.014		
phoronid	179.6	0.071			205.3	0.108	12.8	0.007	64.2	0.034
sum	2155.4	407.9	590.2	3.3	3002.2	15.5	1321.5	15.9	2732.8	25.6
diversity										
nspc	37		19		32		29		41	
SH-W	3.07		2.12		2.35		2.63		2.17	
Simp	0.06		0.23		0.19		0.12		0.33	

station	**OYS 29**		**OYS 30**		**OYS 31**		**OYS 32**		**OYS 33**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu	12.8	0.004			25.7	0.008			12.8	0.004
argishama					12.8	0.004				
batheleg	12.8	0.004								
bathguil	25.7	0.008			12.8	0.004				
calljuve			51.3	0.235	102.6	0.289	51.3	0.062		
callsubt			230.9	13.787	115.5	6.031	64.2	1.603	38.5	1.994
cirobore					12.8	0.366				
diasbrad			64.2	0.019	12.8	0.004	12.8	0.004	25.7	0.008
eudotrun			25.7	0.008	38.5	0.012				
harpante			25.7	0.008	218.1	0.065	51.3	0.015	64.2	0.019
ionethor							25.7	0.026	12.8	0.013
megaagil	12.8	0.004								
nebabipe							12.8	0.004		
perilong					12.8	0.004				
procnoho			12.8	0.277						
siphkroy							38.5	0.012		
upogdelt					25.7	0.065				
urotpose					38.5	0.012				
Echinodermata										
amphfili	449.1	0.496	64.2	0.241	769.8	3.177	654.3	2.852	1244.5	4.099
brislyri									12.8	3.949
echicord	12.8	10.451	141.1	12.950						
leptoinha					12.8	1.834				
ophialbi			25.7	0.006						
ophijuve							25.7	0.001		
Mollusca										
abraalba	64.2	0.080	64.2	0.183	12.8	0.003				
abrapris	12.8	0.065								
chamstri	12.8	0.006			12.8	0.013				
corbgibb	12.8	0.041			51.3	0.013	2424.9	9.046	12.8	0.002
cylicyli					25.7	0.004	64.2	0.035	25.7	0.021
euspniti			12.8	0.015			25.7	0.052		
hyalvitr									38.5	0.038
mysebide	89.8	0.008	12.8	0.001	102.6	0.010			205.3	0.019
mysiunda	38.5	0.003			12.8	0.001	77.0	0.011		
nucuniti	218.1	0.637	243.8	0.362	89.8	0.049	115.5	0.056		
phaxapel									25.7	0.144
tellfabu	89.8	0.024	12.8	0.000						
tellferr	64.2	0.068	25.7	0.014						
telltene									25.7	0.010
thraconv			12.8	0.030						

thraphas	38.5	0.029			12.8	0.000				
thyaflex	243.8	0.311								
turrcomm					51.3	2.135	12.8	0.000	12.8	1.463
Polychaeta										
aphemari									12.8	0.005
capicapi							25.7	0.034		
chaeseto									38.5	0.015
chaevari							179.6	54.167	25.7	8.383
diplglau	12.8	0.003			77.0	0.102			12.8	0.005
gattcirr							192.5	3.592	38.5	0.515
glycalba							12.8	0.127		
glycjuve							12.8	0.017		
glyclapi					12.8	0.200				
gonimacu	51.3	0.069	25.7	0.034	25.7	0.027				
gyptcape					102.6	0.041	12.8	0.017		
lumblatr			25.7	0.027			12.8	0.081		
magealle	25.7	0.525								
magejohn	89.8	0.047	25.7	0.027	25.7	0.010				
magemira	179.6	0.095			12.8	0.005				
medifrag			25.7	0.027	12.8	0.005	12.8	0.017		
myriocul			25.7	0.027						
nephcirr									12.8	0.005
nephhomb	25.7	0.169	38.5	1.587	38.5	0.478	25.7	0.259	25.7	0.461
nephjuve			25.7	0.027						
nerelong							12.8	0.017	12.8	0.203
notolate	77.0	6.561					25.7	0.149		
ophiflex	12.8	0.130			51.3	0.115	12.8	0.017	12.8	0.046
pectauri					12.8	0.005	38.5	0.051	25.7	0.183
pectkore									12.8	0.723
pholminu			12.8	0.014	12.8	0.005			51.3	0.020
phylgroe			12.8	0.290	25.7	0.222				
phylrose	12.8	0.003								
phylspec					12.8	0.005				
poecserp	12.8	0.063			25.7	0.010				
polymedu									12.8	0.073
scalinfl			38.5	0.041	38.5	0.051			12.8	0.005
scolarmi	12.8	0.003								
sigamath	25.7	0.686								
spiobomb	179.6	0.047	77.0	0.081	38.5	0.015			12.8	0.005
spiofili					38.5	0.015			89.8	0.036
spiokroe									25.7	0.095
sthelimi	12.8	0.003			12.8	0.005			51.3	0.180
syneklat					25.7	0.010			38.5	0.015
Miscellaneous taxa										
anthozoa	12.8	9.961								
nemertin	38.5	0.088	12.8	0.031	38.5	5.470	12.8	0.517	12.8	0.271
turbella			12.8	0.086	25.7	0.003			25.7	0.068
golfvulg							423.4	1.219	25.7	0.019
phoronid	64.2	0.034	205.3	0.081	38.5	0.020	77.0	0.041	89.8	0.047
branlanc									25.7	0.025
sum	2258.1	30.8	1590.9	30.5	2489.0	20.9	4747.1	74.3	2463.4	23.3
diversity										
nspc	34		30		45		31		38	
SH-W	2.90		2.89		2.98		1.95		2.31	
Simp	0.08		0.07		0.11		0.29		0.27	

