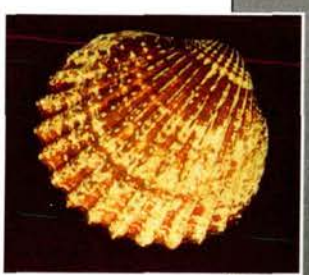
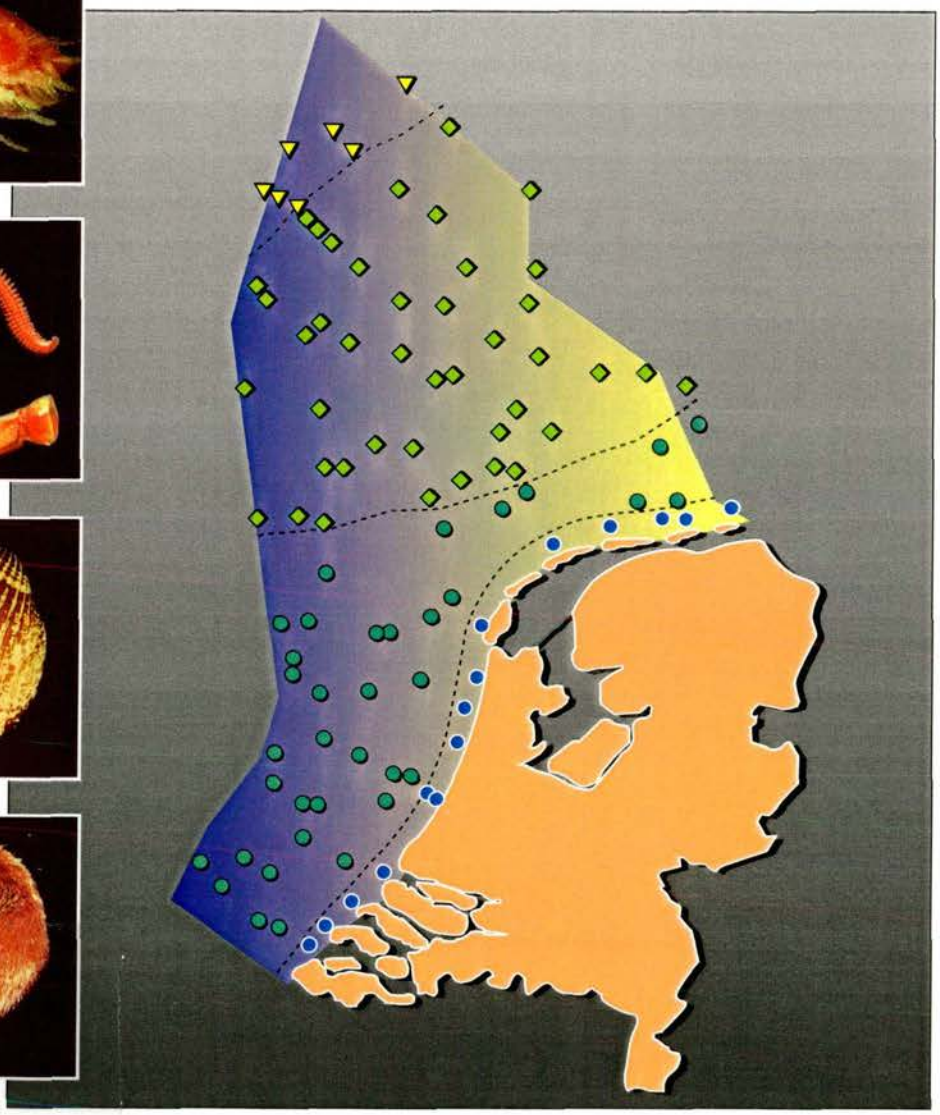
NIOZ-RAPPORT 2000 - 7

THE MACROBENTHIC FAUNA IN THE DUTCH SECTOR OF THE NORTH SEA IN 1999 AND A COMPARISON WITH PREVIOUS DATA

R. Daan and M. Mulder





erlands Instituut voor Onderzoek der Zee

ring Macrozoobenthos of the North Sea

1. SUMMARY

In this report the results are presented of a macrobenthos survey on the Dutch Continental Shelf (DCS), carried out in spring 1999. The survey forms part of the 'Biological monitoring programme 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 programme 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 takes place every year in spring. In 1999 the 100 BIOMON stations were sampled in the period between March 4 to April 29. On the basis of the results collected in 1999 and previous years an analysis is made of the trends and fluctuations of some selected species and of basic community attributes over the period 1986-1999. 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 assessed 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. On the basis of data obtained in previous years the idea has existed that during the nineties there had been an overall (slight) decrease in the mud contents of bottom sediments on the DCS. However, we found that in the period 1994 – 1998 mud contents have been quantified on the basis of the fraction mineral particles 16 – 63 μm, whereas in the period 1991-1993 the total fraction mineral particles <63 μm was calculated, so including the fraction < 16 μm. The latter fraction generally appears to contribute sustantially to the total fraction <63 μm. If we consider the total fraction <63 μm, the mean mud contents of sediments in the four subareas in 1999 appear to be not different from those in the early nineties. When we look at the fraction 16-63 μm the mean mud values in 1999 appear to be not different from those in the period 1994-1998. Thus, there has not been an overall change in mud contents of sediments during the nineties. At individual stations mud contents may be highly variable, not only due to temporal fluctuations but also to local variation.
2. Although there is n't an overall change in the total biomass per m2 in the four subareas of the DCS there seems to have been a shift in the contribution of the different taxonomic groups to the total fauna density and biomass. In all subareas a slight decrease can be observed in the abundance of molluscs. Particlarly adult specimens of the larger species are sparsely found in boxcore samples.

3. In the highly diverse Dogger Bank area, the abundances of individual species were quite variable between 1986 and 1999. In 1992-1994 peak densities were observed after which there was a period of low densities between 1995 and 1998. In 1999 there was an overall increase in faunal densities, mainly due to the increase of the brittle star *Amphiura chiajei* and the amphipods *Bathyporeia elegans* and *Urothoe poseidonis*. A decrease was observed in the gastropod *Natica alderi* in recent years.
4. In the Oyster Ground a strong decrease has been observed in the brittle star *Amphiura filiformis* from 1993 onwards and in 1999 there was not any sign of recovery of the *A. filiformis* population. Particularly in the Frisian Front area dramatic reductions were found in the abundance of this species compared to the period before 1993, *when A. filiformis* was a dominant species in this area. It is discussed that a local change in mud contents can not be the cause, since these were still the highest at the Frisian Front.
5. Particularly in the offshore area a decrease in the abundance and biomass of molluscs can be observed from 1994 onwards. Of those bivalve species which potentially can reach a large size only juvenile specimens were found. This may indicate that, although there is settlement of new generations, there is a low survival rate and hardly any chance for this young generations to build up new vital adult populations. The gastropod *Natica alderi* also showed a decrease after 1994.
6. The major trends in the coastal area are more or less the same as in the offshore area: an overall decrease of molluscs, including the gastropod *Natica alderi*.

2. SAMENVATTING

In dit rapport worden de resultaten gepresenteerd van een macrobenthos bemonstering die in 1999 werd uitgevoerd op het Nederlands Continentale Plat (NCP). De bemonstering vond plaats in het kader van het 'Biologische Monitoring Programma Zoute Wateren' (MON*BIOLOGIE, gewwonlijk 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 effecten van anthropogene activiteiten (bijv. eutrofiëring, verontreiniging, boomkorvisserij).

In het kader van dit project wordt jaarlijks veldonderzoek uitgevoerd in het voorjaar. In 1999 zijn de 100 BIOMON stations tussen 4 maart en 29 april bemonsterd. Aan de hand van de gegevens die in 1999 en voorgaande jaren zijn verzameld is een overzicht verkregen van de trends en fluctuaties bij een aantal geselecteerde soorten en kenmerken van de benthische gemeenschap over de periode 1986 - 1999. 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. Op basis van gegevens die in voorgaande jaren zijn verzameld heeft de indruk bestaan dat zich gedurende de negentiger jaren een algehele afname had voorgedaan in het slibgehalte van sedimenten op het NCP. In dit rapport wordt echter geconstateerd dat in de periode 1994 t/m 1998 slibgehalten zijn gekwantificeerd aan de hand van de fraktie minerale delen 16-63 µm, terwijl in de periode 1991-1993 daarvoor de totale fraktie minerale delen <63 µm is gebruikt, dus inclusief de fraktie <16 µm. Deze laatste fraktie blijkt doorgaans een substantiele bijdrage te leveren aan de totale fraktie < 63 µm. Wanneer we slib definiëren als de fraktie <63 µm dan blijkt dat er geen verschil is tussen het gemiddelde slibgehalte van sedimenten in de vier subgebieden in 1999 en dat in de beginjaren '90. Wanneer we slib definiëren als de fraktie 16-63 µm, dan blijken de gemiddelde waarden in 1999 niet af te wijken van die in de periode 1994-1998. Er heeft zich gedurende de negentiger jaren dus geen algehele afname in slibgehalten voorgedaan.
2. Hoewel er geen algehele verandering is in de hoeveelheid biomassa per m^2 in de vier subgebieden van het NCP, lijkt er een verschuiving te zijn opgetreden in de bijdrage die de verschilllende taxonomische hoofdgroepen daaraan leveren. In alle

subgebieden was een zekere afname te constateren in de abundantie en biomassa van mollusken. Vooral volwassen exemplaren van de grotere soorten worden tegenwoordig maar zelden in boxcore monsters aangetroffen.

3. Op de Doggersbank, het biologisch meest diverse gebied, waren de aantallen van de afzonderlijke soorten in het algemeen zeer variabel tussen 1986 en 1999. In de periode 1992-1994 werden over het algemeen de hoogste dichtheden waargenomen waarna een periode van lage dichtheden volgde van 1995 tot 1998. In 1999 was er weer een algehele toename van fauna-dichtheden, hoofdzakelijk als gevolg van een toename van de slangster *Amphiura chiajei* en de amphipoden *Bathyporeia elegans en Urothoe poseidonis*. Bij de gastropode *Natica alderi* werd gedurende de afgelopen jaren een afname geconstateerd.
4. In de Oester Gronden is sedert 1993 een sterke afname waargenomen bij de slangster *Amphiura filiformis*. In 1999 was er nog geen enkel teken van herstel van *de A. filiformis* populatie. Met name op het Friese Front, waar *A. filiformis* vroeger de dominante soort was, was de afname dramatisch. Een eerder gesuggereerde verandering (afname) in slibgehalte kan niet als oorzaak worden aangemerkt. Slibgehalten waren nog steeds het hoogst in de sedimenten op het Friese Front.
5. Met name in het offshore gebied kan vanaf 1994 een afname worden geconstateerd in de talrijkheid en biomassa van mollusken. Van de grotere soorten werden vrijwel alleen juveniele stadia gevonden. Dit wijst er op dat, hoewel er kennelijk settlement is van nieuwe generaties, deze maar een geringe overlevingskans hebben en zich niet ontwikkelen tot levensvatbare populaties van volwassen dieren. De *gastropode Natica alderi* vertoonde ook een afname vanaf 1994.
6. De belangrijkste trends in het kustgebied zijn min of meer dezelfde als die in het offshore gebied: een algehele afname onder mollusken, inclusief de gastropode *Natica alderi*.

3. Introduction

In 1989 the **BIO**logical **MON**itoring programme of marine waters (project MON* BIOLOGIE) was started with the goal to study the temporal variation of the marine ecosystems in the Dutch Continental Shelf (DCS) including the Wadden Sea and the Delta area (Dekker & de Bruin, 1998). 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 programme comprises besides the macrobenthos also plankton, fish, seagrass, hard substrate populations, seabirds and mammals.

This report presents the data from the macrobenthos survey carried out in spring 1999. Further the results of the 1999 survey are compared with the BIOMON data collected in previous years (1991-1998) and those obtained during the ICES North Sea Benthos Survey (ICES-NSBS, 1986), the MILZON-BENTHOS programme (1988-1993) and some unpublished data collected at the Dogger Bank in 1986/1987 (Heyman, unpubl.). 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 programme 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. Athough 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. 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 (Holtmann et al., 1999) has shown that there were generally no clear trends in community attributes (faunal density, biomass, biodiversity parameters) in the 4 subareas. However, at the species level there seemed to be some trend like changes. In the Oyster ground there was a downward trend in the abundance of the brittle star *Amphiura filiformis*, the bivalve *Mysella bidentata* and

the burrowing shrimp *Callianassa subterranea* from 1992 onwards. In the same period there was a decrease of the polychaete *Nephtys cirrosa* and the gastropod *Natica alderi* in the offshore and coastal areas. In the latter area there also seemed to be a decrease in the abundance of the sea urchin *Echinocardium cordatum* and the bivalve *Tellina fabula*. The new data will show to what extent the apparent trends observed in previous years continued in 1999.

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 1999 the 100 selected stations were sampled in the period 9 March to 29 April. Nearly all stations were visited with the RV. Mitra (North Sea Directorate, RWS), except for two stations in the Coastal subarea with a water depth less than 10 m, *viz. COA 13* & *14*. These stations were sampled on 25 March 1999 with the RV. Delta (RWS).

In Fig. 1 an overview of the sampling stations in 1999 is given. The geographical positions of the 100 stations, together with the former station 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 RV. Mitra and the weather conditions during this part of the survey in 1999 can be found in the cruise report of Rijkswaterstaat (Anonymous, 1999).

4.2. Sample treatments

At each station shown in Fig. 1 two boxcore samples (0.068 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 pooled subsamples (3.4 cm ∅, depth 10 cm) were 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, hydrozoans, 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 distribution of the sample 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 analysed 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:

Characterisation of the sedimenttype according to the median grain size (after Gullentops *et al.*, 1977).

< 175 μm	Very fine sand
175 - 250 μm	Fine sand
250 - 300 μm	Fine-medium sand
300 - 350 μm	Medium-coarse sand
> 350 μm	Coarse sand

5. Results

5.1. Sediment composition

The median grain size and mud content of the sediment at the stations sampled are listed in Table 1 and spatial patterns are illustrated in Fig. 2 and 3. Mean values for the four subareas are given in Table 2. The values for total mud content (mineral parts <63 μm)

are generally higher than in preceding years. This does not mean that the mud content has increased compared to previous years. The reason is that in previous years the mud content was calculated as the fraction mineral parts between 16 and 63 μm. When only this fraction is considered there appear to be no differences with preceding years. However, the fraction of mineral parts < 16 μm generally contributes a substantial or even major part of the total mud content and should therefore be included. As Fig. 3 shows, the highest mud contents (up to 36 %) occur in the Frisian Front area. High values are also found in the center of the Oyster Ground. Since the grain size fraction > 63 μm mainly consists of fine to very fine sand, the median grain size of the sediment in these areas is generally not more than 100 – 150 μm. Low mud contents, in the order of 0.2–3% are found a the Dogger Bank, the Offshore area and the Coastal area. Here the median grain size is generally in the order of 175 – 300 μm, *i.e.* fine to medium fine sand. However in the offshore area grain size does gradually increase in southern direction and very coarse sand with a median grain size up to 500 μm can be found at the southernmost stations. This spatial pattern in the grain size distribution is almost the same as in 1998.

According to Holtmann *et al.* (1999) there seemed to have been an overall decrease in the mud content of sediments in all subareas in the first half of the nineties, which resulted in a slight increase of the median grain size in the same period. After 1995 the sediment composition stabilized. The authors noticed that methodological developments in the grain size analysis over the period considered complicated the comparison between recent data and those collected in previous years (see Zonneveld, 1994). However, there seems another major reason for the decrease as suggested by Holtmann et al. (1999), since the authors quantified the mud content as the fraction 16-65 μm in the period 1994-1998, whereas in previous years (up to 1993) the mud content was defined as the total fraction <63 μm (Duineveld 1992, Duineveld & Belgers, 1993; 1994). When we consider the total fraction < 63 μm as mud, it appears that the values found in 1999 are of the same order as in the early nineties. When we consider only the fraction 16-63 μm, the mean values in 1999 for the 4 subareas appear not to be different from those in the period 1994-1998. This indicates that there have been no structural changes over the period 1990 – 1999.

5.2. Distribution of the macrobenthic fauna in 1999

5.2.1 Diversity, density and biomass

A total number of 193 species/taxa were identified in the 100 boxcore samples in 1999, including 14 juvenile species (identified to genus level only) and 10 higher taxa (not

identified to species level). 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 of macrobenthic abundance, biomass and diversity are listed in Appendix-2.

The mean number of species per sample (Hill 0) was, like in previous years, the highest on the Dogger Bank and the lowest in the coastal and offshore area (Table 2, Fig. 4). There is an overall gradient of high species richness in the North to low species richness in the south. In neither of the subareas a clear long term trend could be observed in species richness. A station that in previous years has been found to be extremely poor in its number of species is COA 13, west of Noord-Beveland. Upto 1998 the number of species was usually 3 per sample. In 1999 only one (polychaete) species was found at this station.

The highest Shannon Wiener diversity was also observed at the Dogger Bank, whereas Simpson's dominance was the lowest in this area (Table 2, Fig. 8,9). Numbers of individuals are more or less equally distributed over the different species and there are no species which strongly dominate the fauna community by number. The lowest Shannon Wiener diversity was found in the coastal area, however the differences with the offshore area and the Oyster Ground were small in 1999. The highest values for the Simpson index were also found in the coastal area. The fauna at coastal stations are often numerically dominated by one single species, *e.g.* the bivalve *Spisula subtruncata*.

The total fauna density was by far the highest at the Dogger Bank in 1999 (Table 2). The number individuals per m^2 at the Dogger Bank were twice as high as in the Oyster Ground and 4 times as high as in the Offshore area. A general trend exists of decreasing faunal densities from north to south (Fig. 5). Between 1996 and 1999 there was a gradual increase in faunal densities at the Dogger Bank from 2200 to over 3200 individuals per m^2 (Fig. 10). In the Oyster Ground and the Coastal area the overall densities were quite stable in this period, whereas in the offshore area there seemed to be a slight decrease. The increase at the Doggerbank could be observed in polychaetes, crustaceans and echinoderms (Fig.12). In the Oyster Ground a decrease in mollusc abundance was compensated by a slight increase of the other taxonomic groups (Fig. 13). In the offshore area the decrease in faunal abundance was mainly due to lower abundance of molluscs and polychaetes.

The biomass values did not substantially change in the 4 subareas compared to previous years (Fig. 11). In the Oyster Ground biomass values were still low compared to first half of the nineties. The highest mean biomass was found in the coastal area, but this area also showed the strongest variation in biomass. Both the highest and lowest values were found in the coastal area (Fig. 6). An extremely high biomass value of 130 g AFDW per m^2 was found at station COA 5, west from Texel, where a dense population of Spisula

subtruncata occurred. On the other hand a value of almost 0 g AFDW per m2 was found at station COA 13, west of Noord-Beveland. The differences in biomass values between stations were the lowest at the Dogger Bank.

With respect to the contribution of the different taxonomic groups to the total fauna biomass there seems to have been a shift in recent years (1997-1999) in some areas (Fig. 16-19). At the Dogger Bank there was a decrease of mollusc biomass, which was compensated for by an increase of the biomass of the other taxa. In the Oyster Ground mollusc biomass also seems to have decreased, but the share of this group has always been small in this area. In the offshore area polychaete and mollusc biomass slightly decreased, but crustacean biomass increased. In the coastal there was a slight overall decrease in the abundance of molluscs during the ninties.

5.2.2. Temporal variation in density and biomass of selected species

Figs. 20-23 illustrate the temporal variation in density or biomass of a number of individual species in the 4 subareas during the period 1986-1999.

Dogger Bank (Fig. 20a/b)
On the Dogger Bank the mean densities of most species seem to be quite stable over the longer term and most of the year to year fluctuations do not show a trendlike development. The densities in 1999 of the sand star *Acrocnida brachiata*, the bivalves *Mysella bidentata* and *Tellina fabula*, and the polychaetes *Magelona papillicornis* and *Nephtys cirrosa* were well within the range of those found in previous years. *Magelona papillicornis* has been found from 1995 onwards in higher abundance than in the period before. The amphipod *Bathyporeia elegans* showed a dip in the period 1995 – 1997 but its numbers recovered in 1998 and 1999. An overall decrease can be observed in the gastropod *Natica alderi* in recent years.

Oyster Ground (Fig. 21a-b)
In previous years a decining trend has been observed in the brittle star *Amphiura filiformis*, a species characteristic of the Oyster Ground (Holtmann et al., 1999). The decline started in 1993 and continued upto 1998. In 1999 the densities of *A. filiformis* were unvariably low compared to the period before 1993. Similar trends were observed in the burrowing shrimp *Callianassa subterranea* and the polychaete *Nephtys hombergii*. However, *C. subterranea* occurred in peak densities in the early nineties, after a strong increase in the years before. The mean density in 1999 was at a same level as in 1986. A slight decrease can also be observed in the densities of the sea urchin *Echinocardium cordatum* after 1993. The mean density of this species was in 1999 still at a lower level

than before 1993. In contrast, there seemed to be no trendlike change of the biomass of *E. cordatum* in the area. This suggests that the lower number of individuals per m^2 after 1993 were on average of a larger size. No trendlike changes were found in the Oyster Ground for the gastropod *Natica alderi* and the bivalve *Nucula turgida*.

Offshore area (Fig. 22a-b)
In recent years, the highest mean densities of the sea urchin Echinocardium cordatum occur in the offshore area. There seem to have been no substantial changes in the abundance of E. cordatum between 1986 and 1999. Fig. 22a suggests that there has been a strong peak in 1989, but in that year only 4 stations were sampled, which may have been too few to obtain a reliable estimate for the mean density of the species in the whole area. The (small) fluctuations in *E. cordatum* biomass in the same period follow an almost identical pattern. The bivalve *Tellina fabula* and the polychaetes *Magelona papillicornis* and *Scoloplos armiger* showed a similar pattern E. cordatum: overall stable densities between 1986 and 1999, with an incidental peak in 1989. Since these 3 species are all, like *E. cordatum*, herbivorous filter- or deposit-feeders, this could indicate that 1989 has been a favourable year for this trophic group in the offshore area. The other 3 species represented in fig. 22 are all carnivorous and do not show a peak in 1989. The amphipod *Bathyporeia elegans* shows a slight increasing trend over the whole period. The gastropod *Natica alderi* and the polychaete *Nephtys cirrosa* occurred in the highest abundance in the first half of the nineties and gradually decreased from 1994 onwards.