station	**OYS 34**		**OYS 35**		**OYS 36**		**OYS 37**		**OYS 38**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev			12.8	0.004	12.8	0.004			12.8	0.004

ampetenu							12.8	0.004		
batheleg			12.8	0.004					25.7	0.008
bathguil			12.8	0.004					12.8	0.004
calljuve			25.7	0.054	115.5	0.089	51.3	0.052	64.2	0.092
callsubt	141.1	9.257	25.7	3.016	102.6	6.056	64.2	2.877	64.2	5.200
diasbrad	12.8	0.004			25.7	0.008				
eudotrun	25.7	0.008	38.5	0.012	25.7	0.008	25.7	0.008	12.8	0.004
harpante	12.8	0.004	128.3	0.038	12.8	0.004				
ionethor	25.7	0.050			25.7	0.026			25.7	0.026
leucinci			12.8	0.004			12.8	0.004		
orchnana			12.8	0.004					12.8	0.004
perilong									12.8	0.004
pseulong			12.8	0.004						
upogdelt					51.3	10.358	12.8	0.416		
upogjuve	12.8	0.025								
Echinodermata										
amphfili	12.8	0.006	397.7	1.062	102.6	1.360	513.2	1.751	25.7	0.110
echicord									25.7	2.754
leptoinha							12.8	1.763		
ophialbi					38.5	0.681				
Mollusca										
abraalba			12.8	0.013					64.2	0.415
abrapris			12.8	0.032						
chamstri									12.8	0.006
corbgibb	64.2	0.328	269.4	0.061	12.8	0.002	179.6	0.372		
cylicyli			51.3	0.028			25.7	0.002		
dosilupi			12.8	0.004						
euspniti	12.8	0.023	12.8	0.004	12.8	0.004			38.5	0.260
hyalvitr					12.8	0.013	12.8	0.013		
mysebide			77.0	0.006			77.0	0.008	333.6	0.074
mysiunda							12.8	0.003		
nucuniti	51.3	0.021	102.6	0.040	12.8	0.087			230.9	0.617
ondidivi					12.8	0.006				
spiselli									12.8	0.004
tellfabu									12.8	0.000
tellferr									25.7	0.013
thraphas			12.8	0.000						
turrcomm					25.7	0.436	12.8	4.313		
Polychaeta										
amphacut	12.8	0.008								
chaevari			12.8	7.086			12.8	3.970		
diplglau					12.8	0.003				
exoghebe			12.8	0.010						
gattcirr			12.8	0.450			12.8	0.325		
glycjuve			12.8	0.010						
glyclapi					12.8	0.041				
gonimacu	38.5	0.025			38.5	0.010	12.8	0.002	25.7	0.024
gyptcape	12.8	0.008			64.2	0.051			12.8	0.008
laniconc									12.8	1.335
lumbfrag					12.8	0.003				
lumblatr	12.8	0.008			38.5	0.146				
magejohn			115.5	0.061					38.5	0.025
magemira			128.3	0.068						
malmlunu							12.8	0.083		
medifrag	166.8	0.110			89.8	0.024			12.8	0.008
myriocul					51.3	0.014	12.8	0.002		
nephcaec							25.7	2.317		
nephcirr			12.8	0.010						
nephhomb	25.7	0.559	38.5	0.242			38.5	0.046	12.8	0.036

nephinci	12.8	0.307			12.8	0.261	12.8	0.025		
nephjuve	25.7	0.017	12.8	0.010					12.8	0.008
nerelong	12.8	0.210			38.5	0.195	25.7	0.041		
notolate	128.3	2.422			38.5	0.354	12.8	0.252		
ophiflex	12.8	0.034	12.8	0.010			25.7	0.051	12.8	0.053
owenfusi			12.8	0.010						
parafulg							25.7	0.003		
pectkore							25.7	0.003		
pholminu			38.5	0.030			12.8	0.002	12.8	0.008
phylgroe					12.8	0.286				
phylrose			12.8	0.010						
poecserp	25.7	0.017	12.8	0.010					25.7	0.017
polycili					25.7	0.007				
priocirr	12.8	0.008								
scalinfl			38.5	0.030					12.8	0.008
scolarmi			12.8	0.010						
spiobomb	12.8	0.008	141.1	0.112	51.3	0.014	12.8	0.002	12.8	0.008
spiofili							12.8	0.002		
spiokroe			12.8	0.010						
sthelimi	12.8	0.054	25.7	0.047						
syneklat			25.7	0.020			25.7	0.003		
Miscellaneous taxa										
anthozoa							12.8	0.000		
nemertin	38.5	0.065	51.3	0.104	38.5	0.099	12.8	0.034		
turbella			25.7	0.005	38.5	0.008				
golfvulg							38.5	0.242		
golfproc					12.8	0.010	12.8	0.078		
phoronid	269.4	0.142	64.2	0.034	757.0	0.400	38.5	0.017	243.8	0.097
branlanc							12.8	0.048		
sum	1206.0	13.8	2104.1	12.8	1950.2	21.1	1475.5	19.2	1475.5	11.4
diversity										
nspc	27		43		34		37		32	
SH-W	2.69		3.09		2.64		2.75		2.72	
Simp	0.09		0.07		0.16		0.14		0.11	

station	**OYS 39**		**OYS 40**		**OYS 41**		**OYS 42**		**OFF 1**	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev	12.8	0.004								
ampetenu					25.7	0.008				
apheoval			12.8	0.004						
batheleg			51.3	0.015	12.8	0.004				
bathguil					12.8	0.004	38.5	0.012	77.0	0.023
callsubt			12.8	1.692					25.7	1.008
caprelli			12.8	0.004						
ebalcran					12.8	0.004				
eudodefo					12.8	0.004			38.5	0.012
harpante	12.8	0.004	12.8	0.004	12.8	0.004				
hippdent					12.8	0.004				
leucinci									115.5	0.035
orchnana							12.8	0.004		
perilong			38.5	0.012						
pseulong			25.7	0.008	38.5	0.012	12.8	0.004		
siphkroy							51.3	0.015	12.8	0.004
syncmacu									12.8	0.004
urotbrev							51.3	0.015		
urotpose							295.1	0.089	51.3	0.015
Echinodermata										
amphchia					320.8	0.255				
amphfili	2463.4	5.694	667.2	5.126	64.2	0.234	12.8	0.019		

echipusi									12.8	0.007
ophialbi					89.8	0.010				
ophijuve									12.8	0.000
Mollusca										
abraalba									25.7	0.002
abraniti					12.8	0.030				
abrapris					25.7	0.241				
aplacoph	25.7	0.008								
chamstri			51.3	1.237			12.8	0.001		
corbgibb	64.2	0.025	38.5	0.016			89.8	0.038	25.7	0.027
cylicyli	25.7	0.009			25.7	0.013			12.8	0.060
donavitt							12.8	0.013		
dosilupi					25.7	1.125	12.8	0.001		
ensiamer									12.8	0.559
euspniti			51.3	0.024	89.8	0.130	12.8	0.002		
goodtrian							12.8	0.001		
lucibore					12.8	0.709				
mysebide	487.5	0.041	295.1	0.024	25.7	0.003			12.8	0.001
mysiunda					12.8	0.020				
nucuniti	89.8	0.024	25.7	0.162	64.2	0.037			25.7	0.141
phaxapel			12.8	0.019	12.8	0.021	25.7	0.375		
seminiti	38.5	0.002								
spiselli					12.8	0.002				
tellfabu					179.6	0.049	38.5	0.617	38.5	0.326
tellferr							12.8	0.009	12.8	0.006
thraphas	12.8	0.001			25.7	0.007	89.8	0.045	89.8	0.409
thyaflex	64.2	0.053			128.3	0.164				
turrcomm	25.7	1.897								
vitranti					12.8	0.001				
Polychaeta										
aphemari	25.7	0.007								
aphracul			12.8	3.440						
chaeseto	51.3	0.041	12.8	0.003	25.7	0.014	38.5	0.036	12.8	0.010
diplglau	12.8	0.010			38.5	0.020				
eteolong			12.8	0.003						
eumisang									12.8	0.010
gonimacu			12.8	0.003	38.5	0.069	64.2	0.293		
gyptcape									12.8	0.010
harmjuve					12.8	0.007			12.8	0.010
laniconc					12.8	0.659			38.5	1.282
magealle			12.8	0.003	51.3	0.378				
magejohn					154.0	0.081	25.7	0.024	372.1	0.765
magemira			166.8	0.044	307.9	0.163	205.3	0.190	38.5	0.105
malmlunu									25.7	0.020
medifrag	12.8	0.003								
nephassi	25.7	0.427	12.8	0.318					12.8	1.179
nephcirr							64.2	0.113		
nephhomb	38.5	0.281	12.8	0.195						
nephjuve			38.5	0.010	38.5	0.020	12.8	0.012		
nerelong									38.5	1.111
notolate									38.5	5.414
ophiflex			12.8	0.063	12.8	0.039				
pholminu	115.5	0.091	77.0	0.020	25.7	0.014			12.8	0.010
phylrose					25.7	0.014				
poecserp					12.8	0.124			12.8	0.010
polyspec	25.7	0.020								
scalinfl					12.8	0.007				
scolarmi	12.8	0.010	12.8	0.003	64.2	0.034			51.3	0.041
sigamath					64.2	0.686				

spiobomb	25.7	0.007	25.7	0.007	885.3	0.467	115.5	0.107	51.3	0.041
spiofili	12.8	0.003					25.7	0.024	64.2	0.051
spiokroe	12.8	0.003								
sthelimi	12.8	0.010	25.7	0.061	12.8	0.090				
syneklat			25.7	0.007						
Miscellaneous taxa										
edwaclap									12.8	0.048
nemertin	12.8	0.014			64.2	0.051	12.8	0.051	154.0	5.501
turbella	25.7	0.005								
golfjuve	25.7	0.003								
phoronid	320.8	0.119	128.3	0.068	51.3	0.027	243.8	0.097	205.3	0.178
sum	4092.8	12.3	1911.7	12.6	3194.7	6.2	1603.8	2.2	1796.2	18.6
diversity										
nspc	29		30		46		27		37	
SH-W	1.68		2.47		2.94		2.74		3.03	
Simp	0.38		0.16		0.11		0.09		0.07	

station	**OFF 2**		**OFF 3**		**OFF 4**		**OFF 5**		**OFF 6**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc			12.8	0.004						
batheleg			38.5	0.012	51.3	0.015	51.3	0.015	25.7	0.008
bathguil	12.8	0.004			64.2	0.019	38.5	0.012	12.8	0.004
caprelli	77.0	0.023	12.8	0.004	51.3	0.015				
carcmaen									12.8	0.040
diasbrad							12.8	0.004		
iphitris							12.8	0.004		
leucinci			51.3	0.015			12.8	0.004		
megaagil									25.7	0.008
orchnana					12.8	0.004				
perilong					12.8	0.004	12.8	0.004		
pseulong	25.7	0.008					12.8	0.004	12.8	0.004
siphkroy					12.8	0.004	12.8	0.004		
syncmacu			12.8	0.004			12.8	0.004		
thiascut			12.8	0.396						
urotbrev	12.8	0.004	25.7	0.008					25.7	0.008
urotpose	102.6	0.031	12.8	0.004			89.8	0.027	38.5	0.012
Echinodermata										
acrobrac					25.7	0.142				
echicord	25.7	13.595	89.8	43.772	51.3	8.301	38.5	29.751		
echipusi									12.8	0.042
ophialbi			12.8	0.348	51.3	0.479				
ophijuve							12.8	0.001		
ophitext	38.5	13.684	12.8	0.002						
Mollusca										
corbgibb					25.7	0.142				
cylicyli					12.8	0.197	12.8	0.002		
donavitt	12.8	0.069								
euspniti			12.8	0.354	38.5	0.075	89.8	0.160	25.7	0.009
goodtrian									102.6	0.010
macobalt			12.8	0.006						
mysebide			12.8	0.001			12.8	0.001		
nucuniti					12.8	0.254				
phaxapel			12.8	0.040						
tellfabu	307.9	8.357	551.7	11.879	51.3	0.366	102.6	0.248		
tellferr	205.3	0.304	384.9	0.108	38.5	0.020	256.6	0.209		
thraphas					12.8	0.121	12.8	0.159		
turbpusi	12.8	0.013								
Polychaeta										
chaeseto	51.3	0.108	38.5	0.030			38.5	0.056		