Coastal area (Fig. 13a-c)
The sea urchin *Echinocardium cordatum* occurred in the coastal area in the highest abundance in the early nineties and gradually decreased afterwards, both in numbers and biomass. In 1998 and 1999 there was a slight recovery. Densities of the amphipod *Urothoe poseidonis*, the bivalve *Spisula subtruncata* and the gastropod *Natica alderi* follow a similar pattern. Natica alderi has become, from 1993 onwards, a more or less rare species in boxcore samples. The bivalves Mysella bidentata and Tellina fabula were relatively stable in their abundance between 1986 and 1999. Still, there was a slight overall decrease in mollusc abundance durin the ninties. Finally, the polychaete Nephtys cirrosa showed a quite abrupt decrease in 1996 and was found in stable low densities upto 1999.

6. Discussion and conclusions

The major aim of the macrobenthos monitoring programme is to determine whether there are trend-like changes in the benthic community over the longer term. In principle such changes can occur on an DCS (or even wider) scale or within certain subareas of the DCS. Since the fauna composition of the benthic communities living in the four subareas of the DCS is strongly related to sediment composition (e.g. Duineveld, 1992, Creutzberg, et al., 1984) it is of interest to see if there are consistent changes in the sediment composition. After the previous survey carried out in 1998 Holtmann et al. (1999) suggested that there has been a decrease in the percentage mud of sediments in all subareas in the period 1992 – 1995, after which the mud contents stabilized. However, there are two complicating factors in the interpretation of the data. The first is that it is not clear whether the methods have been always exactly the same over the period considered. The second is that confusion has existed about the way how mud is defined. In fact mud can be considered as a collective term for mineral particles in 3 size ranges, i.e. 0-2 μm ('clay'), 2-16 μm (cohesive silt) and 16-63 μm (non cohesive silt). In the analytical method used by RIKZ –Middelburg the fraction of mineral particles <16 μm is determined separately, whereas the fraction 16-63 μm is determined by Malvern laser diffraction as percentage of the total fraction of mineral particles >16 μm. In their reports Holtmann et al. (1995-1999) used this 16-63 μm fraction to quantify the mud contents in the sediment in the period 1994-1998. However, we verified that in the preceding years (1991-1993) mud was quantified as the total mineral fraction <63 μm, so including the fraction <16 μm (Duineveld,1992, Duineveld & Belgers, 1993; 1994). It is not surprising, therefore, that the values found by the latter authors were generally at a higher level than those presented for the period 1994-1998. We prefer to use the total fraction mineral parts < 63 μm to quantify the mud contents of sediments. Particularly in the sandy subareas (Dogger Bank, offshore and coastal area), where the fraction 16-63 μm was almost or completely absent at most stations in recent years, including 1999, the fraction <16 μm, although small, appeared to be nearly always present at the same stations, generally in concentrations of 0.2-2 %. When we compare the total mud fractions found in 1999 with those found up to 1993, there appear to be no overall differences. On the other hand, when the fraction 16-63 μm as found in 1999 is compared with the values found in the period 1994-1998 there also appear to be no differences. This suggests that there has been no overall change in the mud content of sediments over the past ten years.

For reasons of comparability, we have presented mud data of the 1999 survey in two ways, *i.e.* as the fraction 16-63 μm and as the total fraction <63 μm. When looking at the 16-63 μm fraction there appeared to be no difference in the mean mud content of the four subareas compared to 1998. However, when the individual stations are considered

there appear to be large differences between both years, as shown for the Oyster Ground stations in Fig. 24b. The variability should probably only partly be explained by temporal variability in the rates of sedimentation and resuspension of this particle range. An additional cause may be that there is considerable local variation even within one station. When the total fraction <63 μm is considered (Fig.24a) the correlation between mud contents in 1998 and those in 1999 appears to be much stronger. The figure also illustrates that there is no change in the overall mean mud contents of the sediment in the Oyster Ground.

Although, at the community level, there are always clear fluctuations in species composition and total fauna density, particularly due to variation in the abundance of a number of short-living species, there seems to be no substantial change in the total biomass per m^2 in the four subareas. In recent years, however, there seems to have been a slight shift in the contribution of the different taxonomic groups to the total fauna density and or biomass. On the Dogger Bank, in the Oyster Ground and the offshore area as well the contribution of molluscs decreased. Particularly larger specimens of bivalve species like *Mactra corallina, Dosinia spp., Mysia undata* and *Arctica islandica* are sparsely found in the boxcore samples. But also the carnivorous gastropod *Natica alderi* (which feeds on bivalves) showed an overall decrease, including the coastal area. Such a decrease of *N.alderi* in recent years has also been observed west of the coast of Zuid-Holland (between Hoek van Holland and Den Haag), during an extensive sampling programme with a Triple-D benthos dredge (Daan *et al.,* 2000). Particularly on the Dogger Bank and in the offshore area the decrease of mollusc density and biomass was compensated by an increase in crustaceans, mainly amphipods. It is not clear yet whether this development represents a consistent trend or only a temporary shift in the contribution of the different taxa to the macrobenthic biomass.

When we look at the individual cluster areas we may identify the following trends:

Dogger Bank

The (southern) part of the Dogger Bank that is lying within the DCS is the smallest subarea and, therefore, has only a limited number of stations (7). In previous years the Dogger Bank has been identied as the area with the highest diversity (based on both Hill (0) and Shannon Wiener index) and the highest mean faunal densities (Holtmann *et al.,* 1999). The biomass per m^2 in this area was about the same as in the Oyster Ground and the offshore area. At the community level the situation was the same in 1999.

In spite of the high diversity of the macrofauna in this subarea, the abundances of individual species were quite variable between 1986 and 1998. A period of peak densities was observed in 1992/1994, followed by a period of low densities between 1995 and

1998. Most of the species that were more or less dominant previously occurred in relatively low densities in the latter years. However, of some species, *viz. Acrocnida brachiata* and the amphipods *Bathyporeia elegans* and *Urothoe poseidonis*, higher densities were found in 1998 than in the preceding years. The increasing trend of particularly the latter 2 species continued in 1999. Further there was a remarkable increase in the abundance of the brittle star *Amphiura chiajei*, from 0 indiv. per m^2 in 1998 to 150 indiv. per m^2 in 1999 on average. The increase of *A. chiajei* and the two amphipod species mentioned is largely responsible for the overall increase in faunal densities in 1999. In contrast, there was an obvious decrease of the gastropod *Natica alderi* in recent years.

Oyster Ground

The relatively deep (30-55 m) Oyster Ground subarea with its fine sandy sediment mixed up with variable amounts of silt and/or clay has a fauna composition that is strongly different from the other subareas. Characteristic species are the brittle star *Amphiura filiformis*, the burrowing shrimp *Callianassa subtruncata*, the amphipod *Harpinia antennaria*, the polychaetes *Chaetopterus variopedatus*, *Nephtys hombergii* and *Pholoe minuta*, and the bivalves *Mysella bidentata* and *Abra alba*.

From 1993 onwards a strong decrease has been observed in the densities of *A. filiformis* (Holtmann, 1999) and in 1999 there was not any sign of recovery of the *Amphiura* population. In the past A. filiformis was one of the most abundant species in the Oyster Ground. Particularly in the Frisian Front area, which separates the Oyster Ground from the southern offshore area, high densities (up to ≈2000 indiv. per m^2) were found. The species is known to be an obligatory inhabitant of muddy sediments (O'Connor, 1983, Duineveld & van Noort, 1986, Künitzer *et al.*, 1992). It has been suggested, therefore, that a decrease in mud contents of the sediment could have played a role in the decrease of A. filiformis. However, as we discussed above, it is doubtful whether there actually has been a decrease of mud contents in the nineties. Moreover, a strong decrease has been observed particularly in the Frisian Front. At the central Frisian Front station OYS 36 (formerly called META 2) the densities have decreased from 1500 to 2000 indiv. per m^2 in the eighties and early nineties to less than 100 indiv. per m^2 at present. The highest densities are no longer found at the Frisian stations but further north. However, as Fig. 3 shows, the highest mud contents can still be found at the Frisian Front stations. If a decrease in mud contents would have been a substantial factor, the effect should have been expected primarily at stations where the mud contents are already relatively low by nature. Moreover, it has been shown earlier that year to year variations in the abundance of A. filiformis did not show any relationship with simultaneous variations in mud contents (Holtmann et al., 1996). It has been shown that juvenile specimens can be found

each year which confirms that reproduction and settlement of new generations takes place (Brocken, 1998). Apparently the percentage survival of these new generations is too low to compensate the (increased ?) mortality among the adult population.

Offshore

The most consistent trend in the offshore area is a decrease in the abundance of molluscs from 1994 onwards. Still the numbers found in 1999 are not yet at a dramatic low level. These numbers are comparable to those found in the second half of the eighties. However, it is remarkable that most of the molluscs found were of a small size. Of those bivalve species which potentially can reach a large size (for *example Dosinia spp., Chamaelea gallina*) only juvenile specimens were found. This might indicate that, although there is recruitment and settlement of new generations, there is a low survival rate and hardly any chance to build op new adult populations. The question is why the survival rate is that low. Bivalves are generally filter feeders or surface deposit feeders which theoretically could take profit the primary production in the water column. For that reason one should expect vital bivalve populations in the highly productive southern North Sea. A possible explanation might be that bivalves are particularly sensitive to beamtrawl fisheries. There is, however, no reason to expect that beamtrawl fisheries have strongly increased in the southern North Sea after 1994.

Not only bivalves have decreased in the nineties. The gastropod *Natica alderi* also showed a decrease after 1994. Since this species is carnivorous and feeds on bivalves it seems conceivable that the decrease of bivalves has caused the decrease of *N. alderi.*

Coastal area

The major trends in the coastal area are more or less the same as in the offshore area. In the coastal area molluscs occur in much higher abundance and have a much larger mean biomass (≈25 g AFDW per m2) than in the offshore area (≈1 g AFDW per m^2), due to the presence of banks of *Spisula sutruncata* and/or *Ensis* spp.. However, in the coastal area there was also a slight overall decrease of molluscs during the nineties and, just like in the offshore area the decrease was not only in bivalves, but also in the carnivorous *Natica alderi.*

7. Acknowledgements

The monitoring programme is initiated by the National Institute for Coastal and Marine Management, with P.V.M. Bot as project leader (RIKZ, den Haag), and is carried out in cooperation with the North Sea Nirectorate (DNZ) and the department of Marine Ecology of the NIOZ. We want to thank the captain and crew on board of the RV Mitra, RV Arca and RV Delta for their assistance during the fieldwork, W. Schreurs and G. den Hartog (RIKZ Middelburg) for the analysis of the sediment samples, G.M. Janssen for critical reading the original manuscript, M. van Arkel for his contribution in the organisation and H. Hobbelink for the cover design.

8. References

ANONYMOUS, 1999. Meetverslag ms. Mitra, Arca week 09, 10, 12, 14, 17, 1999. EXP*BMN/ BENTHOS. -*Rijkswaterstaat, Directie Noordzee: 68 pp.*

BROCKEN, F., 1998. A population study of *Amphiura filiformis* (Echinodermata: Ophiuroidea) at the Frisian Front, North Sea. -*Graduating Report, University of Groningen, February 1998: 29pp.*

DAAN, R., M.J.N. BERGMAN & G.C.A. DUINEVELD, 2000. Macrobenthos op Loswal Noord en Noordwest in 1999, 3 jaar na verplaatsing van het stortingsgebied. -*NIOZ-report 2000-2, NIOZ, Texel, The Netherlands: 51 pp*

DEKKER, R. & W. DE BRUIN, 1998.Het macrobenthos op 12 raaien in de Waddenzee en de Eems Dollard in 1997. –*NIOZ-rapport 1998-3: 53 pp.*

DUINEVELD, G.C.A. & G.J. VAN NOORT, 1986. Observations on the population dynamics of *Amphiura filiformis* (Ophiuroidea: Echinodermata) in the southern North Sea and its exploitation by dab, *Limanda limanda*. –*Neth. J. Sea Res. 20(1): 85-94.*

DUINEVELD, G.C.A. & J.J.M. BELGERS, 1993. The macrobenthic fauna in the Dutch sector of the North Sea in 1992. -*NIOZ-report 1993-11, NIOZ, Texel, The Netherlands: 59pp.*

DUINEVELD, G.C.A. & J.J.M. BELGERS, 1994. The macrobenthic fauna in the Dutch sector of the North Sea in 1993 and a comparison with previous data. -*NIOZ-report 1994-12, NIOZ, Texel, The Netherlands: 103pp.*

DUINEVELD, G.C.A., H.J. WITTE, 1987. Report on an intercalibration exercise on methods for determining ashfree dry weight of macrozoobenthos.- *ICES CM 1987/L:39: 6pp.*

ESSINK, K., 1991. Bemonstering en analyse van macroscopische bodemfauna van de Voordelta en de Noordzee (Nederlands Continentaal Plat).-*Getijdewateren Standaard Voorschrift, Rijkswaterstaat Dienst Getijdewateren: 9pp.*

ESSINK, K., 1995. Change of strategy for monitoring macrozoobenthos in the Dutch sector of the North Sea. -*National Institute for Coastal and Marine Management/RIKZ/ Working-document OS-95.606x: 5pp.*

GULLENTOPS, F., M. MOENS, A. RINGELE & R, SENGIER, 1977. Geologische kenmerken van de suspensies en de sedimenten. -*In: J. Nihoul & F. Gullentops (eds): Mathematisch Model Noordzee. Vol 4. Sedimentologie.*

HARPER, J.L. & D.L. HAWKSWORTH, 1994. Biodiversity: measurement and estimation. *Phil. Trans. R. Soc., Ser. B, 345: 5-12.*

HILL, M.O., 1973. Diversity and evenness: A unifying notation and its consequences. *Ecology 54(2): 427-432.*

HOLTMANN, S.E. & A. GROENEWOLD, 1992. Distribution of the zoobenthos on the Dutch Continental Shelf: the Oyster Ground, Frisian Front, Vlieland Ground and Terschelling Bank (1991). *-NIOZ-report 1992-8, NIOZ, Texel, The Netherlands, NIOO-CEMO rapporten en verslagen 1992-6: 129pp.*

HOLTMANN, S.E. & A. GROENEWOLD, 1994. Distribution of the zoobenthos on the Dutch Continental Shelf: The western Frisian Front, Brown Bank and Broad Fourteens (1992/1993). *-NIOZ-report 1994-1, NIOZ, Texel, The Netherlands, NIOO-CEMO rapporten en verslagen 1994-1: 136pp.*

HOLTMANN, S.E., J.J.M. BELGERS, B. KRACHT & R. DAAN, 1996. The macrobenthic fauna in the Dutch sector of the North Sea in 1995 and a comparison with previous data. *-NIOZ-report 1996-8, NIOZ, Texel, The Netherlands: 102 pp.*

HOLTMANN, S.E., G.C.A. DUINEVELD & M. MULDER, 1999. The macrobenthic fauna in the Dutch sector of the North Sea in 1998 and a comparison with previous data. *-NIOZ-report 1999-5, NIOZ, Texel, The Netherlands: 105 pp.*

KÜNITZER, A., D. BASFORD, J.A. CRAEYMEERSCH, J.M. DEWARUMEZ, J. DÖRJES, G.C.A. DUINEVELD, A. ELEFTHERIOU, C. HEIP, P. HERMAN, P. KINGSTON, U. NIERMANN, E. RACHOR, H. RUMOHR AND P.A.W.J. DE WILDE, 1992. The benthic infauna of the North Sea: species distribution and assemblages. –ICES J. Mar. Sci. 49: 127-143.

O'CONNOR, B., T. BOWMER & A. GREHAN, 1983. Long-term assessment of the population dynamics of *Amphiura filiformis* (Echinodermata: Ophiuridae) in Galway Bay (west coast of Ireland). *–Mar. Biol. 75: 279-286.*

PEARSON, T.H. & R. ROSENBERG, 1978. Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. *-Oceanogr. Mar. Biol. Ann. Rev. 16: 229-311.*

PETERSON, C.H., 1977. Species diversity and perturbations: predictions of a non-interactive model. *-Oikos 29: 239-244.*

RICCIARDI, A. & E. BOURGET, 1998. Weight-to-weight conversion factors for marine benthic macroinvertebrates. *-Mar. Ecol. Prog. Ser. 163: 245-251.*

RUMOHR, H., T. BREY & S. ANKAR, 1987. A compilation of biometric conversion factors for benthic invertebrates in the Baltic Sea. *-Baltic Marine Biology Publ. 9: 1-56.*

SHANNON, C.E. & W. WEAVER, 1949. The mathematical theory of communication. *-Univ. of Illinois Press, Urbana.*

SIMPSON, E.H., 1949. Measurements of diversity. *-Nature, 163: 688-688.*

YLAND, E., 1995. Biologisch monitoringprogramma zoute wateren, stand van zaken 1995. *-Werkdocument RIKZ IT-95.170X: 39pp.*

ZONNEVELD, P.C., 1994. Vergelijkend onderzoek korrelgroottebepaling (zeef/malvern). *-Rijks Geologische Dienst, Rapp. No. OP 6500.*

Tables and Figures

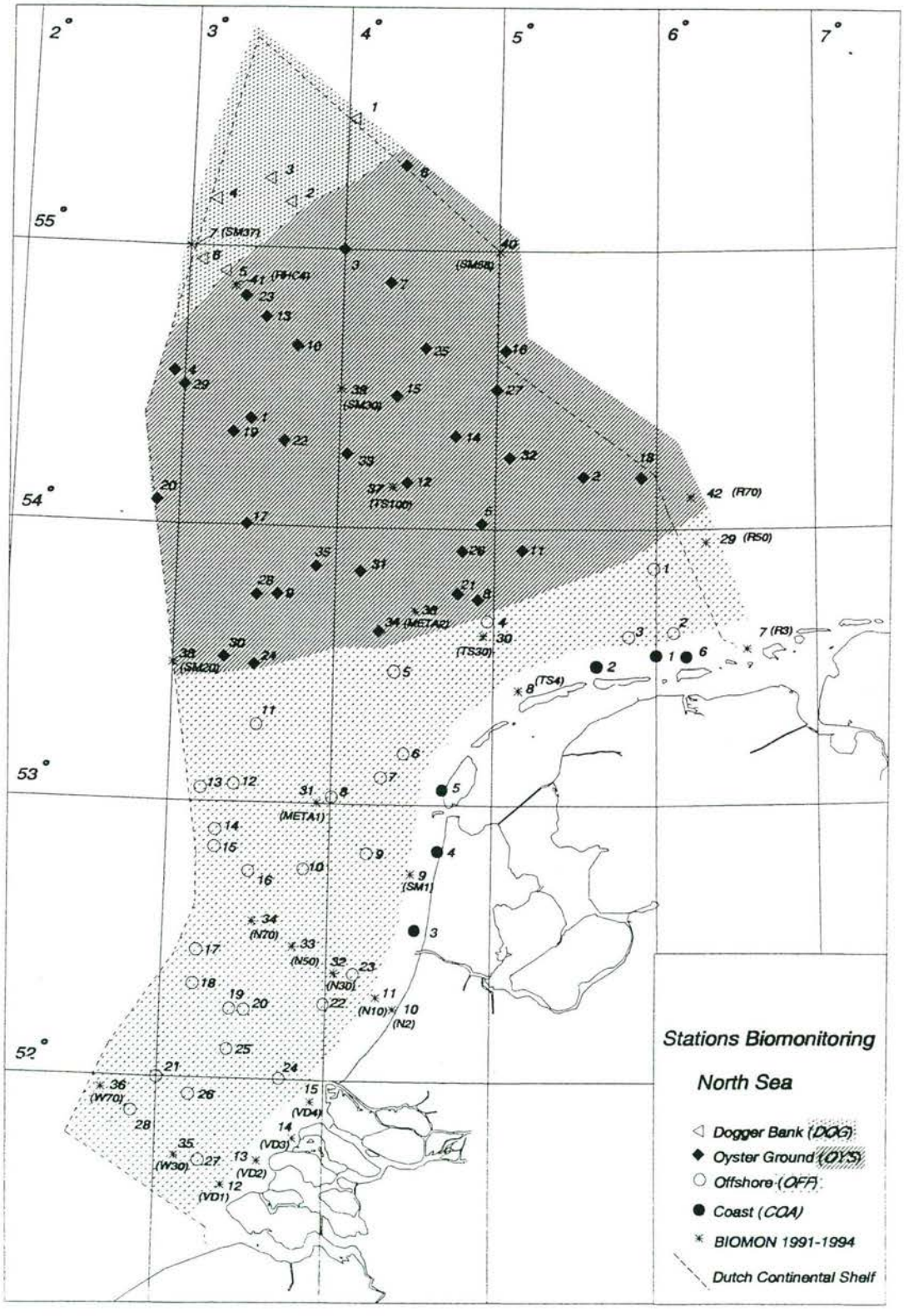


Fig. 1. Locations of the sampling stations

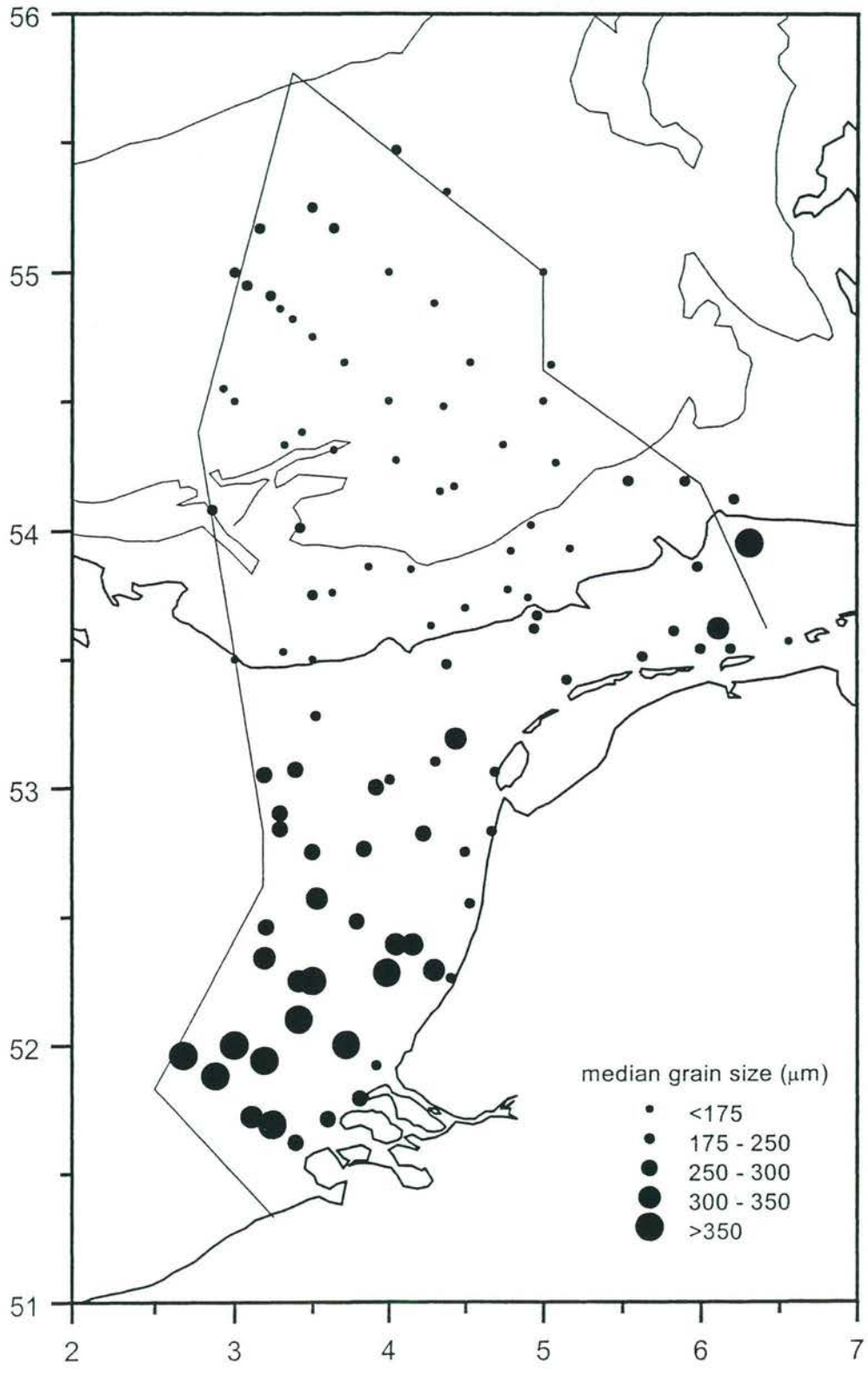


Fig. 2: Median grain size (µm) of the sediment in 1999

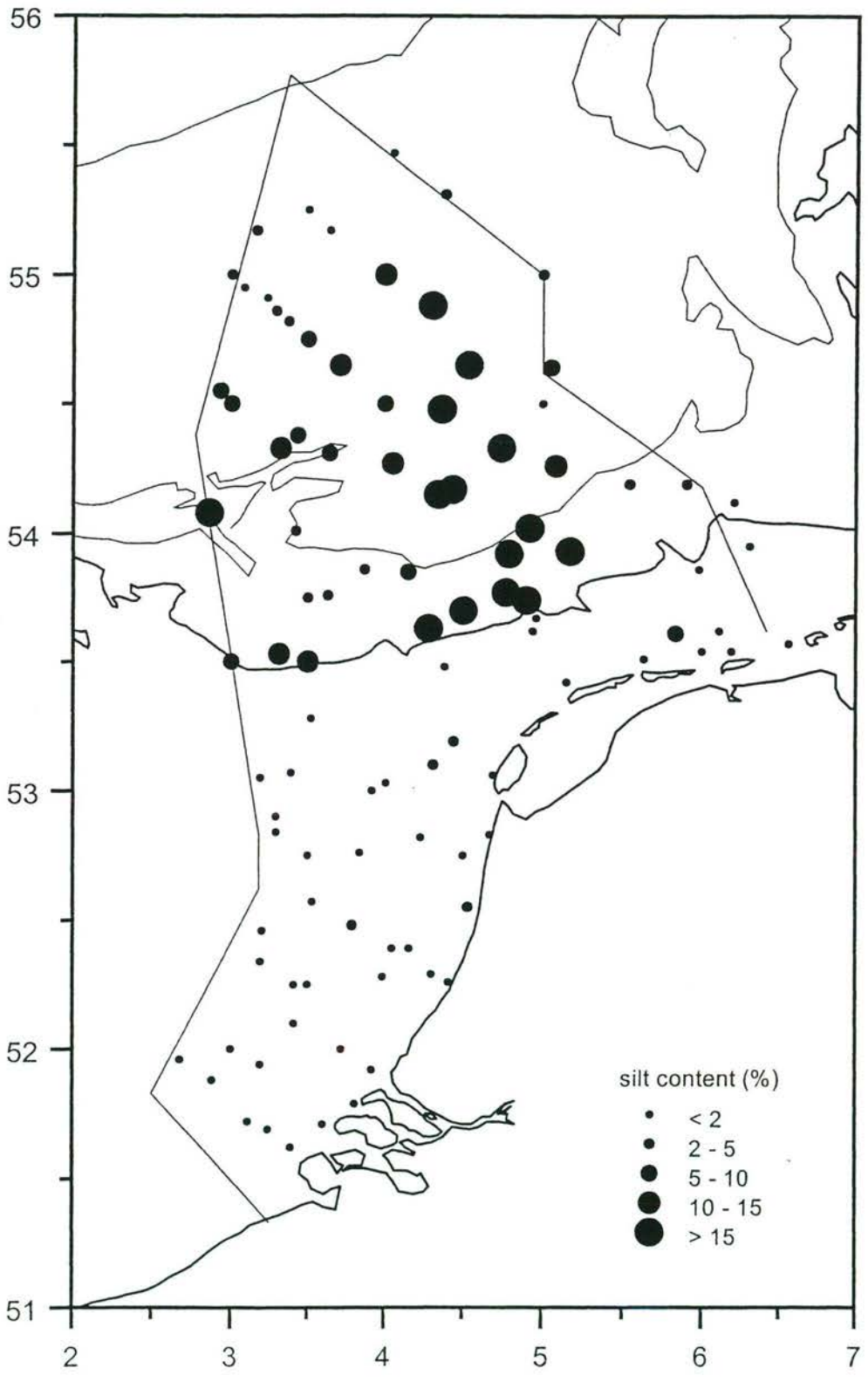


Fig. 3: Silt content (fraction <63 μm) of the sediment in 1999.

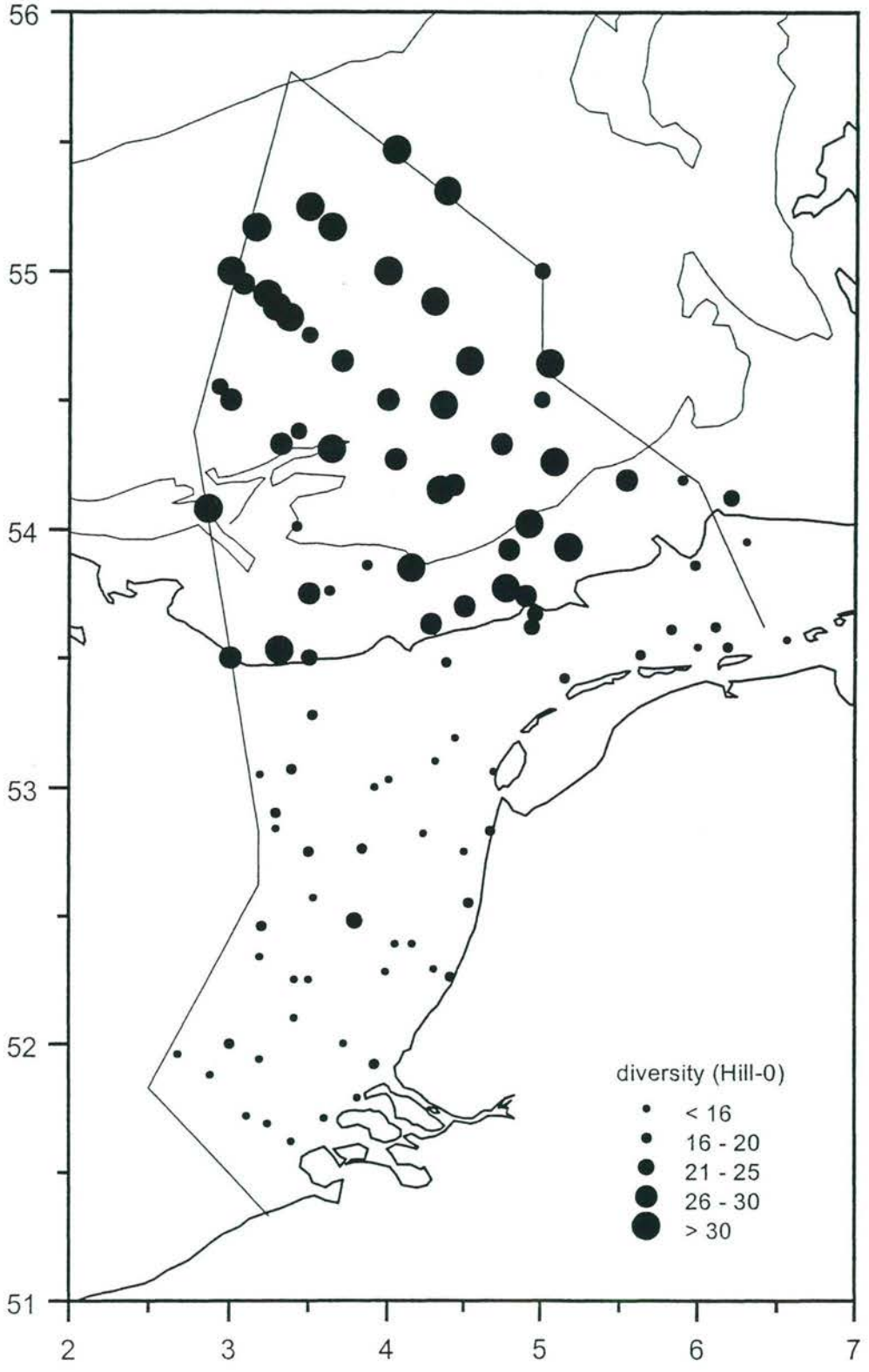


Fig. 4: The number of species per sample (Hill-0) in 1999.

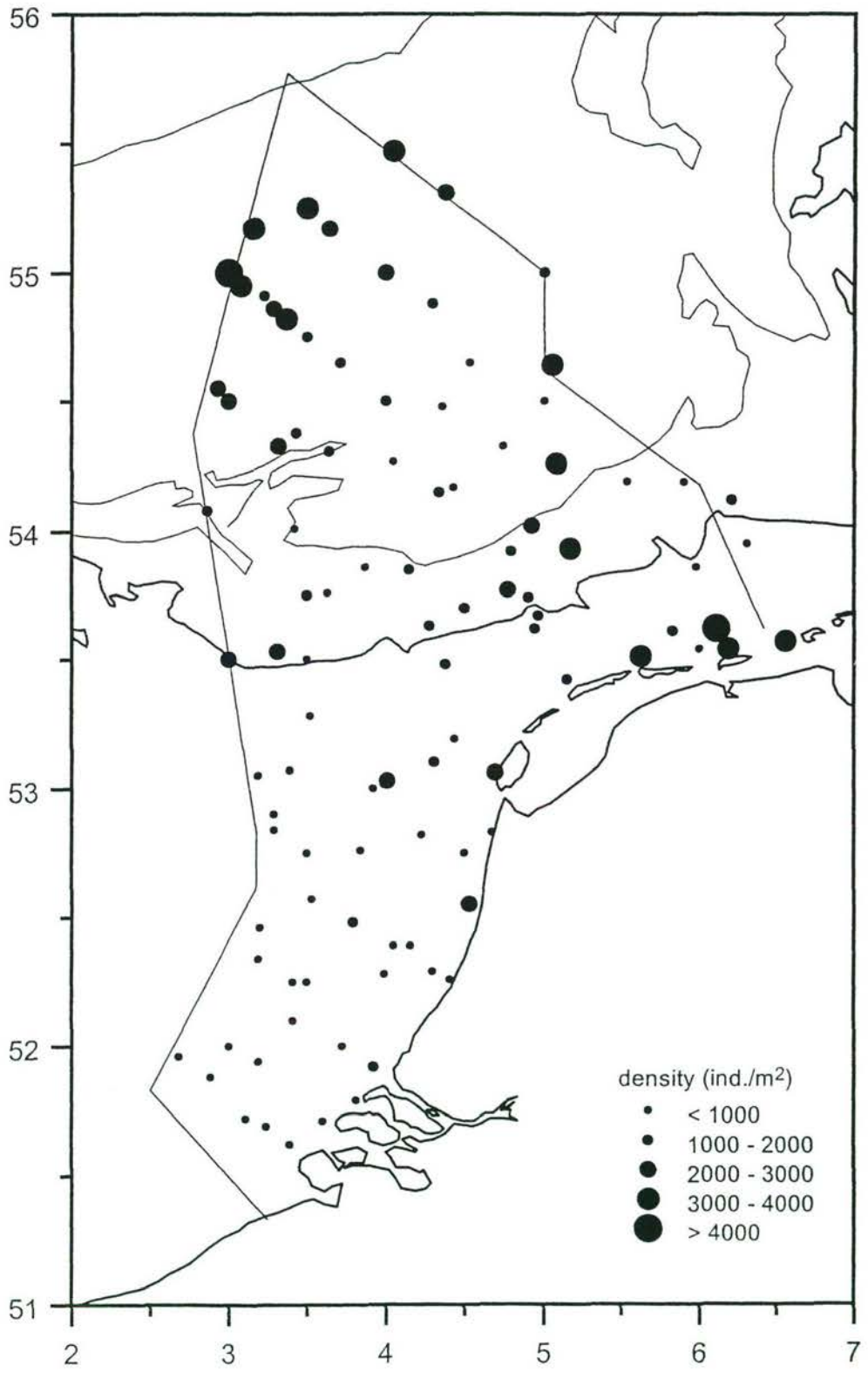


Fig. 5: The total fauna density in 1999.

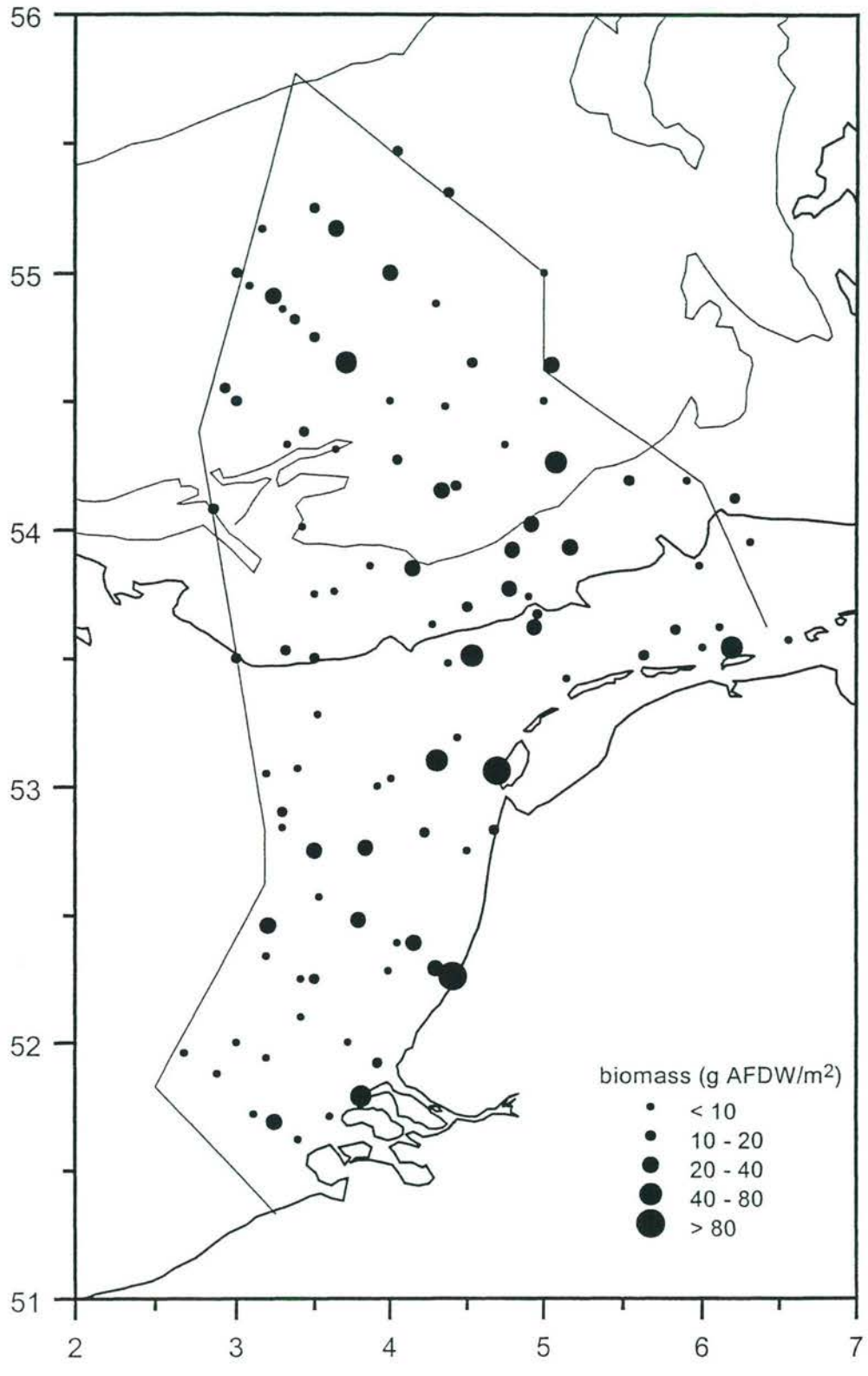


Fig. 6: The total biomass (g AFDW/m2) of the macrobenthos in 1999.