eteolong	51.3	0.108			51.3	0.034			25.7	0.024
eumisang	12.8	0.027	51.3	0.041						
gonimacu	12.8	0.066			12.8	0.008				
gyptcape	12.8	0.014	12.8	0.010	25.7	0.017	12.8	0.019		
harmjuve			12.8	0.010			25.7	0.037		
hetefili									12.8	0.012
laniconc			269.4	9.682			51.3	0.075		
magejohn	2938.1	8.683	910.9	1.201	307.9	0.242	282.3	0.410		
magemira	256.6	0.083	282.3	0.064	77.0	0.051	25.7	0.037	12.8	0.012
malmlunu			77.0	0.203						
nephassi							12.8	1.357		
nephcirr	12.8	0.122			51.3	0.034			51.3	0.650
nephhomb	12.8	0.393			12.8	0.278				
nephjuve	25.7	0.054	51.3	0.041					38.5	0.036
notolate					64.2	3.275				
ophelima									12.8	0.012
owenfusi					77.0	0.051				
parafulg									12.8	0.012
poecserp	77.0	0.163					38.5	0.056		
scolarmi	115.5	0.549	141.1	0.442	51.3	0.059	12.8	0.019	38.5	0.036
scolbonn	38.5	0.246					12.8	0.019		
sigamath	12.8	0.445			25.7	0.698	64.2	2.952		
spiobomb	12.8	0.027			25.7	0.017	474.7	0.689	38.5	0.036
spiofili	25.7	0.054	179.6	0.142			25.7	0.037	64.2	0.059
sthelimi					12.8	0.008				
Miscellaneous taxa										
anthozoa					12.8	0.638				
nemertin	77.0	0.285	102.6	1.832	38.5	0.147	51.3	0.260	25.7	0.226
nematoda									77.0	0.005
phoronid			12.8	0.015	38.5	0.030	25.7	0.017	77.0	0.047
sum	4580.3	47.9	3425.6	71.0	1411.3	15.8	1963.0	36.7	782.6	1.4
diversity										
nspc	28		30		32		33		23	
SH-W	1.63		2.49		3.08		2.75		2.91	
Simp	0.42		0.13		0.07		0.10		0.05	

station	**OFF 7**		**OFF 8**		**OFF 9**		**OFF 10**		**OFF 11**	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg	12.8	0.004	64.2	0.019	295.1	0.089	64.2	0.019	38.5	0.012
bathguil	38.5	0.012	12.8	0.004	154.0	0.046	38.5	0.012	25.7	0.008
diasbrad					12.8	0.004	12.8	0.004		
hippdent									12.8	0.004
iphitris							12.8	0.004		
leucinci			25.7	0.008			38.5	0.012		
megaagil	64.2	0.019	25.7	0.008	25.7	0.008	25.7	0.008		
orchnana	12.8	0.004	12.8	0.004						
perilong					25.7	0.008				
pseulong	38.5	0.012			38.5	0.012	12.8	0.004		
siphkroy									12.8	0.004
syncmacu					25.7	0.008	12.8	0.004		
thiascut					12.8	0.862				
urotbrev	51.3	0.015	166.8	0.050	12.8	0.004	64.2	0.019		
urotpose	166.8	0.050	269.4	0.081	51.3	0.015	282.3	0.085		
Echinodermata										
echicord	141.1	68.922	25.7	11.331	25.7	15.510	25.7	19.181	51.3	0.111
ophialbi									12.8	0.026
ophijuve	12.8	0.001								
ophitext					12.8	0.010				
Mollusca										

chamstri	12.8	1.237								
donavitt	12.8	2.338	25.7	0.034	51.3	4.222				
euspniti	89.8	0.019	25.7	0.006	12.8	0.171	25.7	0.009	12.8	0.004
nucuniti									12.8	0.127
tellfabu	12.8	0.003	154.0	4.528			12.8	0.443	89.8	0.055
tellferr	38.5	0.005	51.3	0.048			115.5	0.095		
Polychaeta										
aphemari			12.8	0.007						
chaeseto	12.8	0.015	38.5	0.020	12.8	0.000				
eteolong	12.8	0.015	25.7	0.014	12.8	0.005				
eumisang							25.7	0.041		
gonimacu			25.7	0.149					51.3	0.185
laniconc	25.7	0.030	51.3	0.102			12.8	0.003		
magejohn	38.5	0.046	333.6	0.176			38.5	0.061	115.5	0.076
magemira	89.8	0.107	154.0	0.081	38.5	0.015	25.7	0.041	25.7	0.017
nephassi			12.8	5.015						
nephcirr			12.8	0.007	64.2	0.198	77.0	0.218	51.3	0.034
nerelong	12.8	0.129								
ophelima					12.8	0.005				
phylline			12.8	0.007						
poecserp	12.8	0.015	12.8	0.007						
scolarmi	25.7	0.030	102.6	0.054	179.6	0.574	115.5	0.632	77.0	0.051
scolbonn									12.8	0.088
spiobomb	38.5	0.046	513.2	0.271	38.5	0.015	102.6	0.163	192.5	0.127
spiofili	64.2	0.076	115.5	0.061			12.8	0.020		
Miscellaneous taxa										
nemertin	12.8	0.152	89.8	0.759	12.8	0.048			12.8	0.031
nematoda	12.8	0.002								
phoronid			38.5	0.007					12.8	0.008
branlanc	12.8	0.003								
sum	1077.7	73.3	2412.0	22.86	1129.0	21.83	1154.7	21.1	821.1	2.4
diversity										
nspc	27		28		22		22		18	
SH-W	2.91		2.71		2.51		2.63		2.48	
Simp	0.06		0.09		0.12		0.09		0.10	