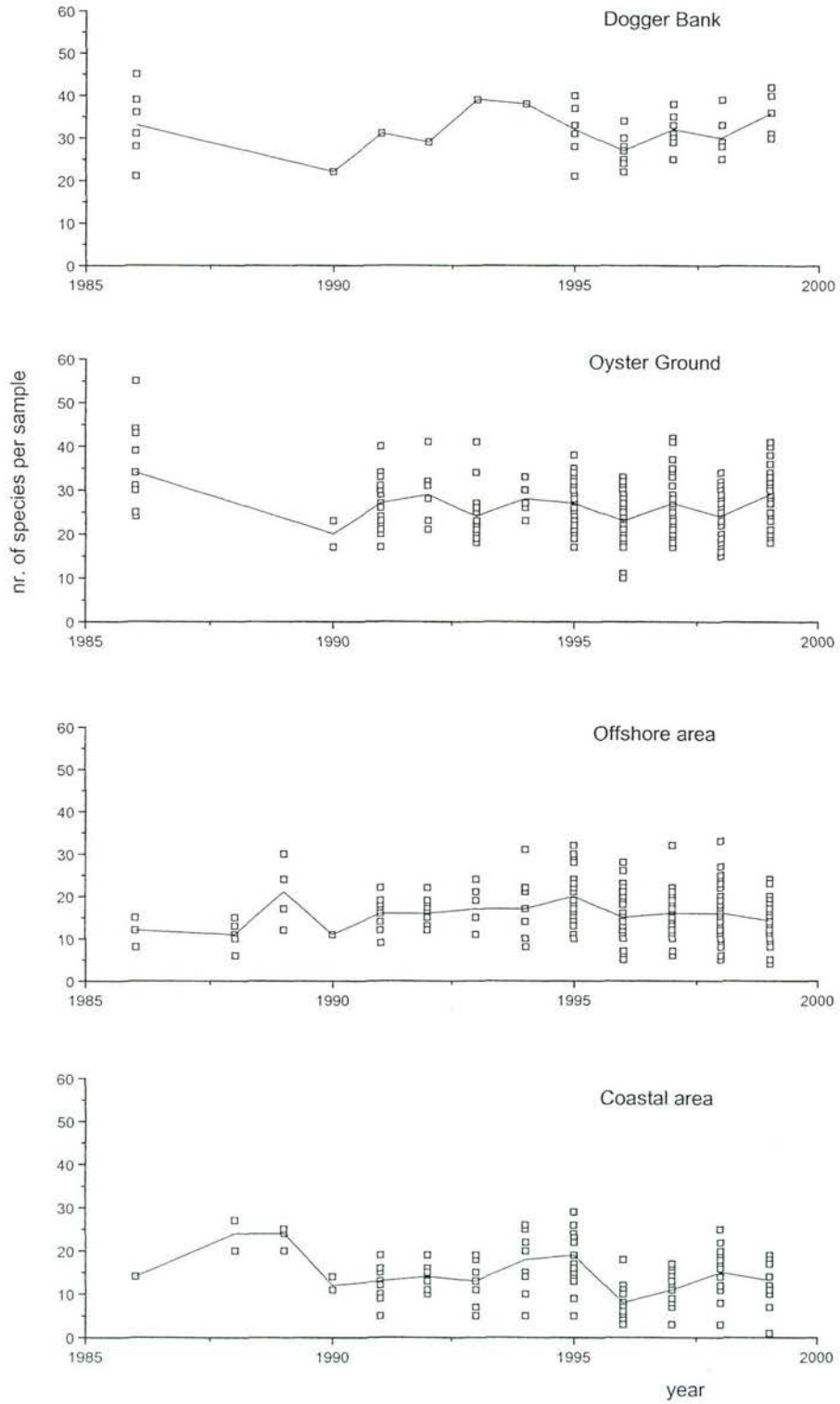


Fig. 7: Temporal patterns in species richness (Hill-0) between 1986 and 1999

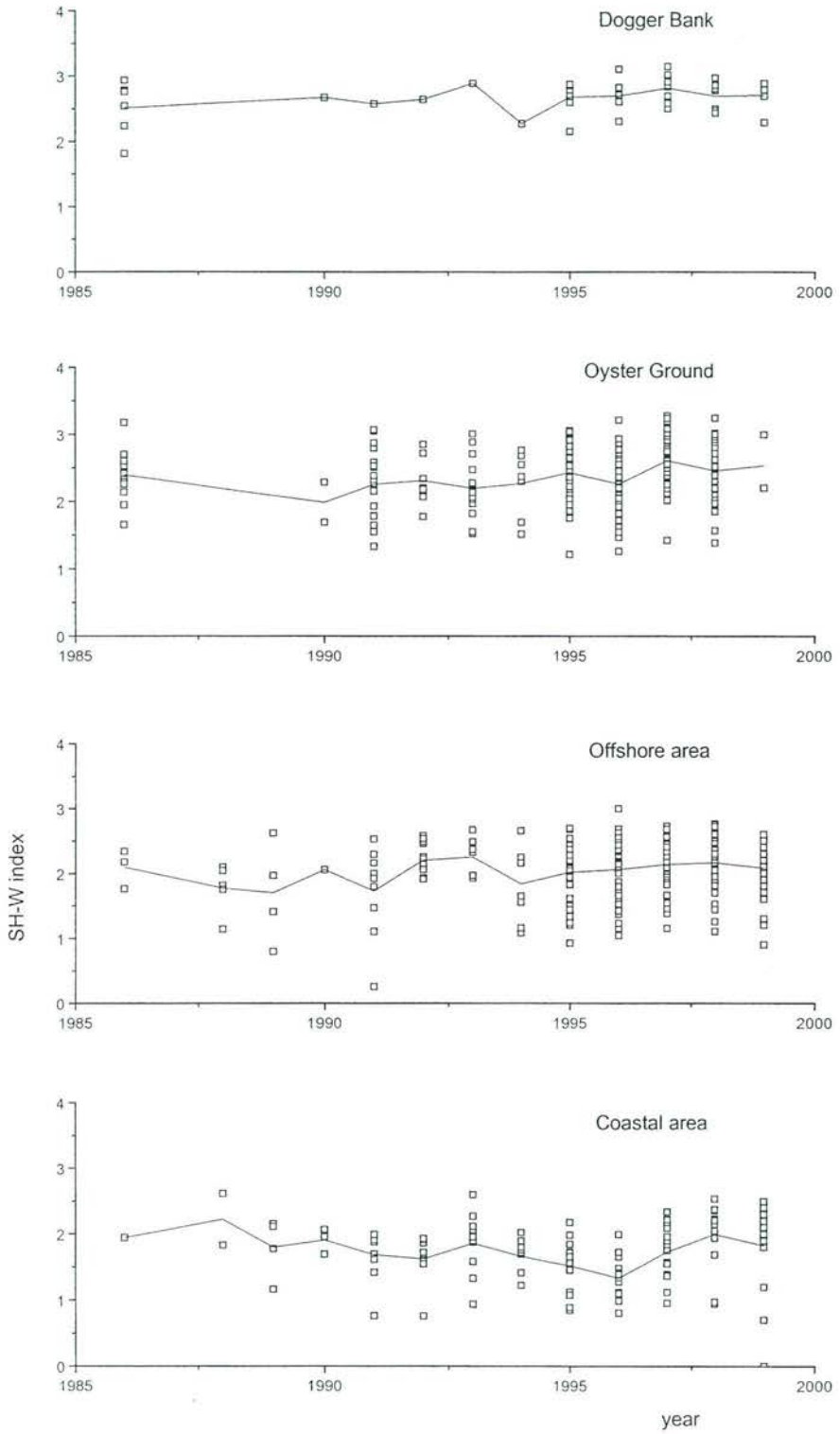


Fig. 8: Temporal patterns in Shannon-Wiener diversity between 1986 and 1999

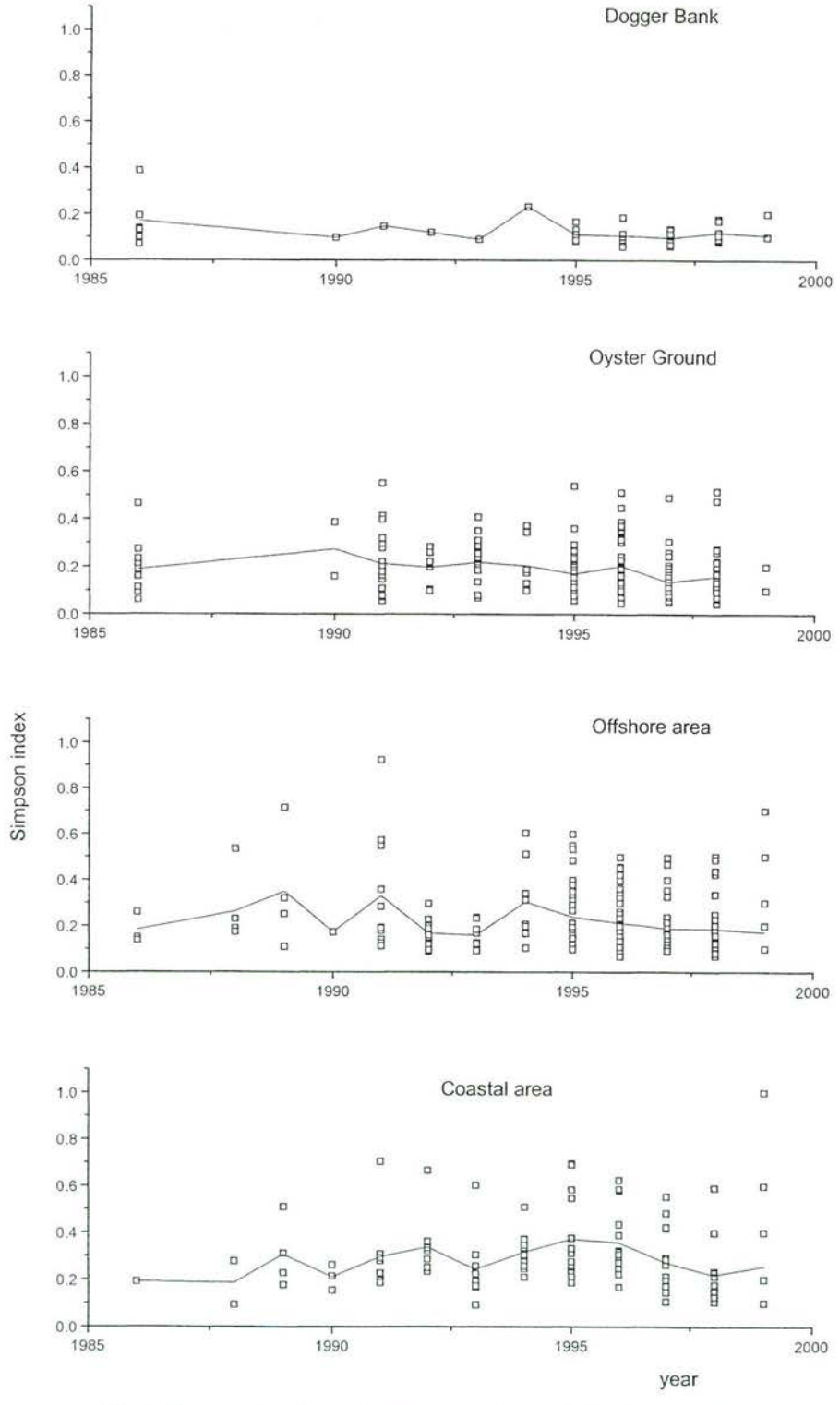


Fig. 9: Temporal patterns Simpson's dominance between 1986 and 1999

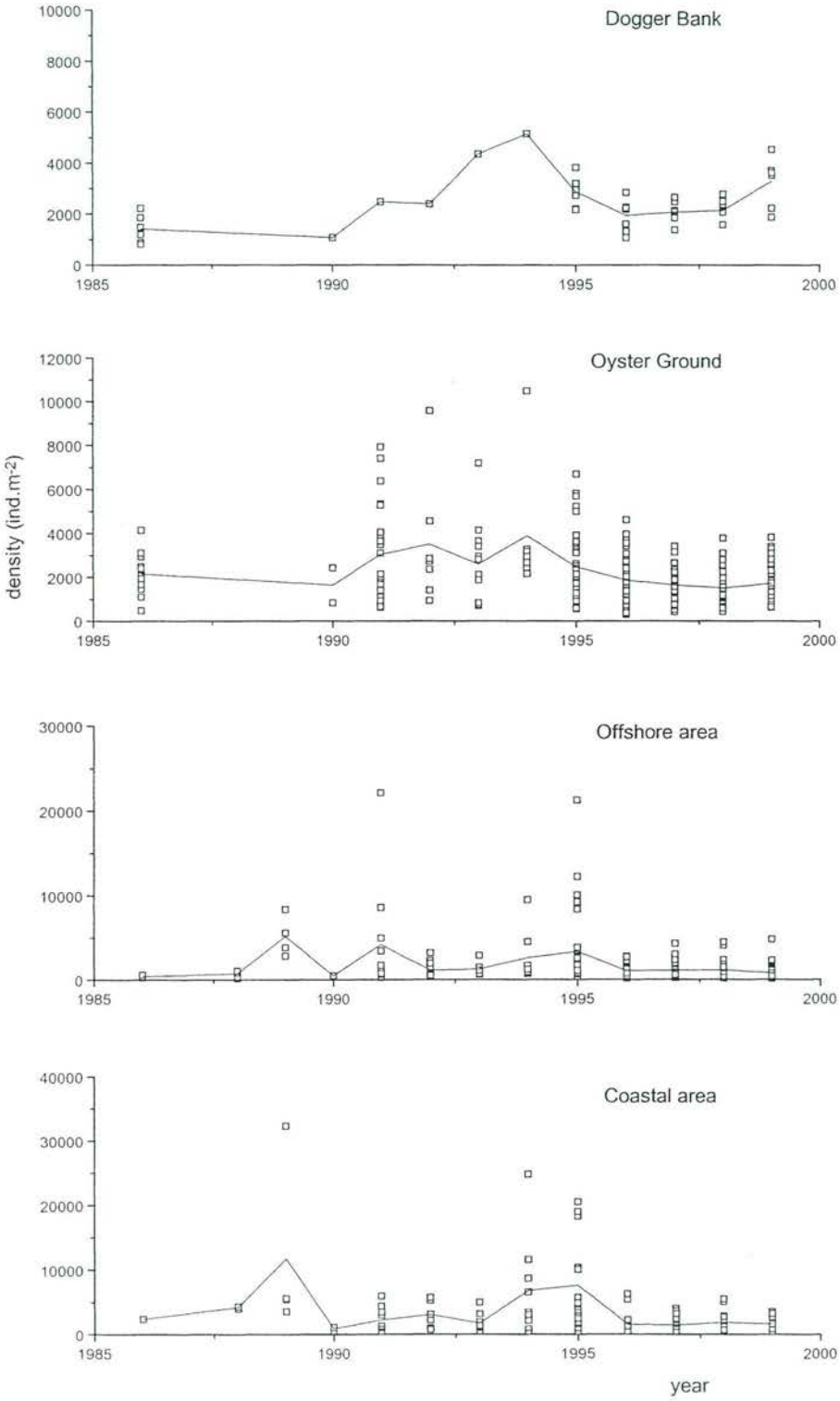


Fig. 10: Temporal patterns in macrobenthos density between 1986 and 1999

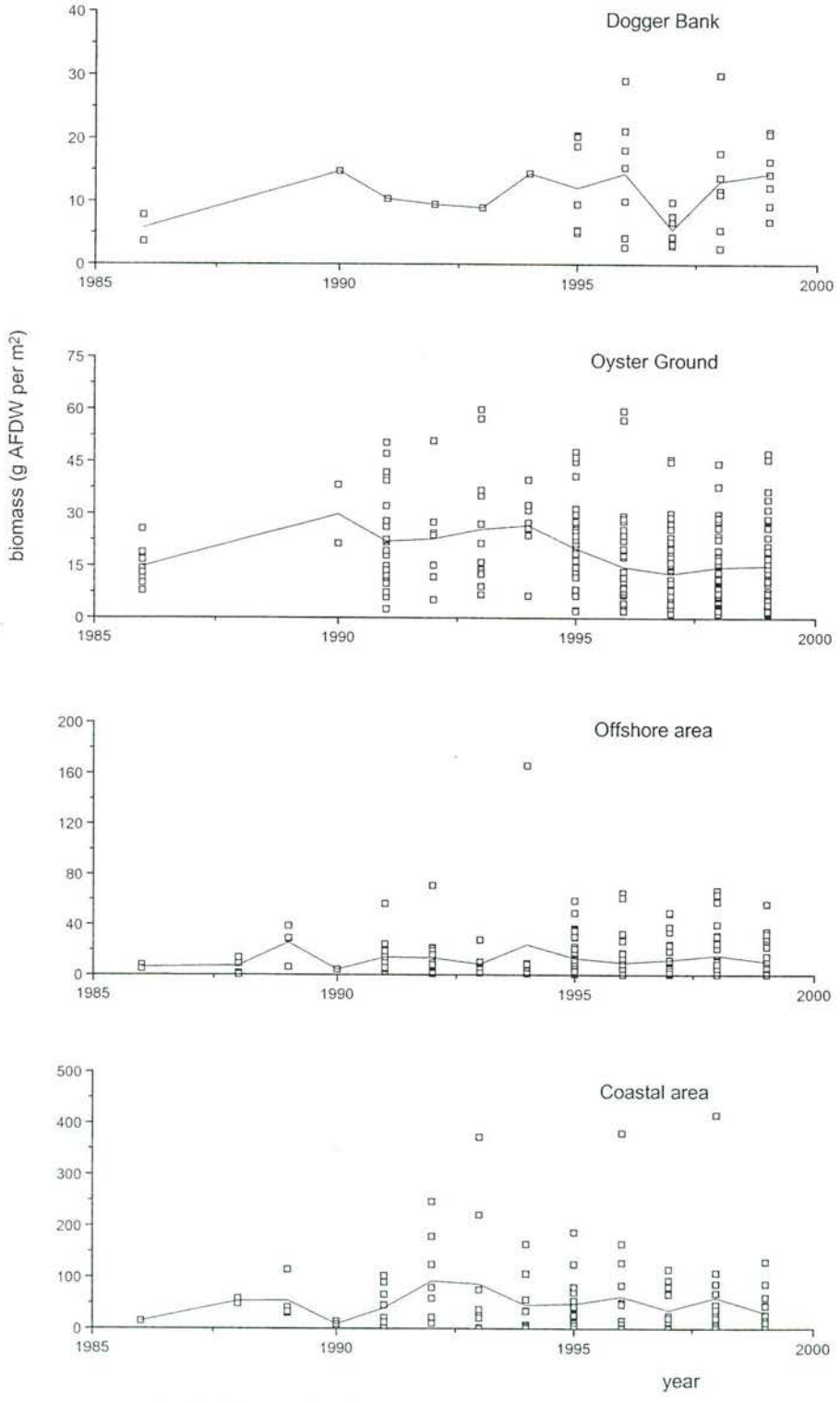


Fig. 11: Temporal patterns in biomass between 1986 and 1999

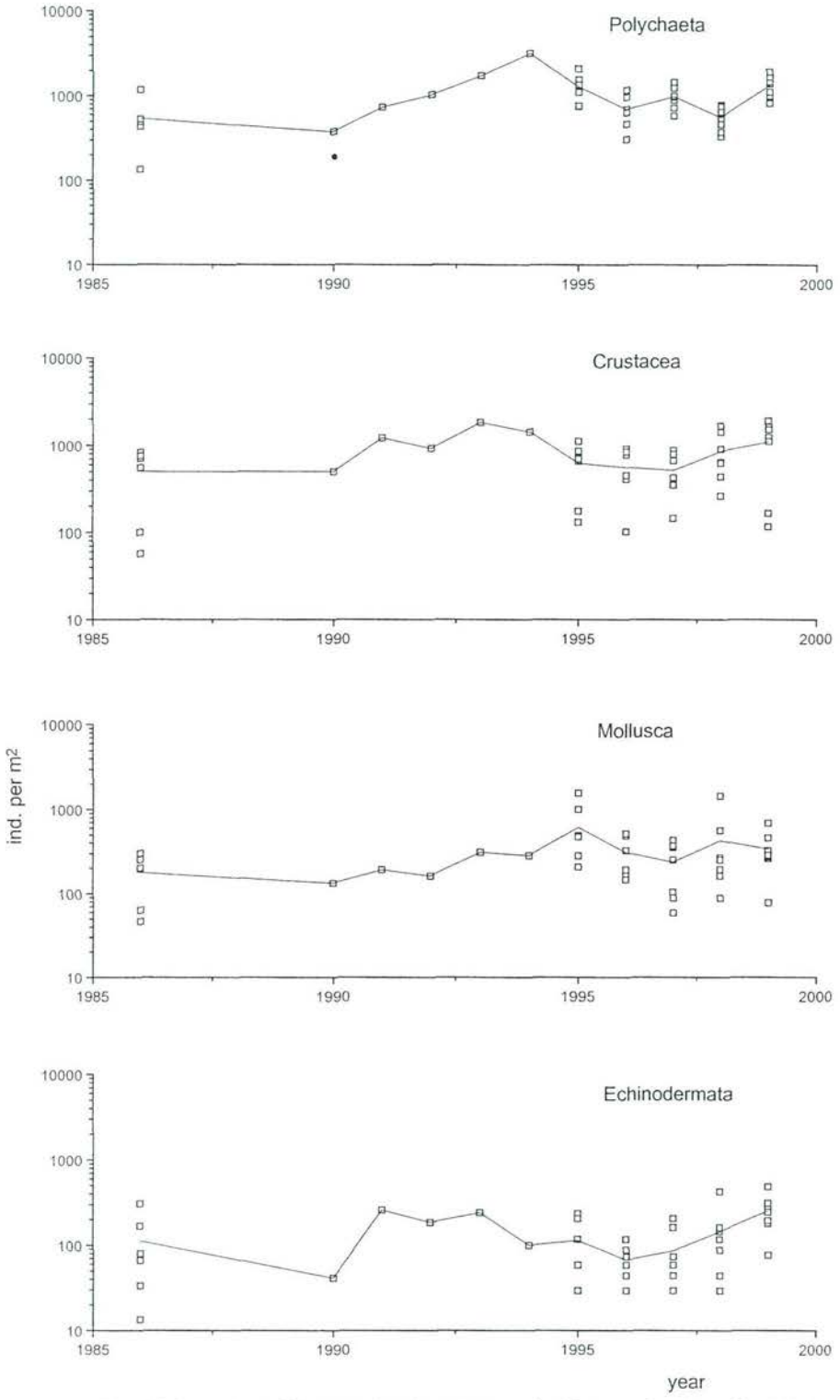


Fig. 12: Densities of 4 macrobenthos taxa at the Dogger Bank (1986-1999).

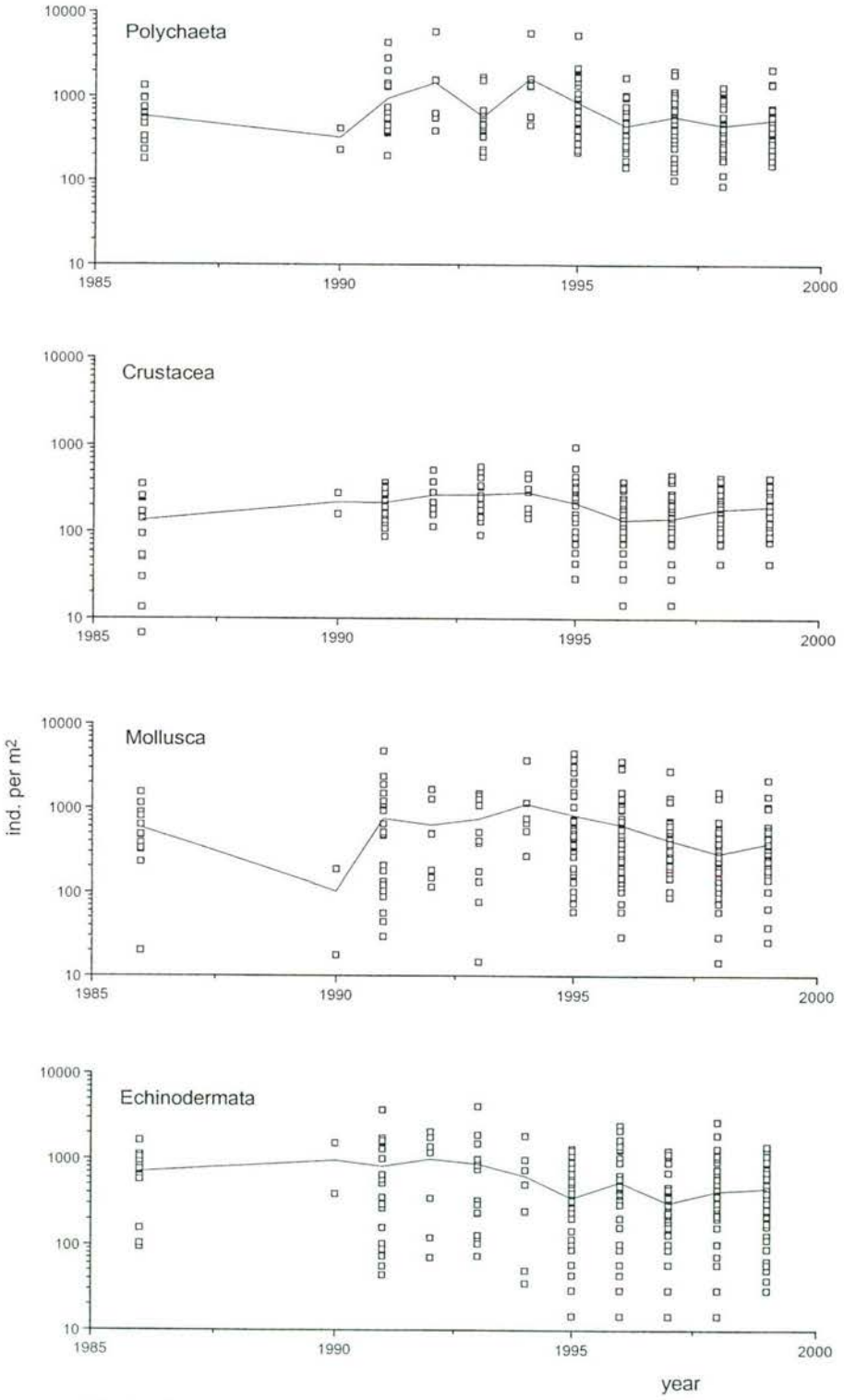


Fig. 13: Densities of 4 macrobenthos taxa in the Oyster Ground (1986-1999)

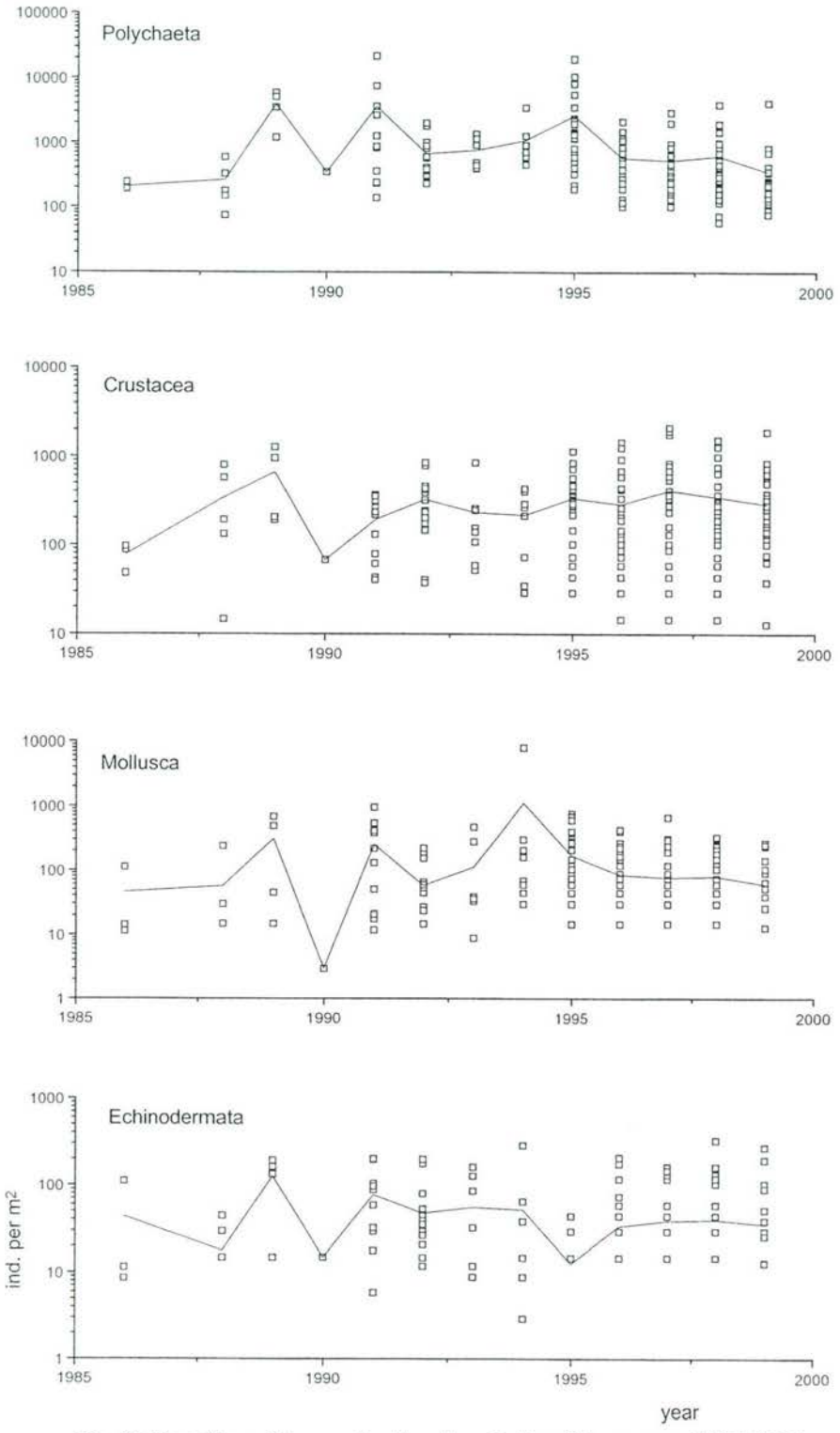


Fig. 14: Densities of 4 macrobenthos taxa in the offshore area (1986-1999)

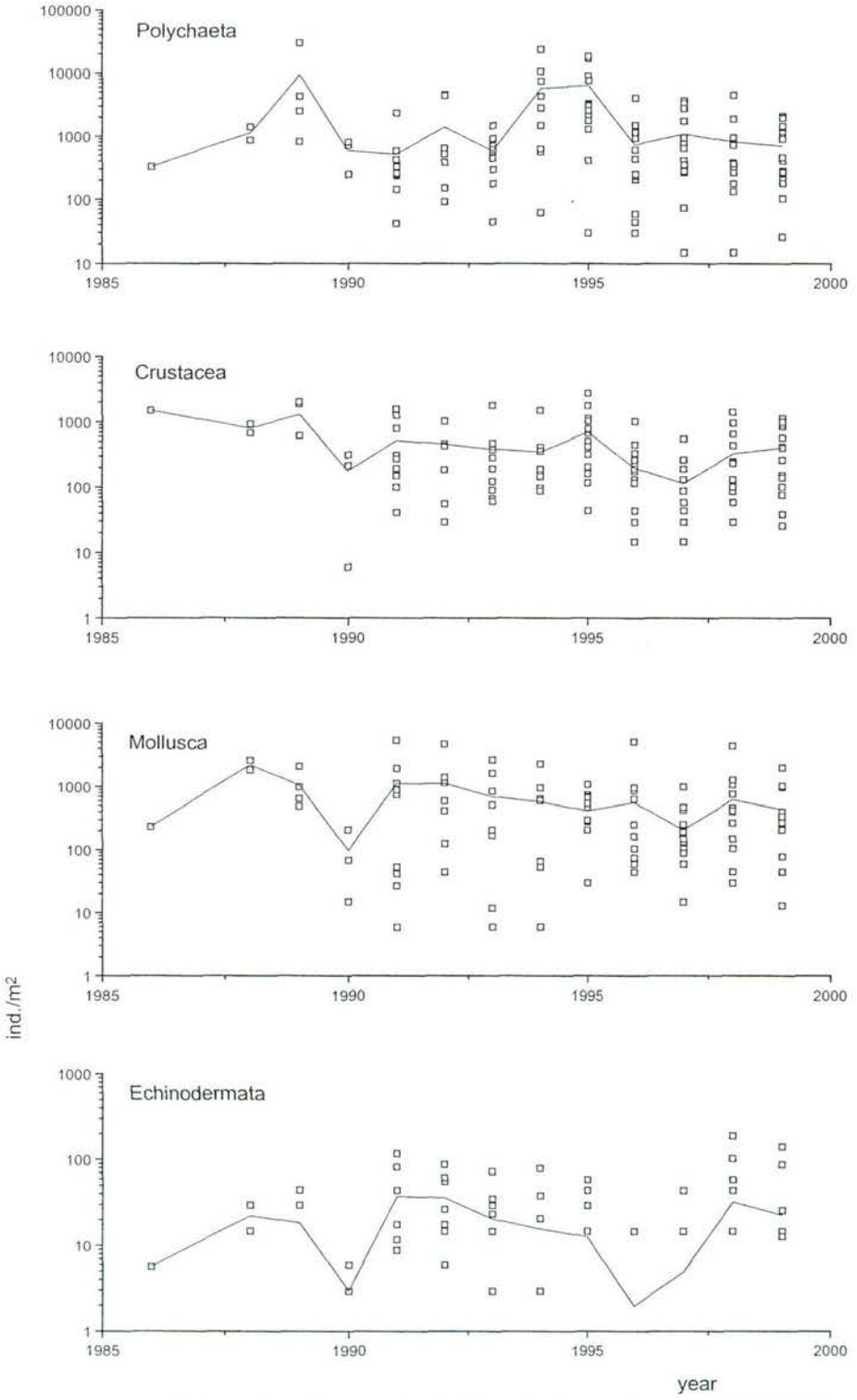


Fig. 15: Densities of 4 macrobenthic taxa in the coastal area (1986-1999)

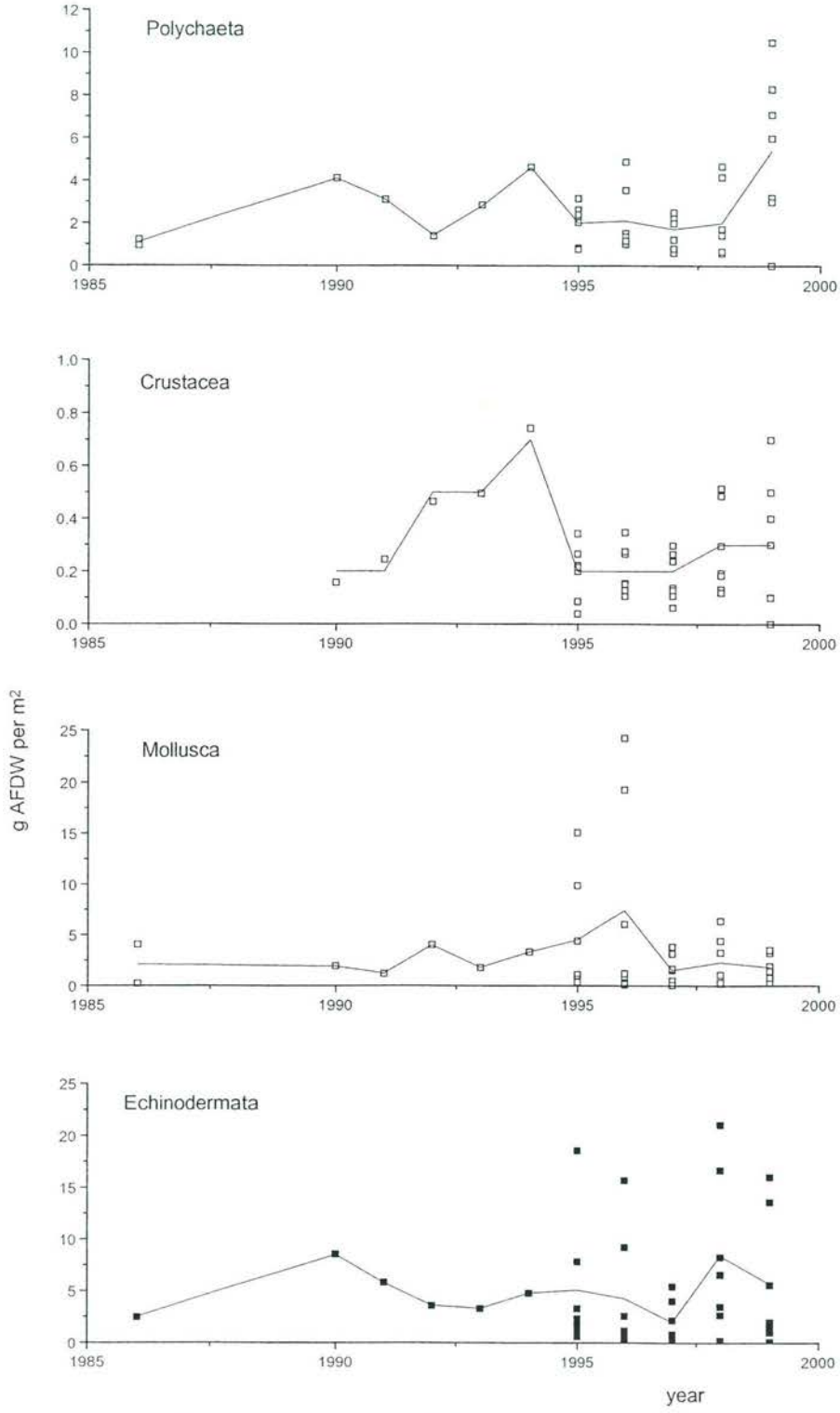


Fig. 16: Biomass of 4 macrobenthos taxa on the Dogger Bank (1986-1999)

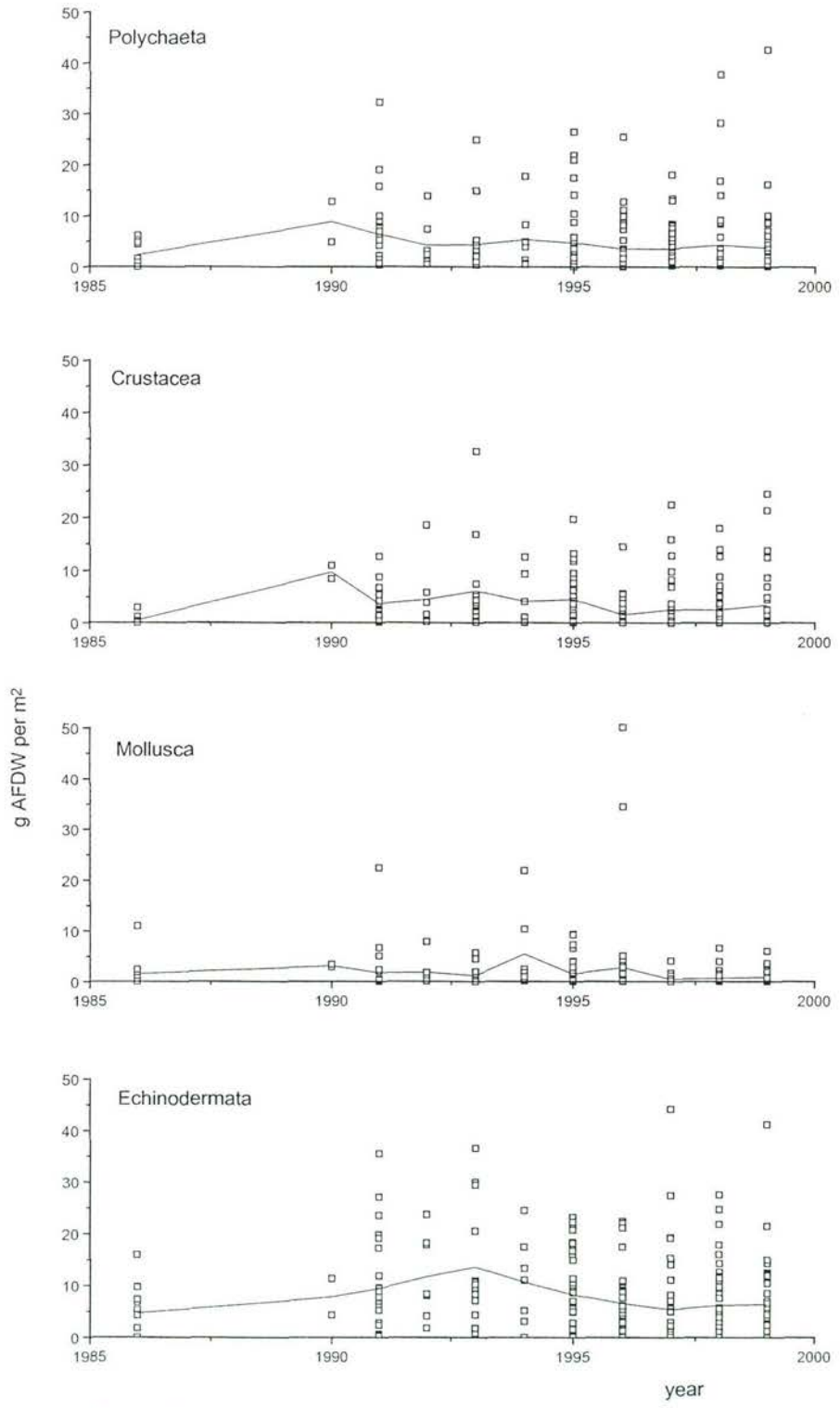


Fig. 17: Biomass of 4 macrobenthos taxa in the Oyster Ground (1986-1999)

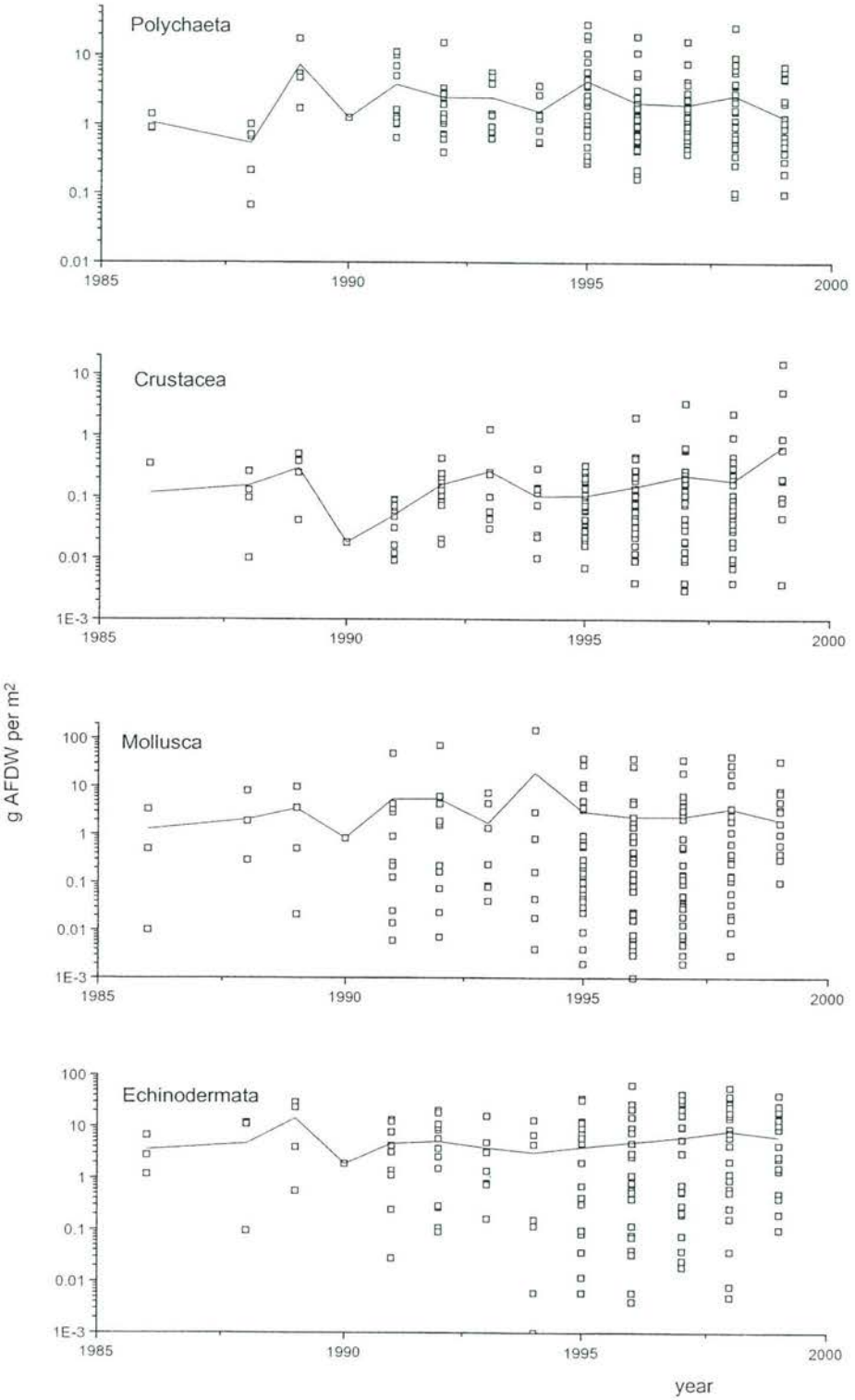


Fig. 18: Biomass of 4 macrobenthic taxa in the offshore area (1986-1999)

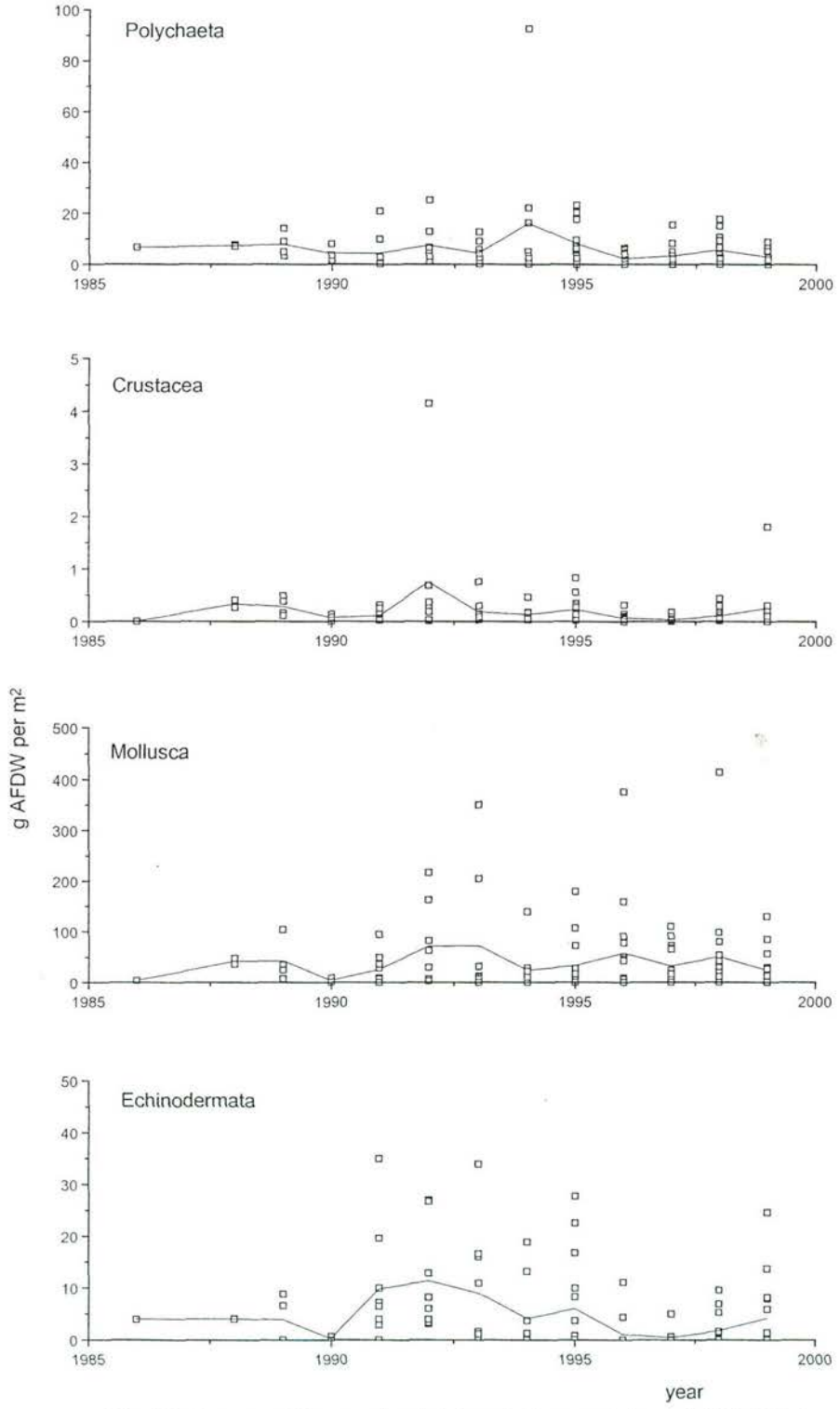


Fig. 19: Biomass of 4 macrobenthic taxa in the coastal area (1986-1999)