station	**OFF 12**		**OFF 13**		**OFF 14**		**OFF 15**		**OFF 16**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc							12.8	0.004		
atylswam	12.8	0.004								
batheleg	38.5	0.012	12.8	0.004	102.6	0.0	25.7	0.008	64.2	0.019
bathguil					64.2	0.0				
diasbrad	12.8	0.004	12.8	0.004						
dyopmona									12.8	0.004
megaagil			12.8	0.004			25.7	0.008		
pseulong	12.8	0.004			38.5	0.0	12.8	0.004	12.8	0.004
syncmacu					12.8	0.0				
urotbrev	12.8	0.004					51.3	0.015	51.3	0.015
urotpose	38.5	0.012	218.1	0.065	115.5	0.0	230.9	0.069	115.5	0.035
Echinodermata										
echicord	12.8	0.065	12.8	2.114	12.8	11.2			25.7	13.871
ophialbi							12.8	0.010		
Mollusca										
abrapris	12.8	0.664								
donavitt	12.8	0.013	25.7	0.059	38.5	0.0	25.7	3.124	38.5	0.016
euspniti	77.0	0.151			64.2	0.1	38.5	0.011		
tellfabu	12.8	0.019	12.8	0.003	38.5	0.0	51.3	0.017		
tellferr			12.8	0.002			25.7	0.017	12.8	0.006
Polychaeta										

aonipauc									12.8	0.014
aricminu	25.7	0.010	25.7	0.020	12.8	0.0	12.8	0.010	12.8	0.014
chaeseto			12.8	0.010	38.5	0.0	38.5	0.030	51.3	0.054
gonimacu	25.7	0.010	12.8	0.010	12.8	0.1				
harmjuve	12.8	0.005			12.8	0.0	12.8	0.010		
lagiexte			12.8	0.078						
laniconc	12.8	0.005								
magejohn	25.7	0.152	25.7	0.117	51.3	0.2				
magemira							12.8	0.010	12.8	0.014
nephcirr	115.5	0.046	154.0	0.332	115.5	0.1	25.7	0.066	77.0	0.259
ophelima			12.8	0.217						
scolarmi	359.2	0.288	38.5	0.256	102.6	0.2	166.8	0.196	115.5	0.931
scolbonn					12.8	0.7				
scolfoli					12.8	0.0				
spiobomb	115.5	0.046	64.2	0.051	77.0	0.1	12.8	0.010	102.6	0.108
spiokroe							12.8	0.163		
Miscellaneous taxa										
nemertin			12.8	0.068			51.3	0.502		
nematoda			12.8	0.002						
branlanc							12.8	0.014		
sum	949.4	1.5	705.7	3.4	936.6	12.8	872.4	4.4	718.5	15.4
diversity										
nspc	19		19		19		21		15	
SH-W	2.22		2.31		2.67		2.52		2.40	
Simp	0.18		0.15		0.07		0.11		0.09	

station	**OFF 17**		**OFF 18**		**OFF 19**		**OFF 20**		**OFF 21**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylswam							12.8	0.004	64.2	0.019
batheleg					12.8	0.004				
euryspin			12.8	0.004					12.8	0.004
megaagil	12.8	0.004			51.3	0.015	64.2	0.019	12.8	0.004
perilong					12.8	0.004				
pseulong	38.5	0.012	12.8	0.004	77.0	0.023	25.7	0.008		
thiascut					12.8	0.862	12.8	1.538		
urotbrev			12.8	0.004						
urotpose					12.8	0.004	12.8	0.004	25.7	0.008
Echinodermata										
echicord							25.7	13.107		
ophijuve									12.8	0.000
Mollusca										
donavitt	12.8	0.030					12.8	0.083		
euspniti			64.2	0.052					12.8	0.002
spiselli			12.8	0.025						
tellferr					12.8	0.001				
tellpygm									51.3	0.025
Polychaeta										
aonipauc	25.7	0.024	38.5	0.030	12.8	0.019	12.8	0.003		
aricminu	12.8	0.012			25.7	0.037	51.3	0.010		
harmjuve			12.8	0.010	12.8	0.019	12.8	0.003		
magejohn					12.8	0.124	12.8	0.003		
magemira			12.8	0.176	12.8	0.166				
nephcirr	25.7	0.108	38.5	0.063	64.2	0.491	102.6	0.423	38.5	1.004
ophelima			12.8	0.005						
parafulg	38.5	0.036	89.8	0.071						
phylrose	12.8	0.012								
scolsqua	25.7	0.515			12.8	0.229	38.5	0.134	12.8	0.112
spiobomb			12.8	0.010	590.2	0.857	192.5	0.039		
spiofili							12.8	0.003		