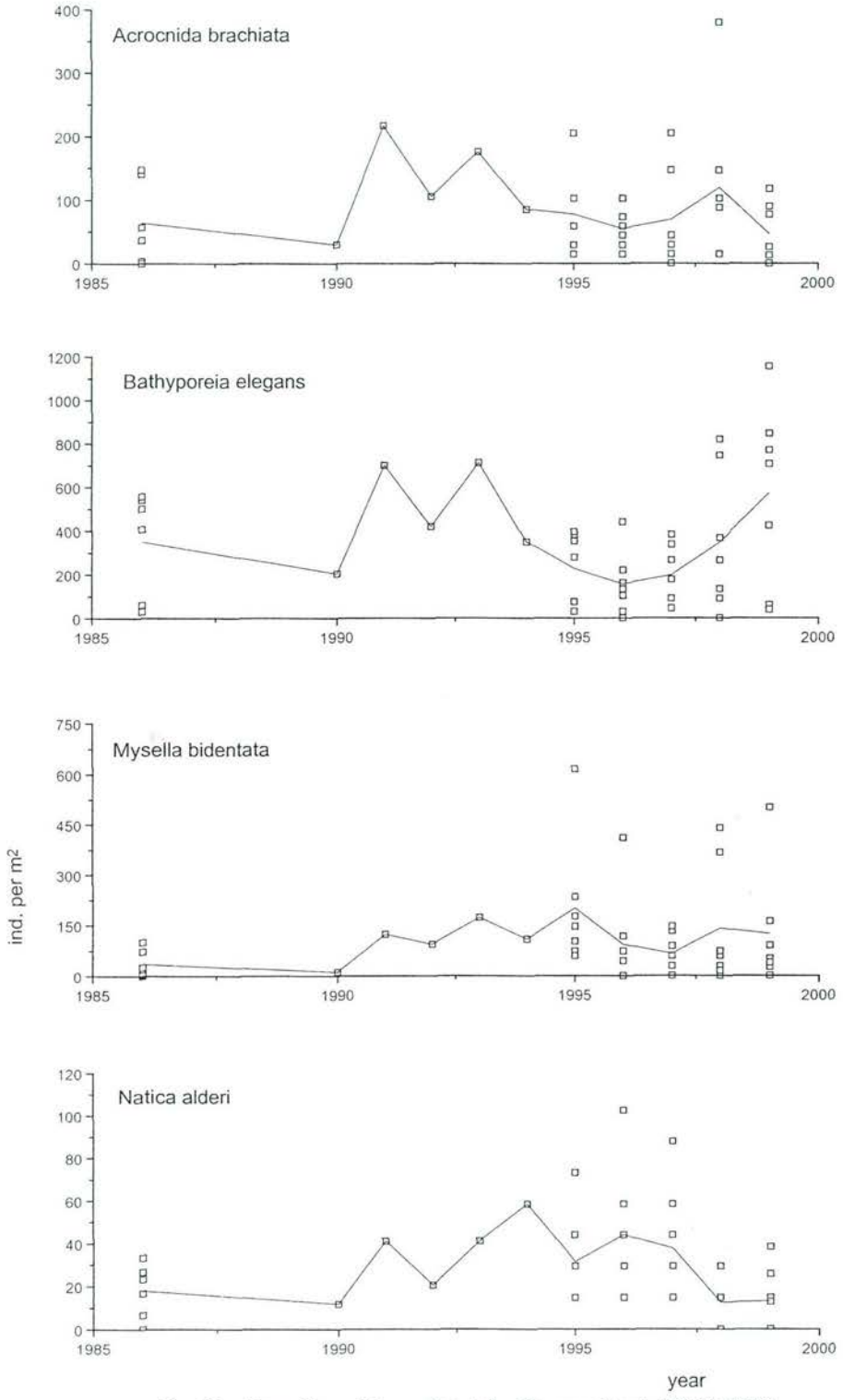


Fig. 20a: Densities of 4 species at the Dogger Bank (1986-1999)

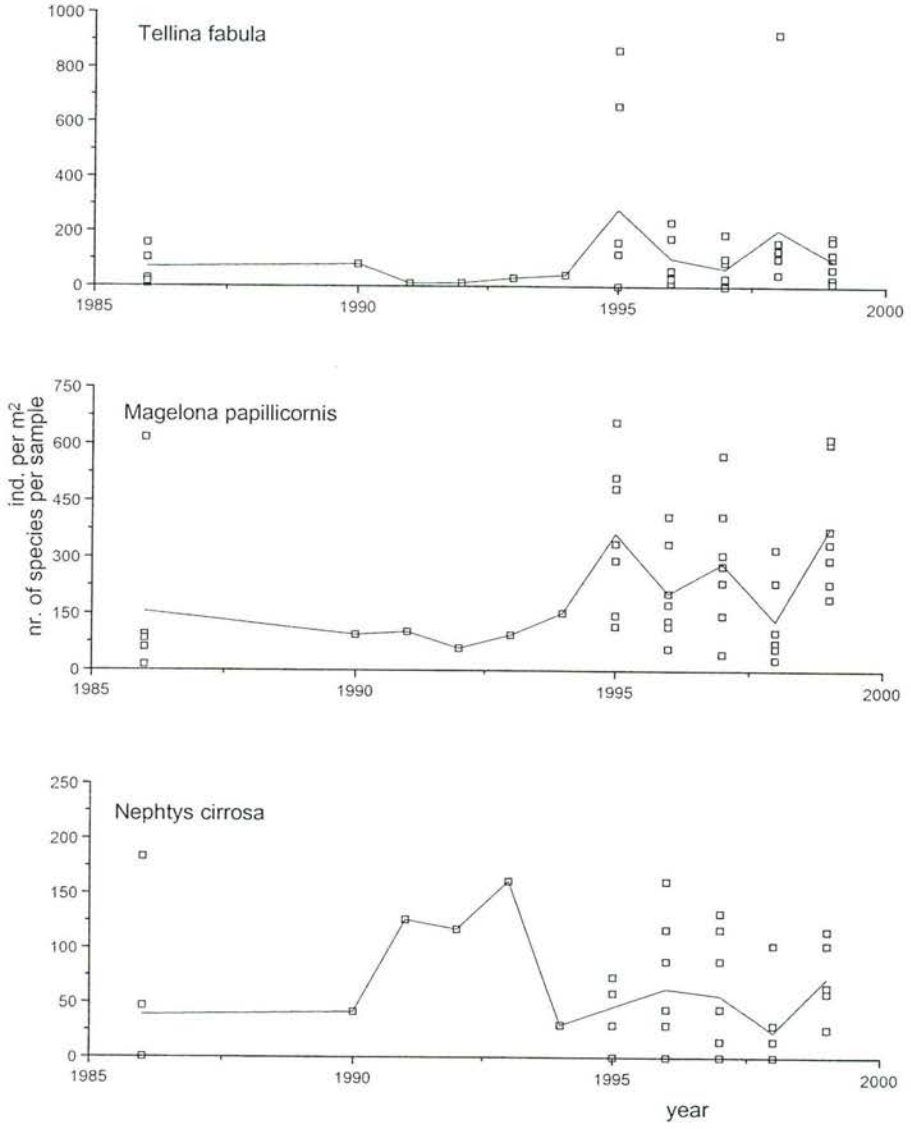


Fig. 20b: Densities of 3 species at the Dogger Bank (1986-1999)

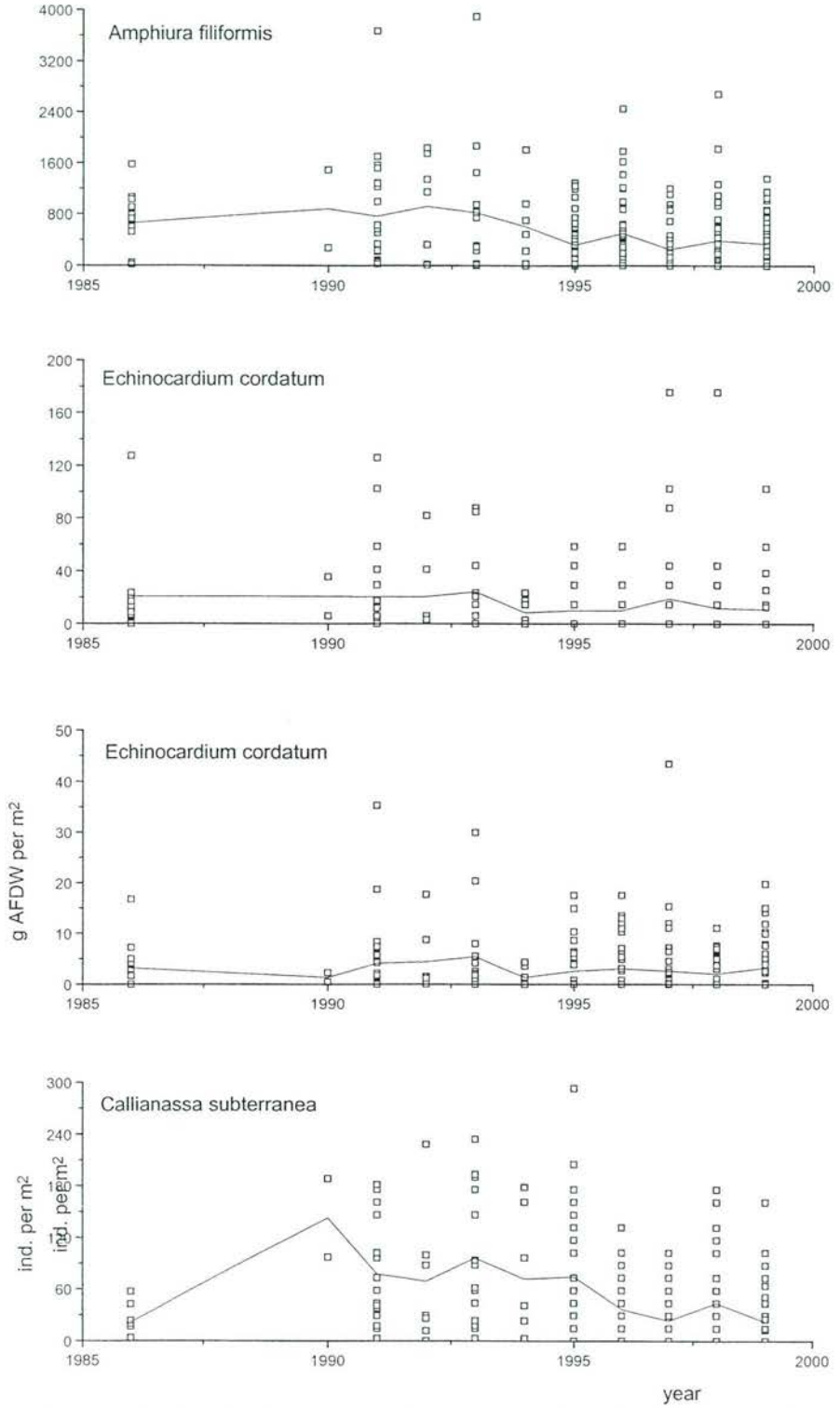


Fig. 21a: Densities (and biomass for E. cordatum) of 3 species in the Oyster Ground (1986-1999).

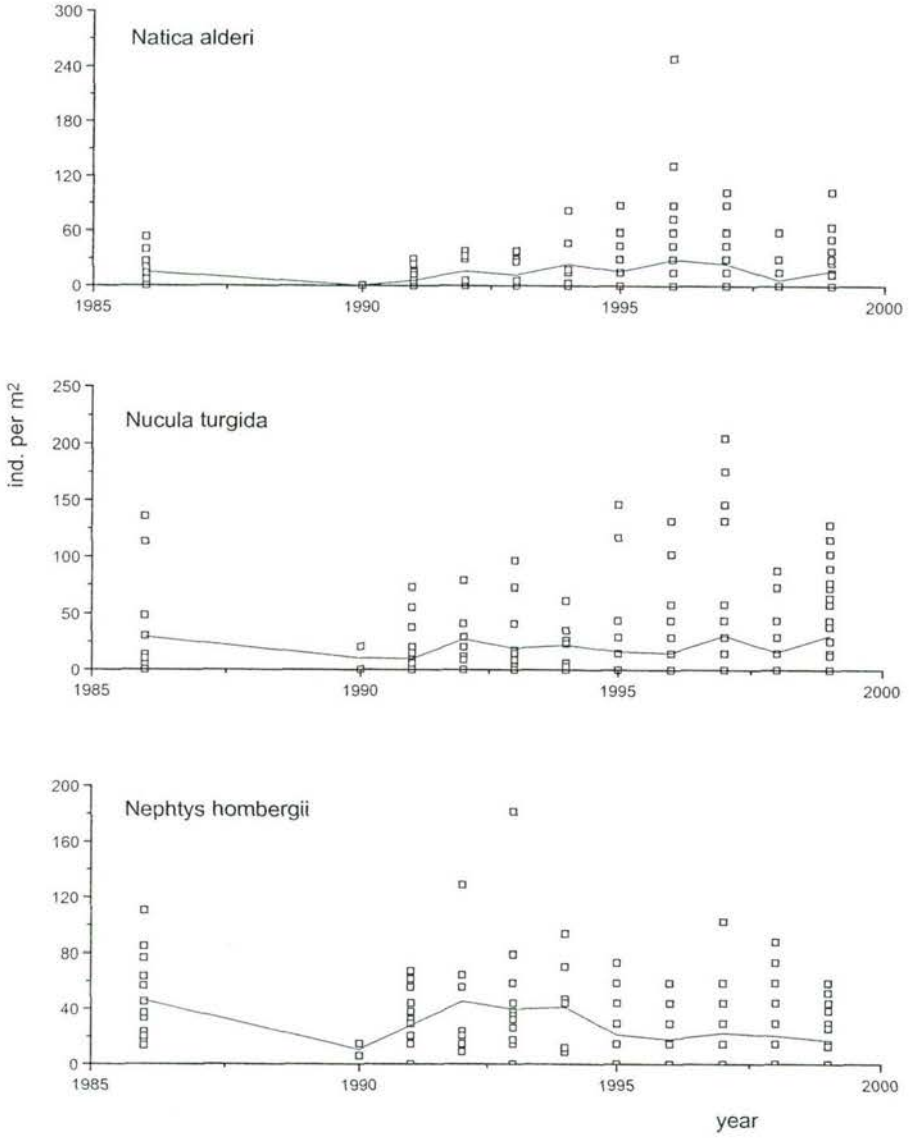


Fig. 21b: Densities of 3 species in the Oyster Ground (1986-1999)

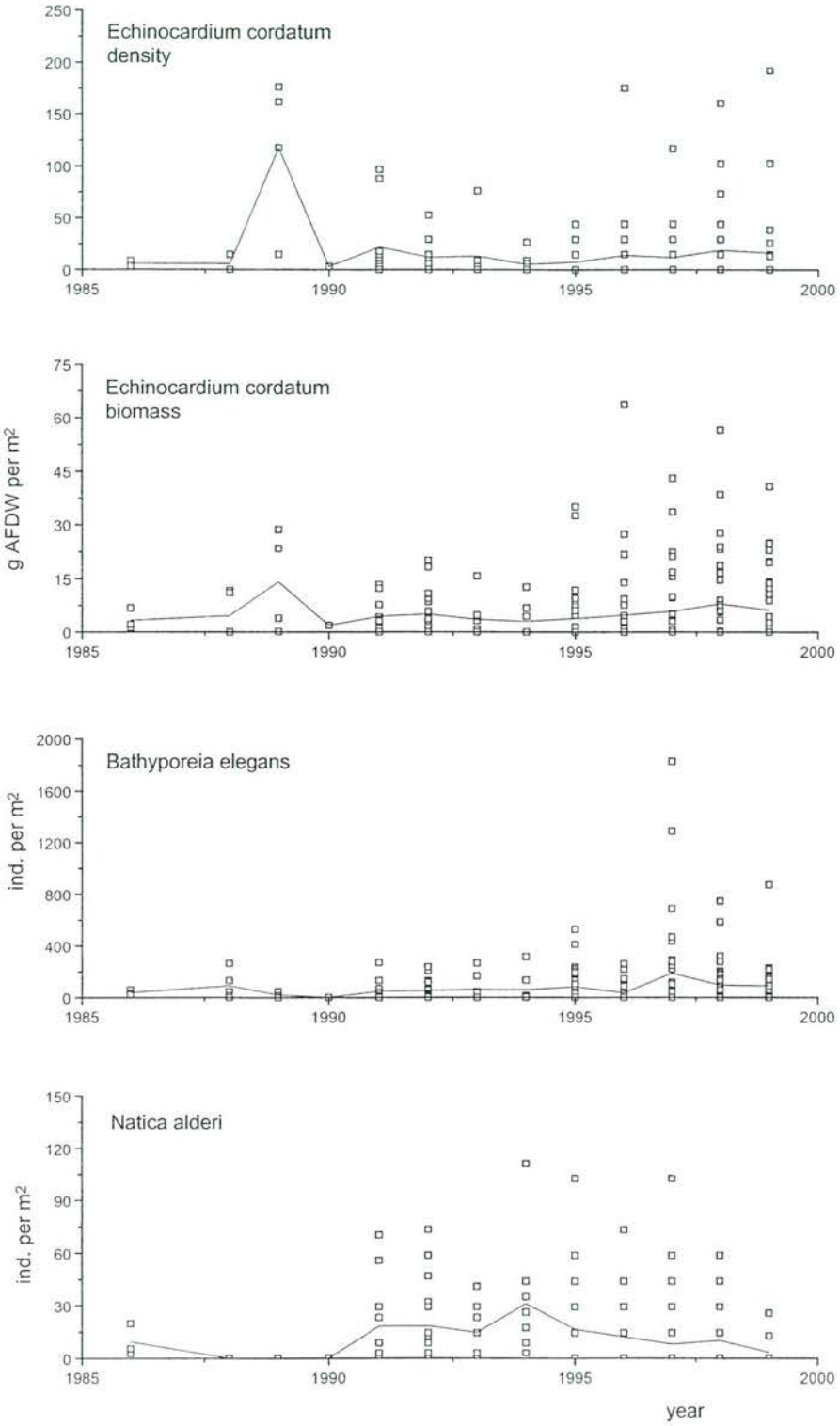


Fig. 22a: Densities (and biomass of E. cordatum) of 3 species in the offshore area (1986-1999).