syllgrac									25.7	0.008
terejuve			12.8	0.007						
Miscellaneous taxa										
anthozoa							25.7	0.014		
nematoda									12.8	0.003
phoronid							936.6	0.511	25.7	0.003
sum	205.3	0.8	346.4	0.5	936.6	2.9	1565.3	15.9	307.9	1.3
diversity										
nspc	9		13		15		17		12	
SH-W	2.10		2.25		1.53		1.59		2.30	
Simp	0.08		0.11		0.41		0.38		0.08	

station	**OFF 22**		**OFF 23**		**OFF 24**		**OFF 25**		**OFF 26**	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg			25.7	0.008						
bathguil							25.7	0.008		
calltyrr			12.8	0.012						
leucinci			51.3	0.015						
megaagil	38.5	0.012	25.7	0.008			102.6	0.031		
ponttris	12.8	0.004								
pseulong	12.8	0.004	12.8	0.004			25.7	0.008		
urotbrev			51.3	0.015						
urotpose	372.1	0.112	423.4	0.127	77.0	0.023	115.5	0.035		
Echinodermata										
echicord	25.7	11.626	12.8	9.057			77.0	14.671		
echipusi									12.8	0.001
Mollusca										
ensiarcu			12.8	35.228						
euspniti	12.8	0.009					12.8	0.002		
spisjuve			12.8	0.001						
Polychaeta										
aonipauc					12.8	0.015			12.8	0.029
aricminu	64.2	0.008					12.8	0.027		
eteolong	25.7	0.003	12.8	0.007			12.8	0.027		
hetefili									12.8	0.029
laniconc			12.8	0.066						
magealle			12.8	0.017						
magejohn									12.8	0.037
nephcirr	51.3	0.344	51.3	0.493	38.5	0.598	115.5	1.507	12.8	0.322
nephjuve	25.7	0.003								
phylgroe			12.8	0.337						
poecserp							12.8	0.027		
scolarmi	12.8	0.036	12.8	0.039						
scolbonn							51.3	1.553	12.8	0.195
Miscellaneous taxa										
nemertin			25.7	0.926			12.8	0.008	12.8	0.443
nematoda							12.8	0.002		
phoronid	154.0	0.034	603.0	0.318						
sum	808.3	12.2	1385.6	46.7	128.3	0.6	590.18	17.92	89.8	1.1
diversity										
nspc	12		18		3		13		7	
SH-W	1.79		1.75		0.90		2.19		1.95	
Simp	0.25		0.28		0.40		0.12		0.00	

station	**OFF 27**		**OFF 28**		**OFF 29**		**OFF 30**		**OFF 31**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc					12.8	0.004				
batheleg					64.2	0.019	51.3	0.015	115.5	0.035
bathguil					51.3	0.015	12.8	0.004	25.7	0.008

calltyrr	12.8	0.878								
dyopmona					12.8	0.004				
hippdent							12.8	0.004		
iphitris					12.8	0.004				
megaagil			25.7	0.008					38.5	0.012
pseulong	12.8	0.004	51.3	0.015	25.7	0.008	25.7	0.008	38.5	0.012
urotbrev							38.5	0.012	12.8	0.004
urotpose	115.5	0.035					307.9	0.092	51.3	0.015
Echinodermata										
echicord					25.7	2.252				
echipusi					102.6	0.087				
ophijuve			25.7	0.001					12.8	0.000
Mollusca										
donavitt									38.5	0.149
ensiamer	25.7	46.954			12.8	8.949				
euspniti					38.5	0.007			12.8	0.004
goodtrian					577.4	0.056				
mysebide					12.8	0.001				
spissoli			12.8	0.905						
tellfabu							64.2	1.287		
thraphas					12.8	0.002				
Polychaeta										
aricminu									179.6	0.042
chaeseto					25.7	0.010			12.8	0.003
eteolong							12.8	0.019		
eumisang					12.8	0.005				
glycjuve					38.5	0.015				
glyclapi			12.8	0.229						
gonimacu							25.7	0.122		
laniconc			12.8	0.002	38.5	0.887	25.7	0.769		
lumblatr					12.8	0.022				
magejohn	12.8	0.100					192.5	0.279	38.5	0.071
magemira							141.1	0.205		
nephcirr	12.8	0.444	51.3	0.086	12.8	0.113			89.8	0.159
nephhomb			12.8	0.163			12.8	0.146		
nephjuve							64.2	0.093	25.7	0.007
parafulg			12.8	0.003					12.8	0.003
poecserp					12.8	0.005				
scolarmi					77.0	0.086			102.6	0.357
scolbonn			12.8	0.269			12.8	0.151		
spiobomb					12.8	0.005			12.8	0.003
spiofili					12.8	0.005			12.8	0.003
syllidae					12.8	0.005				
travforb					25.7	0.312				
Miscellaneous taxa										
anthozoa							12.8	5.990		
nemertin	12.8	2.348	12.8	0.096	38.5	0.209	25.7	0.104		
nematoda					89.8	0.005	12.8	0.003		
branlanc	12.8	0.011								
sum	218.1	50.8	243.8	1.8	1385.6	13.1	1052.1	9.3	833.95	0.89
diversity										
nspc	8		11		27		18		18	
SH-W	1.59		2.21		2.42		2.29		2.51	
Simp	0.27		0.08		0.19		0.14		0.09	

station	**OFF 32**		**OFF 33**		**OFF 34**		**OFF 35**		**OFF 36**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc							12.8	0.004		
atylswam							12.8	0.004		

batheleg	25.7	0.008	51.3	0.015	12.8	0.004				
bathguil	12.8	0.004	25.7	0.008			102.6	0.031	12.8	0.004
calltyrr	38.5	3.250	128.3	19.459			12.8	3.435		
diasbrad	12.8	0.004					12.8	0.004		
hippdent			12.8	0.004						
ionethor							12.8	0.075		
leucinci	25.7	0.008	12.8	0.004	12.8	0.004				
megaagil	12.8	0.004			64.2	0.019	38.5	0.012	25.7	0.008
orchjuve			25.7	0.008						
perilong	12.8	0.004	12.8	0.004						
pseulong	25.7	0.008	12.8	0.004	25.7	0.008	12.8	0.004	25.7	0.008
thiascut			12.8	0.441						
urotbrev			25.7	0.008	25.7	0.008				
urotpose	12.8	0.004	64.2	0.019	282.3	0.085	25.7	0.008		
Echinodermata										
amphfili			346.4	0.081						
echicord	38.5	14.920	12.8	3.587	25.7	10.766	12.8	11.986		
echipusi			12.8	0.145						
ophialbi					12.8	0.959				
Mollusca										
alvalact			192.5	0.192						
diplrotu			25.7	0.742						
donavitt					25.7	0.043				
euspniti			25.7	0.169					12.8	0.002
goodtrian									12.8	0.001
mysebide	25.7	0.001								
polyplac			102.6	0.051						
strilact			12.8	0.001						
tellfabu	38.5	0.001								
tellferr					25.7	0.016				
tellpygm									102.6	0.014
torusubc			51.3	0.026						
Polychaeta										
aphemari					12.8	0.008				
aricminu	12.8	0.017			51.3	0.034	25.7	0.017		
chaeseto			77.0	0.020	38.5	0.025				
eteolong			38.5	0.010						
euzoflab									51.3	0.020
exoghebe			102.6	0.027						
glycjuve							12.8	0.008	25.7	0.010
hetefili			128.3	0.032						
laniconc			12.8	0.003						
nephcirr	25.7	0.185	102.6	1.048	51.3	1.130	64.2	0.330	51.3	0.427
nephjuve			51.3	0.014	25.7	0.017				
ophejuve							12.8	0.003		
ophelima									12.8	0.005
pholminu			551.7	0.141						
scolarmi	141.1	0.835	102.6	0.234	12.8	0.034				
scolbonn	12.8	0.017	12.8	0.244			12.8	0.215		
spiobomb			89.8	0.024	1231.7	3.658	12.8	0.008		
spiofili	12.8	0.017	25.7	0.007						
syllgrac			51.3	0.014						
Miscellaneous taxa										
anthozoa			89.8	0.068						
nemertin	12.8	0.330	51.3	0.669	25.7	0.147	12.8	0.048	12.8	0.008
nematoda			102.6	0.029						
phoronid	333.6	0.271	808.3	0.440			333.6	0.332		
molgocul			25.7	0.032					38.5	0.010
branlanc			12.8	0.167						

sum	834.0	19.9	3605.2	28.4	1963.0	17.0	744.1	16.5	384.9	0.6
diversity										
nspc	19		39		18		18		12	
SH-W	2.21		2.90		1.51		2.07		2.23	
Simp	0.19		0.09		0.41		0.22		0.11	
station	**COA 1**		**COA 2**		**COA 3**		**COA 4**		**COA 5**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc	25.7	0.008								
atylswam			25.7	0.008					25.7	0.008
batheleg	38.5	0.012							51.3	0.015
bathguil									64.2	0.019
diogpugi			12.8	0.038					12.8	0.142
harpante							12.8	0.004		
perilong	12.8	0.004			25.7	0.008				
pontalta							12.8	0.004		
procspec							25.7	0.008		
pseulong									12.8	0.004
syncmacu									12.8	0.004
urotbrev	12.8	0.004	128.3	0.038	89.8	0.027	64.2	0.019	51.3	0.015
urotpose	25.7	0.008	885.3	0.266	205.3	0.062	320.8	0.096	898.1	0.269
Echinodermata										
amphjuve							89.8	0.000	25.7	0.001
echicord			64.2	56.886	25.7	27.338				
ophialbi					25.7	0.365				
Mollusca										
bivainde							12.8	0.000		
donavitt									51.3	0.008
ensiamer			2643.0	143.86	500.4	34.075	102.6	38.679	12.8	3.016
euspniti					25.7	0.023				
hyalvitr							12.8	0.013		
macobalt	12.8	0.015	141.1	0.997			25.7	0.687		
mactcora									12.8	0.009
mysebide	25.7	0.002			141.1	0.011	64.2	0.014	77.0	0.006
nucutenu							25.7	0.006	12.8	0.002
sphebing					12.8	0.010				
spissubt					410.6	34.109			51.3	0.008
tellfabu	154.0	3.540	115.5	4.155	51.3	1.893	128.3	2.536	102.6	3.211
tellferr	38.5	0.018	526.0	0.347	12.8	0.011				
thyaflex							12.8	0.001		
Polychaeta										
capicapi									64.2	0.032
chaeseto	64.2	0.053								
eteolong	12.8	0.010							12.8	0.007
eumisang									12.8	0.007
laniconc	12.8	0.493					166.8	0.020	436.2	4.451
magejohn	25.7	0.012							12.8	0.007
magemira	218.1	0.423							461.9	0.991
nephassi					12.8	1.919	12.8	1.257		
nephcaec			12.8	0.025	12.8	0.320				
nephcirr			64.2	0.318	25.7	0.049			102.6	0.051
nephhomb					12.8	0.432	102.6	5.844	89.8	0.408
nephjuve	12.8	0.010			38.5	0.029	12.8	0.002		
nephlong			12.8	0.295						
nerelong					12.8	0.510			12.8	0.127
owenfusi					12.8	0.012				
pholminu							12.8	0.002		
scolarmi	846.8	3.853			12.8	0.012			12.8	0.007
scolbonn									12.8	0.154