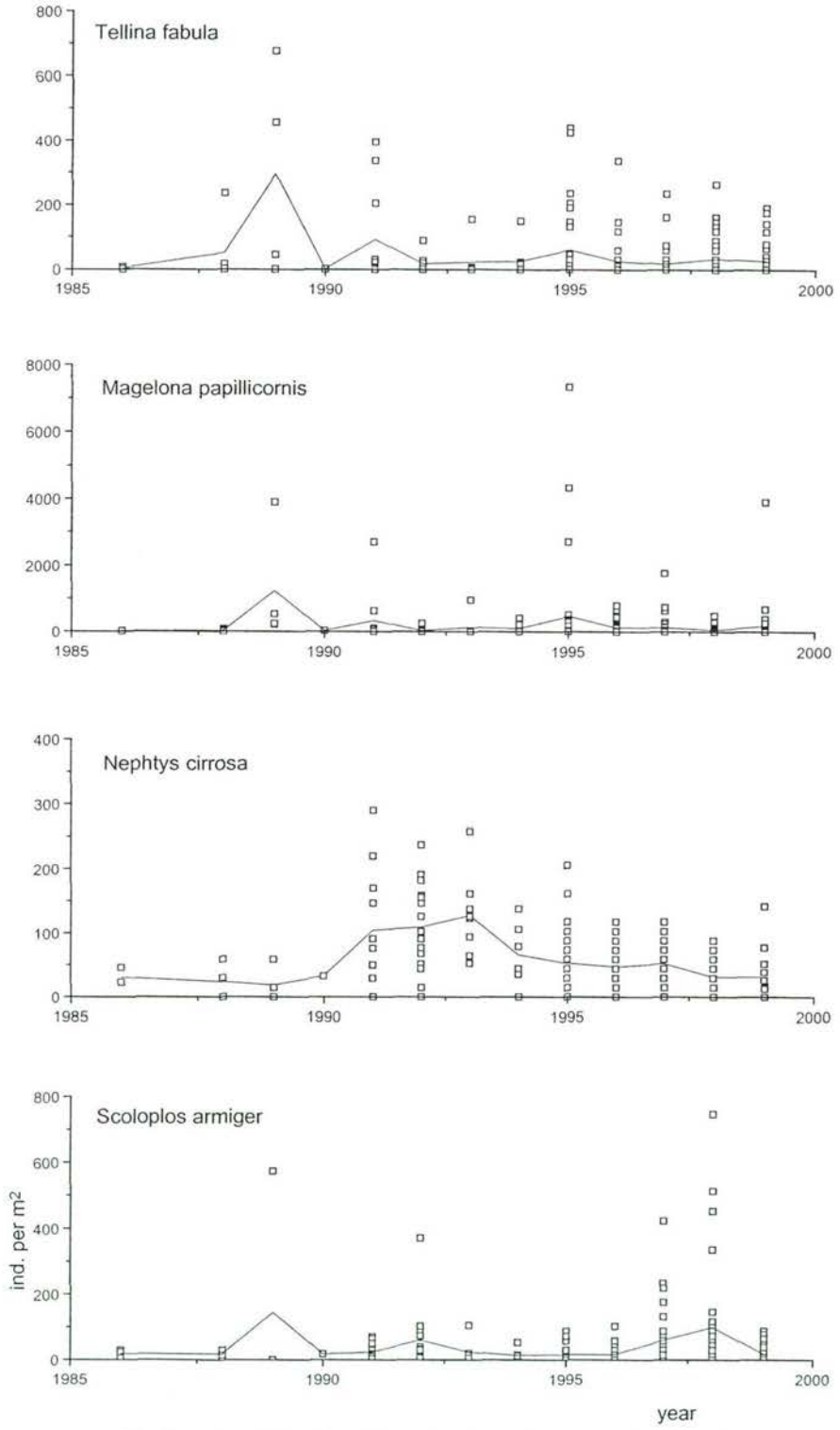


Fig. 22b: Densities of 4 species in the offshore area (1986-1999)

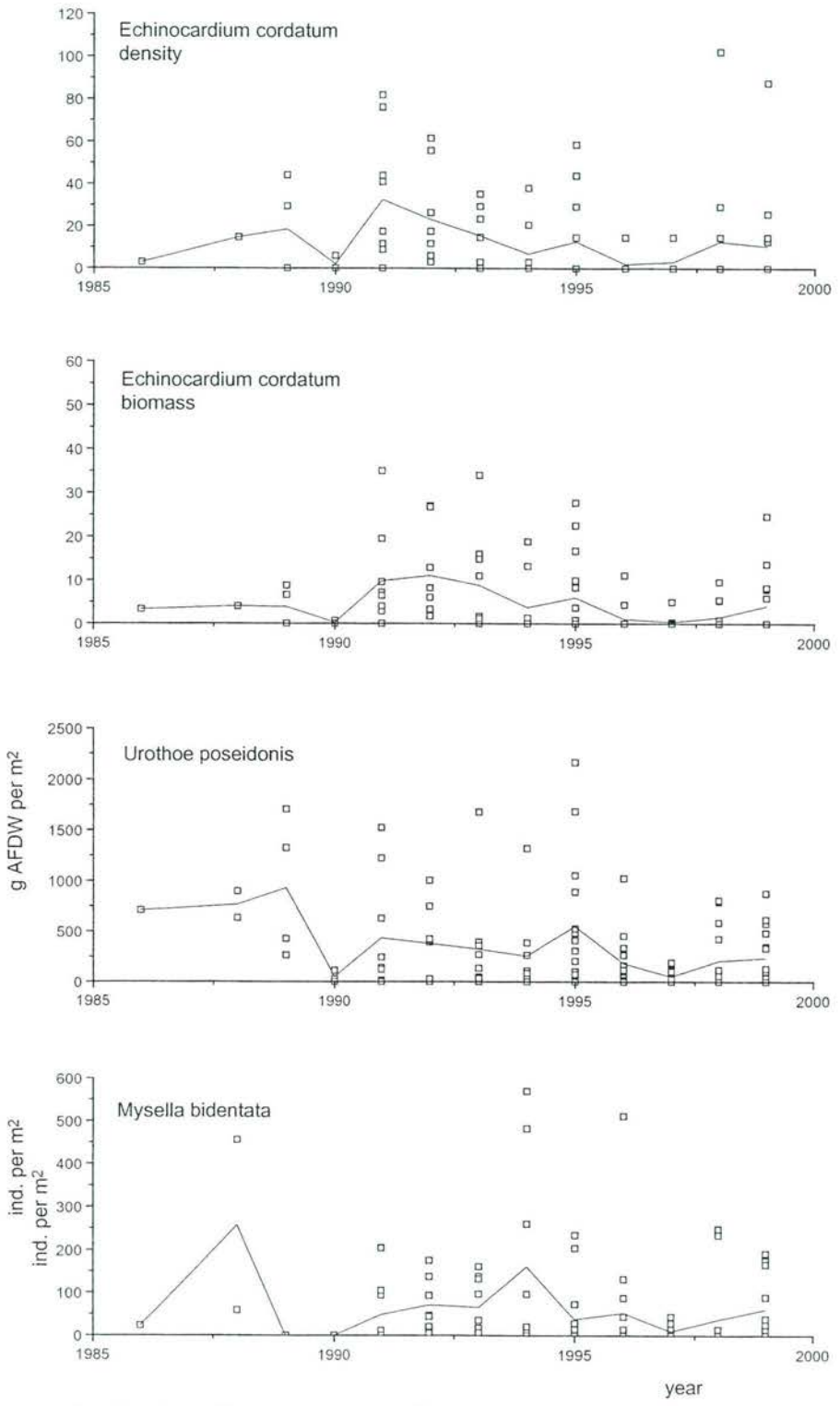


Fig. 23a: Densities (and biomass of E. cordatum) of 3 species in the coastal area (1986-1999).

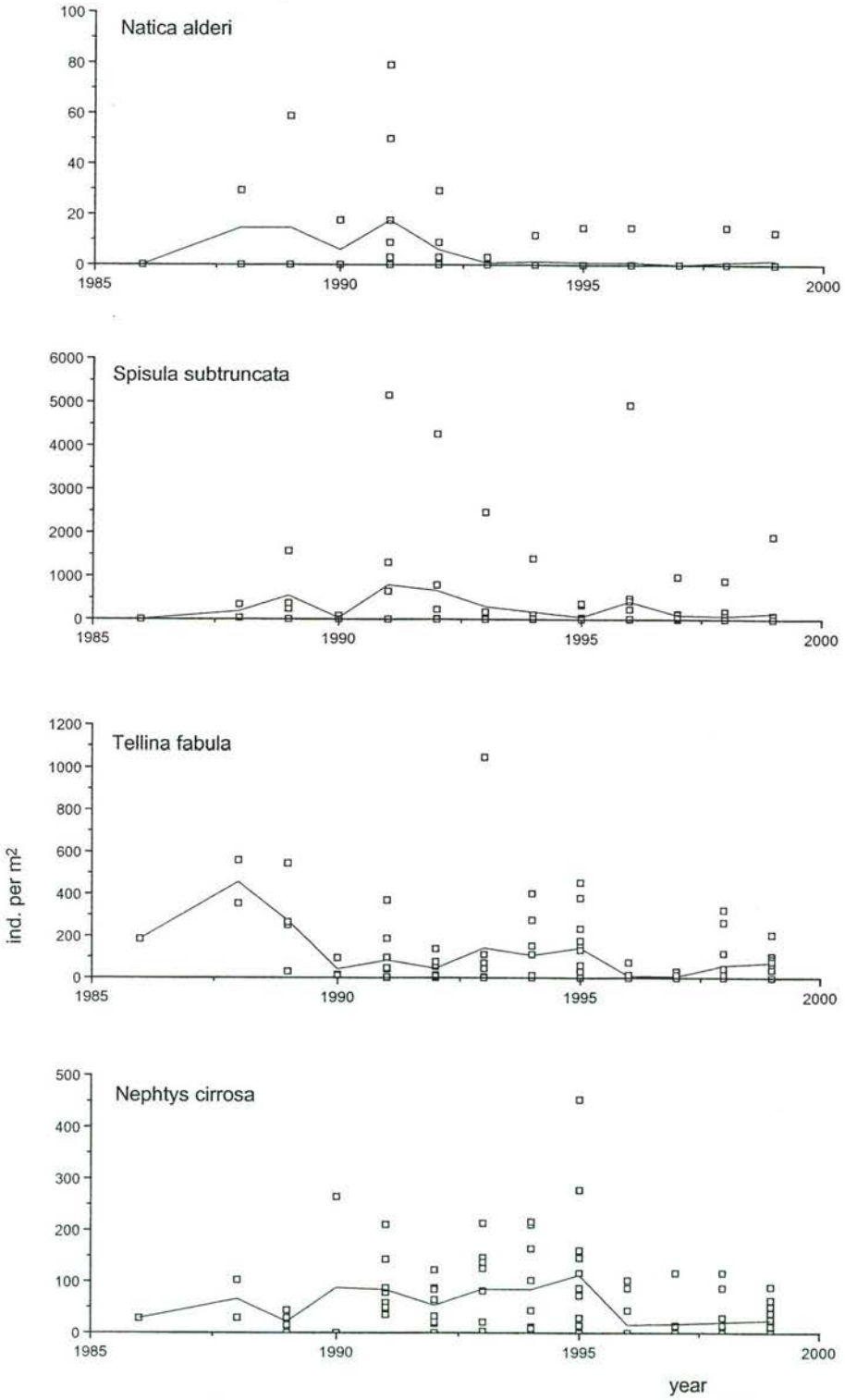
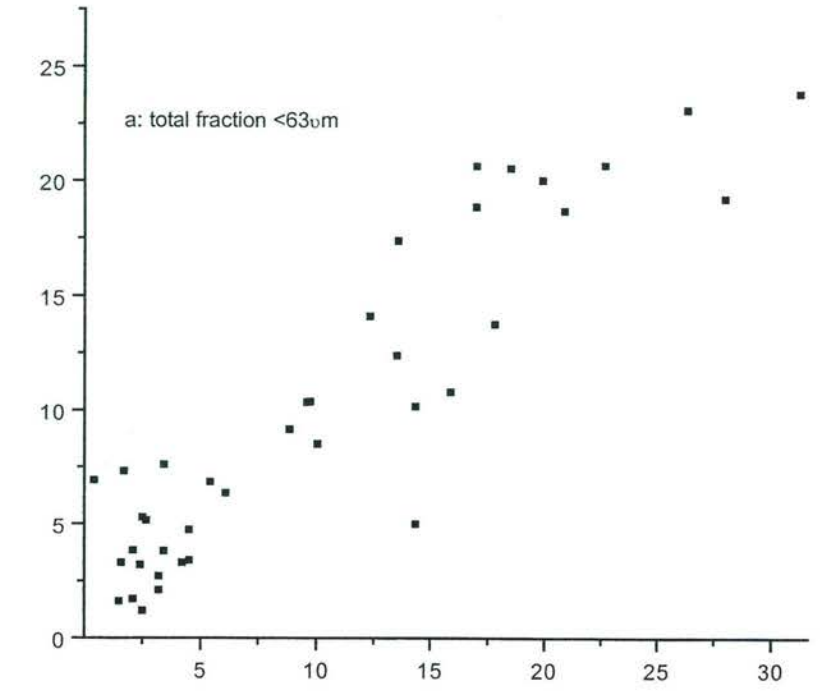


Fig. 23b: Densities of 4 species in the coastal area (1986-1999)



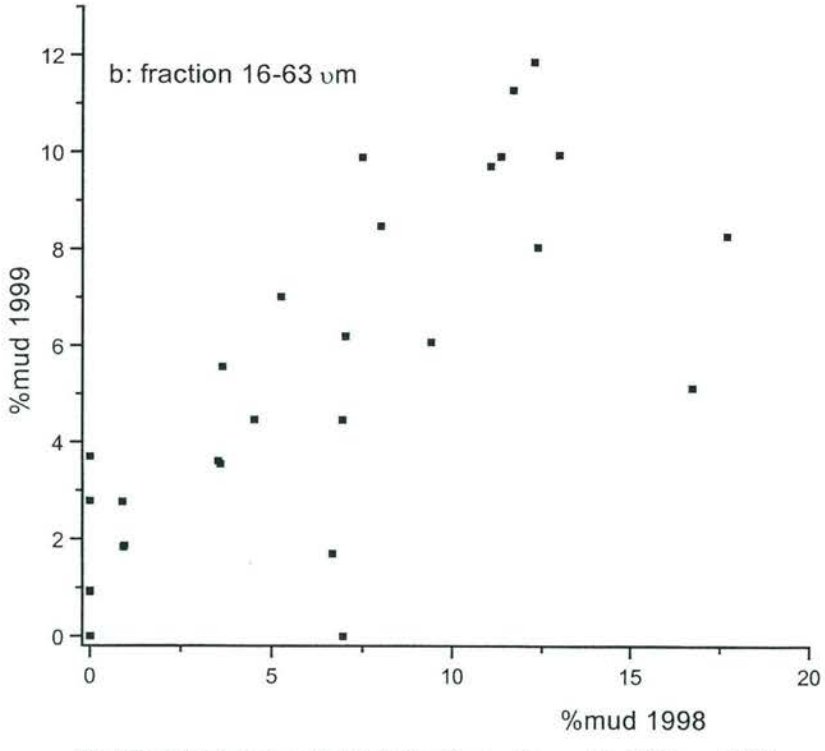


Fig. 24: Plot of mud contents in the Oyster Ground in 1999 vs. 1998.

Table1a. Station number, position, date, depth and sediment composition of the survey in 1999.

Station (name)			Geographical position				Sediment		
new		previously	E	N	Date	Depth (m)	Med. Gr. Size (μm)	Mud (%) fr. < 63 μm	Mud (%) fr. 16-63 μm
DOG	1	Dog E5	04°03'00"	55°28'18"	27/04/99	29.8	219	0.2	0.0
DOG	2	Dog D3	03°38'30"	55°10'00"	27/04/99	36.7	188	1.4	0.0
DOG	3	ICES 97/SM38	03°30'00"	55°15'00"	27/04/99	28.1	204	0.3	0.0
DOG	4	TS 235	03°09'26"	55°10'14"	08/04/99	30.1	201	2.8	0.0
DOG	5	Dog C5	03°14'00"	54°54'42"	08/04/99	36.0	181	1.2	0.0
DOG	6	Dog C6	03°05'00"	54°57'06"	08/04/99	22.7	240	0.3	0.0
DOG	7	ICES 87/SM 37	03°00'00"	55°00'00"	08/04/99	24.7	196	4.5	0.0
OYS	1	MZ 1-3 '91	03°25'30"	54°23'00"	28/04/99	46.3	129	6.9	3.3
OYS	2	MZ 9-1 '91	05°32'30"	54°11'30"	07/04/99	40.4	198	5.0	0.0
OYS	3	ICES 88/SM 39	04°00'00"	55°00'00"	27/04/99	48.4	113	11.3	4.5
OYS	4	Dog B5	02°56'00"	54°33'00"	28/04/99	34.4	139	7.5	1.1
OYS	5	MZ 8-3 '91	04°55'00"	54°01'10"	28/04/99	41.6	123	26.5	14.3
OYS	6	Dog E2	04°22'48"	55°18'24"	27/04/99	45.9	144	4.9	1.1
OYS	7	MZ 2-1 '91	04°18'00"	54°53'00"	27/04/99	50.6	88	25.2	16.5
OYS	8	MZ 12-4 '91	04°54'00"	53°44'40"	11/03/99	36.5	173	22.1	14.6
OYS	9	MZ 15-1 '93	03°37'50"	53°45'20"	10/03/99	37.5	173	3.2	0.0
OYS	10	MZ 1-1 '91	03°42'30"	54°39'00"	08/04/99	45.0	110	11.5	5.6
OYS	11	MZ 12-1 '91	05°10'00"	53°55'30"	28/04/99	39.2	131	23.6	9.5
OYS	12	MZ 5-4 '91	04°26'00"	54°10'00"	28/04/99	48.2	96	23.3	14.5
OYS	13	ICES 78/SM 31	03°30'00"	54°45'00"	08/04/99	43.0	110	10.1	6.5
OYS	14	MZ 5-3 '91	04°44'30"	54°20'00"	07/04/99	46.3	124	15.8	8.1
OYS	15	MZ 5-1 '91	04°21'20"	54°28'30"	08/04/99	50	93	24.6	14.5
OYS	16	MZ 3-4 '91	05°03'00"	54°38'30"	07/04/99	46.1	154	7.2	2.2
OYS	17	MZ 17-2 '93	03°25'08"	54°00'21"	11/03/99	42.8	192	4.0	1.1
OYS	18	MZ 10-2 '91	05°54'00"	54°11'20"	07/04/99	37.7	199	3.3	0.0
OYS	19	Dog B2	03°19'00"	54°20'00"	28/04/99	49.2	117	11.3	5.6
OYS	20	Dog A1	02°51'51"	54°05'00"	11/03/99	50.9	194	16.2	9.1
OYS	21	TS 50	04°46'03"	53°46'04"	11/03/99	38.0	110	35.9	19.9
OYS	22	MZ 1-4 '91	03°38'30"	54°18'30"	28/04/99	44.3	143	8.2	4.3
OYS	23	Dog C3	03°22'00"	54°49'24"	08/04/99	42.0	132	5.4	2.1
OYS	24	MZ 11-3 '93	03°29'46"	53°30'00"	10/03/99	32.7	130	12.7	6.0
OYS	25	MZ 2-3 '91	04°32'00"	54°39'00"	08/04/99	49.5	105	22.6	15.0
OYS	26	MZ 8-5 '91	04°47'30"	53°55'20"	28/04/99	41.3	124	30.1	15.0
OYS	27	ICES 70/SM 60	05°00'00"	54°30'00"	07/04/99	43.0	171	1.2	0.0
OYS	28	ICES 42/SM 19	03°30'00"	53°45'00"	10/03/99	35.6	190	2.7	0.0
OYS	29	ICES 68/SM 32	03°00'00"	54°30'00"	28/04/99	36.8	122	5.7	3.2
OYS	30	MZ 11-1 '93	03°18'21"	53°31'30"	10/03/99	34.4	125	14.8	8.3
OYS	31	MZ 19-2 '93	04°09'06"	53°50'42"	11/03/99	43.0	139	6.9	0.0
OYS	32	MZ 6-5 '91	05°05'00"	54°15'30"	07/04/99	44.2	148	11.5	2.4
OYS	33	MZ 4-1 '91	04°03'00"	54°16'00"	28/04/99	47.8	105	14.1	7.9
OYS	34	MZ 16-3 '93	04°16'37"	53°37'40"	11/03/99	37.0	112	28.4	17.4
OYS	35	MZ 18-3 '93	03°52'24"	53°51'31"	11/03/99	39.6	152	3.4	0.0
OYS	36	META 2	04°30'00"	53°42'05"	11/03/99	38.3	105	33.0	17.4
OYS	37	TS 100	04°20'27"	54°09'04"	28/04/99	48.6	98	20.3	10.9
OYS	38	ICES 34/SM 20	03°00'00"	53°30'00"	10/03/99	31.6	141	9.3	3.5
OYS	39	ICES 69/SM 30	04°00'00"	54°30'00"	08/04/99	45.0	113	9.3	4.4
OYS	40	ICES 89/SM 58	05°00'00"	55°00'00"	27/04/99	41.1	152	3.3	0.0
OYS	41	RHC 4/Dog C4	03°17'36"	54°51'42"	08/04/99	39.6	148	3.8	0.0
OYS	42	R 70	06°12'51"	54°07'03"	07/04/99	32.7	214	0.7	0.0

Table1b. Station number, position, date, depth and sediment composition of the survey in 1999.