sigamath									12.8	0.007
spiobomb	12.8	0.010	12.8	0.025	25.7	0.024			128.3	0.064
spiofili	12.8	0.010	12.8	0.025			51.3	0.007		
Miscellaneous taxa										
anthozoa					12.8	30.673	333.6	0.113		
nemertin	12.8	0.079							38.5	0.102
phoronid					38.5	0.078				
sum	1578.1	8.6	4657.3	207.29	1744.9	132.0	1603.8	49.3	2886.8	13.152
diversity										
nspc	19		14		23		21		30	
SH-W	1.77		1.41		2.28		2.83		2.43	
Simp	0.32		0.37		0.16		0.18		0.15	

station	**COA 6**		**COA 7**		**COA 8**		**COA 9**		**COA 10**	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg	12.8	0.004								
bathguil					12.8	0.004				
diasbrad	38.5	0.012								
diogpugi									12.8	0.108
orchnana							12.8	0.004		
pseulong	12.8	0.004							12.8	0.004
siphkroy							12.8	0.004		
syncmacu	51.3	0.015	64.2	0.019	12.8	0.004				
urotbrev	64.2	0.019			102.6	0.031	12.8	0.004	51.3	0.015
urotpose	461.9	0.139	25.7	0.008	1000.7	0.300	295.1	0.089	179.6	0.054
Echinodermata										
echicord	38.5	15.636			12.8	13.669	12.8	5.649		
ophijuve					25.7	0.000				
Mollusca										
donavitt					77.0	14.015				
ensiamer					692.8	86.839	12.8	9.914	25.7	2.280
euspniti							38.5	0.966		
macobalt	89.8	1.844								
mysebide							474.7	0.080	25.7	0.005
spissubt	64.2	4.534			12.8	0.016	2065.6	183.41		
tellfabu	89.8	2.777			77.0	1.303	38.5	1.342	115.5	2.093
tellferr	718.5	0.320			12.8	0.001	12.8	0.001		
Polychaeta										
capicapi					77.0	0.083			12.8	0.017
chaeseto					12.8	0.014				
eteolong							12.8	0.013		
harmjuve	12.8	0.010								
laniconc	25.7	0.381			25.7	0.764				
magejohn	25.7	0.020			25.7	0.027				
magemira	38.5	0.030	834.0	4.380	12.8	0.014	25.7	0.025	25.7	0.036
nephassi					25.7	4.398				
nephcaec	38.5	3.103							12.8	0.234
nephcirr	51.3	0.152	38.5	0.349			12.8	0.013	38.5	0.176
nephhomb	51.3	0.203	12.8	0.017					64.2	2.061
nephjuve							12.8	0.013	12.8	0.017
nerelong							12.8	1.490		
owenfusi									12.8	0.017
parafulg									12.8	0.017
scolarmi									12.8	0.017
sigamath									12.8	3.929
spiobomb	38.5	0.030			12.8	0.014	12.8	0.013	64.2	0.086
spiofili	154.0	0.119					25.7	0.025	38.5	0.053
spiokroe									12.8	0.017
sthelimi							25.7	0.466		

Miscellaneous taxa										
anthozoa	12.8	0.006					12.8	4.256		
sum	2091.3	29.51	975.1	4.8	2232.4	121.6	3143.4	207.9	757.0	11.3
diversity										
nspc	21		5		18		20		20	
SH-W	2.25		0.59		1.66		1.28		2.57	
Simp	0.18		0.73		0.30		0.46		0.09	

station	**COA 11**		**COA 12**		**COA 13**		**COA 14**		**COA 15**	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc			12.8	0.004						
atylswam									12.8	0.004
batheleg									12.8	0.004
bathguil	25.7	0.008							12.8	0.004
carcmaen							12.8	0.876		
orchnana									12.8	0.004
siphkroy			12.8	0.004						
syncmacu					154.0	0.046				
urotbrev	64.2	0.019					89.8	0.027	128.3	0.038
urotpose	256.6	0.077	12.8	0.004			141.1	0.042	975.1	0.293
Echinodermata										
amphjuve	12.8	0.001								
echicord	12.8	9.737								
ophialbi							38.5	0.168		
ophitext							12.8	0.210		
Mollusca										
ensiamer	154.0	18.537	307.9	56.583			64.2	18.974	243.8	18.609
euspniti									12.8	0.002
modijuve									12.8	0.002
mysebide	38.5	0.010	12.8	0.001			1462.6	0.287	38.5	0.006
tellfabu	25.7	0.645					192.5	2.698	192.5	3.146
tellferr	64.2	0.032	38.5	0.007						
Polychaeta										
capicapi							115.5	0.054		
eteolong			12.8	0.080						
harmjuve									25.7	0.039
laniconc	12.8	0.061							25.7	0.130
magejohn			12.8	0.080					25.7	0.039
magemira			51.3	0.322					12.8	0.020
nephcaec									25.7	1.875
nephcirr	77.0	0.489	51.3	0.496			12.8	0.007		
nephhomb							38.5	1.484	25.7	0.644
nephjuve			12.8	0.080						
nerelong							51.3	1.958		
notolate							64.2	2.544	12.8	0.842
pholminu							12.8	0.007		
phylgroe			25.7	0.161						
phylline									12.8	0.020
scolarmi	25.7	0.122	25.7	0.161			25.7	0.181	12.8	0.020
scolbonn	12.8	0.061	12.8	0.080	12.8	0.034				
sigamath									12.8	0.020
spiobomb			12.8	0.080			603.0	1.001	102.6	0.156
spiofili									12.8	0.020
Miscellaneous taxa										
oligocha							51.3	0.024		
nemertin									25.7	0.183
sum	782.6	29.8	615.8	58.3	166.8	0.1	2989.4	30.7	1988.7	26.2
diversity										
nspc	13		15		2		17		24	

SH-W	2.08	1.92	0.27	1.78	1.97
Simp	0.16	0.26	0.85	0.29	0.27

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