Station (name)			Geographical position				Sediment		
new		previously	E	N	Date	Depth (m)	Med. Gr.	Mud (%)	Mud (%)
							Size (μm)	fr. < 63 μm	fr. 16-63 μm
OFF	1	MZ 18-2 '91	05°59'00"	53°51'30"	07/04/99	30.1	198	1.6	0.0
OFF	2	MZ VIA-12-25-2 '89	06°06'25"	53°37'29"	29/04/99	22.2	330	0.5	0.0
OFF	3	MZ VA-12-25-3 '89	05°49'37"	53°36'40"	29/04/99	24.3	194	7.1	1.1
OFF	4	MZ 16-3 '91	04°57'30"	53°40'00"	11/03/99	31.0	190	2.1	0.0
OFF	5	MZ 14-1 '91	04°22'30"	53°29'00"	26/04/99	28.1	211	1.7	0.0
OFF	6	MZ IIA-12-25-2 '89	04°26'32"	53°11'16"	24/03/99	30.5	323	3.8	0.0
OFF	7	MZ IA-25-40-4 '89	04°18'22"	53°05'59"	24/03/99	35.6	227	2.8	0.0
OFF	8	MZ C-40-65-4 '88	04°00'30"	53°01'30"	24/03/99	30.4	241	0.5	0.0
OFF	9	MZ B-25-40-2 '88	04°13'50"	52°49'20"	24/03/99	26.2	263	0.4	0.0
OFF	10	MZ W-40-65-3 '88	03°50'30"	52°45'40"	24/03/99	30.5	283	0.2	0.0
OFF	11	MZ 10-4 '92	03°31'18"	53°17'00"	10/03/99	27.0	200	1.6	0.0
OFF	12	MZ 9-2 '92	03°23'30"	53°03'55"	10/03/99	28.2	259	0.6	0.0
OFF	13	MZ 9-1 '92	03°11'36"	53°02'58"	10/03/99	29.5	268	0.8	0.0
OFF	14	MZ 8-2 '92	03°17'20"	52°53'53"	09/03/99	32.8	276	0.5	0.0
OFF	15	MZ 8-5 '92	03°17'18"	52°50'12"	09/03/99	33.4	299	0.4	0.0
OFF	16	ICES 20/SM 3	03°30'00"	52°45'00"	09/03/99	27.7	261	0.3	0.0
OFF	17	MZ 6-2 '92	03°12'12"	52°27'43"	25/03/99	34.4	295	0.9	0.0
OFF	18	MZ 6-1 '92	03°11'25"	52°20'25"	25/03/99	31.6	304	0.9	0.0
OFF	19	MZ 1-1 '92	03°24'42"	52°15'10"	25/03/99	31.6	349	0.5	0.0
OFF	20	ICES 15/SM 5	03°30'00"	52°15'00"	25/03/99	30.5	398	0.8	0.0
OFF	21	ICES 12/SM 10	03°00'00"	52°00'00"	25/03/99	35.0	490	0.3	0.0
OFF	22	MZ T-25-40-3 '88	03°59'15"	52°16'30"	12/03/99	24.3	374	0.3	0.0
OFF	23	MZ N-12-25-1 '88	04°09'50"	52°23'08"	06/04/99	21.6	328	0.4	0.0
OFF	24	/	03°42'58"	52°00'00"	26/03/99	25.5	518	0.2	0.0
OFF	25	/	03°24'26"	52°06'12"	25/03/99	33.0	404	0.2	0.0
OFF	26	/	03°11'34"	51°56'07"	25/03/99	31.3	448	0.0	0.0
OFF	27	/	03°14'28"	51°41'40"	25/03/99	28.8	425	0.8	0.0
OFF	28	/	02°52'48"	51°52'40"	25/03/99	33.5	406	0.1	0.0
OFF	29	R 50	06°18'36"	53°57'14"	07/04/99	29.8	372	0.3	0.0
OFF	30	TS 30	04°56'17"	53°36'56"	11/03/99	24.9	213	0.9	0.0
OFF	31	META 1	03°55'01"	52°59'53"	24/03/99	27.0	255	0.6	0.0
OFF	32	N 30	04°02'53"	52°23'15"	06/04/99	22.4	334	0.1	0.0
OFF	33	N 50	03°47'07"	52°28'30"	12/03/99	29.9	271	2.9	0.0
OFF	34	N 70	03°31'53"	52°34'10"	12/03/99	31.4	310	0.2	0.0
OFF	35	W 30	03°06'49"	51°43'06"	25/03/99	32.5	328	0.6	0.0
OFF	36	W 70	02°40'45"	51°57'25"	25/03/99	43.0	399	0.2	0.0
COA	1	MZ VIA-05-12-1 '89	05°59'53"	53°32'34"	29/04/99	16.5	205	0.6	0.0
COA	2	MZ VA -00-05-5 '89	05°37'48"	53°30'19"	29/04/99	10.4	187	1.1	0.0
COA	3	MZ W-00-05-5 '88	04°31'50"	52°32'50"	24/03/99	18.5	227	3.0	0.0
COA	4	MZ C-00-05-5 '88	04°40'00"	52°50'00"	24/03/99	10.1	235	1.1	0.0
COA	5	MZ IB-00-05-5 '89	04°41'20"	53°03'23"	24/03/99	11.4	227	0.7	0.0
COA	6	MZ VIB-00-05-3 '89	06°11'03"	53°32'09"	29/04/99	12.9	176	1.3	0.0
COA	7	R 3	06°32'46"	53°34'57"	28/04/99	16.4	164	1.2	0.0
COA	8	TS 4	05°09'02"	53°24'54"	29/04/99	13.1	214	0.5	0.0
COA	9	ICES 21/SM 1	04°30'00"	52°45'00"	24/03/99	20.1	233	0.4	0.0
COA	10	N 2	04°24'20"	52°15'36"	04/03/99	12.1	236	0.7	0.0
COA	11	N 10	04°18'01"	52°17'41"	04/03/99	18.7	311	0.4	0.0
COA	12	VD 1	03°23'15"	51°37'04"	04/03/99	12.3	269	0.8	0.0
COA	13	VD 2	03°36'02"	51°42'23"	25/03/99	3.6	263	0.4	0.0
COA	14	VD 3	03°48'48"	51°47'26"	25/03/99	3.4	298	0.3	0.0
COA	15	VD 4	03°55'09"	51°55'20"	04/03/99	14.8	198	1.1	0.0

Table 2. Mean values of abiotic and biotic parameters in the 4 areas in 1999.

	AREA			
	Dogger Bank	Oyster Ground	Offshore area	Coastal area
No. of stations	7	42	36	15
Median Grain Size (µm)	204.0	138.0	312.0	230.0
Mud content (fr.< 63um,%)	1.5	13.0	1.0	0.9
Mud (fr. 16- 63um, %)	0.0	6.4	0.0	0.0
Depth (m)	30	42	29	12
Diversity:				
Total number of species	80	135	87	54
Number of specier per core	35.9	29.1	14.2	13.2
Shannon- Wiener diversity	2.72	2.53	2.08	1.83
Simpson's dominance	0.11	0.15	0.17	0.26
No. individuals (ind./m²):				
Crustaceans	1098	197	290	410
Echinoderms	250	453	35	23
Molluscs	334	377	58	433
Polychaetes	1367	532	354	701
Miscellaneous	240	155	28	23
TOTAL DENSITY	3289	1714	765	1590
Biomass (g AFDW/m²):				
Crustaceans	0.29	3.38	0.67	0.25
Echinoderms	5.40	6.42	6.29	4.16
Molluscs	1.80	0.80	1.92	23.47
Polychaetes	6.41	3.73	1.31	2.76
Miscellaneous	0.50	0.72	0.11	0.14
TOTAL BIOMASS	14.40	15.05	10.30	30.78

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
ABRA ALBA									+			+	+		+		+	+	+	+		+	+			ABRAALBA
ABRA NITIDA								+					+	+			+									ABRANITI
ABRA PRISMATICA																										ABRAPRIS
ACROCNIDA BRACHIATA		+	+	+	+		+				+															ACROBRAC
AMPELISCA BREVICORNIS	+		+																							AMPEBREV
AMPELISCA TENUICORNIS											+			+	+				+							AMPETENU
AMPHARETE ACUTIFRONS														+												AMPHACUT
AMPHARETE FINMARCHICA																		+					+			AMPHFINM
AMPHIOXUS LANCEOLATUS			+	+									+					+		+			+			AMPHLANC
AMPHIURA CHIAJEI	+	+	+			+	+																			AMPHCHIA
AMPHIURA FILIFORMIS	+	+						+	+	+		+	+	+	+	+	+	+	+	+			+	+	+	AMPHFILI
AMPHIURA SPEC. JUV.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	AMPHJUVE
ANAITIDES GROENLANDICA																										ANAIGROE
ANAITIDES MUCOSA			+																							ANAIMUCO
ANAITIDES SPEC. JUV.					+																					ANAIJUVE
ANTHOZOA SPEC.																										ANTHOZOA
AONIDES PAUCIBRANCHIATA																										AONIPAUC
APHELOCHAETA MARIONI																										APHEMARI
APHERUSA SPEC.									+										+							APHERUSA
APISTOBRANCHUS TULLBERGI	+																									APISTULL
ARCTICA ISLANDICA JUV.	+		+	+	+									+			+					+				ARCTISLA
ARICIDEA MINUTA										+																ARICMINU
ARICIDEA SUECICA																										ARICSUEC
ASTROPECTEN IRREGULARIS										+																ASTRIRRE
ATYLUS FALCATUS	+			+		+	+																			ATYLFALC
ATYLUS SWAMMERDAMI																										ATYLSWAM
BATHYPOREIA ELEGANS	+	+	+	+	+	+	+	+					+		+	+				+				+	+	BATHELEG
BATHYPOREIA GUILLIAMSONIANA	+	+	+	+	+	+	+						+													BATHGUIL
BATHYPOREIA TENUIPES					+	+	+																			BATHTENU
BATHYPOREIA JUV.																										BATHSPEC
BRISSOPSIS LYRIFERA																	+									BRISLYRI
CALLIANASSA JUV.									+	+			+	+	+	+			+		+	+	+	+	+	CALLJUVE
CALLIANASSA SUBTERRANEA								+	+	+					+	+	+	+	+		+	+				CALLSUBT
CALLIANASSA TYRRHENA																										CALLTYRR
CAPITELLA CAPITATA																										CAPICAPI
CAPITELLIDAE SPEC.							+																			CAPISPEC
CAPRELLIDAE SPEC.					+																					CAPRELLI
CARCINUS MAENAS																										CARCMAEN
CERIANTHUS LLOYDII																			+							CERILLOY
CHAETOPTERUS VARIOPEDATUS									+	+		+										+	+			CHAEVARI
CHAETOZONE SETOSA	+		+	+	+	+	+	+	+	+			+	+		+	+			+	+	+	+	+	+	CHAESETO
CHAMELEA STRIATULA JUV.							+				+			+	+		+			+		+				CHAMSTRI
CHONE DUNERI	+																									CHONDUNE
CIRRATULIDAE SPEC.																	+									CIRRATUL
CORBULA GIBBA				+			+		+	+		+		+			+	+			+	+	+		+	CORBGIBB
COROPHIUM INSIDIOSUM				+		+	+																			COROINSI
CORYSTES CASSIVELAUNUS	+				+			+																		CORYCASS
CUCUMARIA FRONDOSA																										CUCUFRON
CULTELLUS PELLUCIDUS		+		+	+		+		+	+			+			+	+						+			CULTPELL
CUMACEA SPEC																										CUMACEA
CYLICHNA CILINDRACEA		+	+				+	+		+		+	+	+			+			+	+	+	+			CYLICILI
DEVONIA PERRIERI																						+				DEVOPERR
DIASTYLIS BRADYI			+			+		+		+				+				+			+			+		DIASBRAD
DIPLOCIRRUS GLAUCUS										+		+	+	+		+						+	+			DIPLGLAU

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
DONAX VITTATUS						+	+																			DONAVITT
DOSINIA LUPINUS	+		+																			+				DOSILUPI
DOSINIA SPEC. JUV.		+																								DOSIJUVE
EBALIA CRANCHII									+																	EBALCRAN
EBALIA GRANULOSA				+																						EBALGRAN
ECHINOCARDIUM CORDATUM		+			+				+	+	+	+						+		+			+			ECHICORD
ECHINOCYAMUS PUSSILLUS							+																			ECHIPUSS
EDWARDSIA CLAPAREDII	+	+		+		+	+						+					+	+			+	+		EDWACLAP
ENSIS AMERICANUS																										ENSIAMER
ENSIS ARCUATUS																										ENSIARCU
ENSIS ENSIS						+	+																			ENSIENSI
ENSIS SPEC.					+																					ENSISPEC
ETEONE FOLIOSA																+	+				+					ETEOFOLI
ETEONE LONGA					+	+	+																			ETEOLONG
EUDORELLA TRUNCATULA									+					+				+	+	+	+	+	+			EUDOTRUN
EUDORELLOPSIS DEFORMIS								+					+	+						+		+	+	+		EUDODEFO
EUMIDA SANGUINEA			+															+			+					EUMISANG
EURIDYCE PULCHRA																										EURIPULC
EUZONUS FLABELLIGERUS																										EUZOFLAB
EXOGONE HEBES																										EXOGHEBE
EXOGONE NAIDINA																										EXOGNAID
GARI FERVENSIS				+	+																					GARIFERV
GATTYANA CIRROSA									+			+										+	+			GATTCIRR
GLYCERA LAPIDUM																										GLYCLAPI
GLYCERA ROUXI																			+							GLYCROUX
GLYCERA SPEC. JUV.					+					+		+		+									+			GLYCJUVE
GLYCINDE NORDMANNI								+				+		+	+							+				GLYCNORD
GOLFINGIA ELONGATA												+			+			+			+	+				GOLFELON
GOLFINGIA PROCERA																										GOLFPROC
GOLFINGIA VULGARIS																						+				GOLFVULG
GONIADA MACULATA	+	+	+	+	+		+	+	+		+	+	+		+			+	+	+		+				GONIMACU
GYPTIS CAPENSIS			+				+		+		+	+			+											GYPTCAPE
HARMOTHOE GLABRA		+																								HARMGLAB
HARMOTHOE LONGISETIS																		+								HARMLONG
HARMOTHOE LUNULATA					+																					HARMLUNU
HARMOTHOE SPEC. JUV.	+			+		+	+				+															HARMJUVE
HARPINIA ANTENNARIA	+							+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	HARPANTE
HIPPOMEDON DENTICULATUS				+																						HIPPDENT
HYALA VITREA								+				+						+	+				+			HYALVITR
IONE THORACICA													+													IONETHOR
IPHINOE TRISPINOSA	+			+	+	+	+				+															IPHITRIS
LANICE CONCHILEGA	+	+	+		+																					LANICONC
LANICE JUV.																										LANIJUVE
LEMBOS LONGIPES																										LEMBLONG
LEPTON SQUAMOSUM														+				+	+							LEPTSQUA
LEUCOTHOE INCISA	+		+	+	+		+				+															LEUCINCI
LUCINOMA BOREALIS			+																							LUCIBORE
LUMBRINERIS FRAGILIS																			+							LUMBFRAG
LUMBRINERIS LATREILLI												+							+		+		+			LUMBLATR
LUMBRINERIS SPEC. JUV.															+							+				LUMBJUVE
LUTRARIA LUTRARIA																										LUTRLUTR
LYSILLA LOVENI																										LYSILOVE
MACOMA BALTHICA																										MACOBALT
MAGELONA ALLENI	+	+															+								+	MAGEALLE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
MAGELONA PAPILLICORNIS	+	+	+	+	+	+	+	+	+		+	+	+	+		+							+	+	+	MAGEPAPI
MEDIOMASTUS FRAGILIS															+		+					+	+			MEDIFRAG
MEGALUROPUS AGILIS						+	+																			MEGAAGIL
MONTACUTA FERRUGINOSA		+		+		+			+		+	+					+			+		+	+			MONTFERR
MYRIOCHELE HEERI														+				+	+							MYRIHEER
MYSELLA BIDENTATA	+	+	+	+	+		+	+		+	+	+	+		+		+	+	+	+	+		+	+		MYSEBIDE
MYSELLA DAWSONIA																										MYSEDAWS
MYSIA UNDATA										+							+									MYSIUNDA
NATICA ALDERI	+	+	+		+				+			+		+		+		+	+		+		+		+	NATIALDE
NATICA CATENA			+																							NATICATE
NEBALIA BIPES																										NEBABIPE
NEMERTINI	+	+	+	+	+	+	+		+	+	+	+			+	+		+		+	+		+		+	NEMERTIN
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 TURGIDA								+	+	+			+	+	+	+	+	+		+	+		+	+		NUCUTURG
OLIGOCHAETA															+											OLIGOCHA
OPHELIA LIMACINA	+					+																				OPHELIMA
OPHELIIDAE SPEC.																										OPHESPEC
OPHELINA ACUMINATA												+														OPHEACUM
OPHIODROMUS FLEXUOSUS								+					+	+	+						+	+		+	+	OPHIFLEX
OPHIURA ALBIDA																		+								OPHIALBI
OPHIURA TEXTURATA																										OPHITEXT
OPHIURA SPEC. JUV.					+		+		+		+	+	+		+			+					+		+	OPHISPEC
ORBINIA SERTULATA																										ORBISERT
ORCHOMENE HUMILIS	+																									ORCHHUMI
ORCHOMENE NANA																										ORCHNANA
OWENIA FUSIFORMIS	+		+			+	+																+			OWENFUSI
PARAONIS FULGENS																		+	+							PARAFULG
PARAONIS GRACILIS											+			+							+	+				PARAGRAC
PECTINARIA AURICOMA										+											+		+			PECTAURI
PECTINARIA KORENI										+		+			+											PECTKORE
PERIOCULODES LONGIMANUS	+					+												+							+	PERILONG
PHOLOE MINUTA	+	+	+		+		+	+		+	+	+	+	+	+		+	+		+		+	+			PHOLMINU
PHORONIDA	+		+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+		+	+		+	PHORONID
PHYLLODOCE ROSEA				+			+								+											PHYLROSE
PHYLLODOCIDAE SPEC.																				+				+		PHYLSPEC
PODARKEOPSIS HELGOLANDICA																										PODAHELG
POECILOCHAETUS SERPENS	+								+															+	+	POECSERP
POLYDORA SPEC.																										POLYDORA
PONTOCRATES ALTAMARINUS							+																			PONTALTA
PRIONOSPIO CIRRIFERA														+										+		PRIOCIRR
PROCESSA PARVA																										PROCPARV
PSEUDOCUMA LONGICORNIS				+																						PSEULONG
RHODINE LOVENI														+												RHODLOVE
SCALIBREGMA INFLATUM		+			+				+																	SCALINFL
SCOLELEPIS BONNIERI		+		+		+																			+	SCOLBONN
SCOLELEPIS SPEC. JUV.							+																			SCOLJUVE
SCOLOPLOS ARMIGER										+			+				+								+	SCOLARME

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
SCOPELOCHEIRUS HOPEI			+																							SCOPHOPE
SIGALION MATHILDAE	+	+	+	+	+											+										SIGAMATH
SIPUNCULIDA SPEC.																	+		+				+			SIPUNCUL
SPHAERODORUM FLAVUM										+			+													SPHAFLAV
SPIO FILICORNIS			+	+		+		+			+	+		+					+							SPIOFILI
SPIOPHANES BOMBYX	+	+	+	+	+	+	+		+	+	+		+		+	+	+			+	+		+		+	SPIOBOMB
SPIOPHANES KROEYERI																						+				SPIOKROE
SPISULA ELLIPTICA																										SPISELLI
SPISULA SOLIDA																										SPISSOLI
SPISULA SUBTRUNCATA																										SPISSUBT
SPISULA SPEC. JUV.		+																				+				SPISJUVE
STHENELAIS LIMICOLA										+		+	+							+				+		STHELIMI
SYLLIDAE SPEC.																										SYLLIDAE
SYNCHELIDIUM MACULATUM	+		+	+	+	+	+					+														SYNCMACU
SYNELMIS KLATTI										+			+					+	+		+	+	+			SYNEKLAT
TELLINA FABULA	+	+	+	+	+	+	+				+															TELLFABU
TELLINA PYGMEA																										TELLPYGM
TELLINA TENUIS																										TELLTENU
TEREBELLIDES STROEMI												+		+												TERESTRO
THIA SCUTELLATA																										THIASCUT
THRACIA PHASEOLINA	+	+	+				+			+	+				+											THRAPHAS
THYASIRA FLEXUOSA								+			+		+							+			+			THYAFLEX
TRAVISIA FORBESII																										TRAVFORB
TURBELLARIA SPEC.									+						+			+	+			+	+			TURBELLA
TURRITELLA COMMUNIS															+											TURRCOMM
UNCIOLA PLANIPES																										UNCIPLAN
UPOGEBIA DELTAURA															+			+								UPOGDELT
UPOGEBIA STELLATA														+												UPOGSTEL
UROTHOE BREVICORNIS									+																	UROTBREV
UROTHOE ELEGANS																+								+	+	UROTELEG
UROTHOE POSEIDONIS	+	+	+	+		+	+						+			+					+					UROTPOSE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		*Code*
ABRA ALBA		+	+		+			+		+	+	+		+		+		+		+	+		+			ABRAALBA
ABRA NITIDA						+					+	+	+			+			+	+	+					ABRANITI
ABRA PRISMATICA																										ABRAPRIS
ACROCNIDA BRACHIATA											+												+			ACROBRAC
AMPELISCA BREVICORNIS				+							+										+					AMPEBREV
AMPELISCA TENUICORNIS	+												+		+				+		+		+			AMPETENU
AMPHARETE ACUTIFRONS																										AMPHACUT
AMPHARETE FINMARCHICA																										AMPHFINM
AMPHIOXUS LANCEOLATUS					+									+		+										AMPHLANC
AMPHIURA CHIAJEI							+																+			AMPHCHIA
AMPHIURA FILIFORMIS	+	+	+	+	+		+	+					+	+	+	+	+	+	+		+	+	+			AMPHFILI
AMPHIURA SPEC. JUV.	+	+	+	+	+		+	+				+	+	+	+		+		+		+	+	+			AMPHJUVE
ANAITIDES GROENLANDICA																										ANAIGROE
ANAITIDES MUCOSA																										ANAIMUCO
ANAITIDES SPEC. JUV.																										ANAIJUVE
ANTHOZOA SPEC.																										ANTHOZOA
AONIDES PAUCIBRANCHIATA																										AONIPAUC
APHELOCHAETA MARIONI							+						+		+				+		+					APHEMARI
APHERUSA SPEC.		+																								APHERUSA
APISTOBRANCHUS TULLBERGI																										APISTULL
ARCTICA ISLANDICA JUV.		+			+					+			+		+				+		+				+	ARCTISLA
ARICIDEA MINUTA																										ARICMINU
ARICIDEA SUECICA													+													ARICSUEC
ASTROPECTEN IRREGULARIS																					+					ASTRIRRE
ATYLUS FALCATUS																										ATYLFALC
ATYLUS SWAMMERDAMI																										ATYLSWAM
BATHYPOREIA ELEGANS		+		+	+	+			+	+	+		+				+			+	+	+	+	+		BATHELEG
BATHYPOREIA GUILLIAMSONIANA																									+	BATHGUIL
BATHYPOREIA TENUIPES																+	+	+								BATHTENU
BATHYPOREIA JUV.																										BATHSPEC
BRISSOPSIS LYRIFERA		+																								BRISLYRI
CALLIANASSA JUV.	+	+	+	+	+	+		+		+		+	+	+	+		+	+	+	+	+					CALLJUVE
CALLIANASSA SUBTERRANEA		+	+	+		+		+		+		+	+		+	+		+	+							CALLSUBT
CALLIANASSA TYRRHENA																										CALLTYRR
CAPITELLA CAPITATA																										CAPICAPI
CAPITELLIDAE SPEC.																										CAPISPEC
CAPRELLIDAE SPEC.																										CAPRELLI
CARCINUS MAENAS																										CARCMAEN
CERIANTHUS LLOYDII																			+							CERILLOY
CHAETOPTERUS VARIOPEDATUS							+							+												CHAEVARI
CHAETOZONE SETOSA	+			+	+		+		+			+		+						+	+	+	+	+		CHAESETO
CHAMELEA STRIATULA JUV.					+					+	+				+		+				+					CHAMSTRI
CHONE DUNERI																										CHONDUNE
CIRRATULIDAE SPEC.																										CIRRATUL
CORBULA GIBBA		+					+	+	+	+			+	+	+		+		+	+	+	+	+			CORBGIBB
COROPHIUM INSIDIOSUM																										COROINSI
CORYSTES CASSIVELAUNUS						+																				CORYCASS
CUCUMARIA FRONDOSA	+	+																								CUCUFRON
CULTELLUS PELLUCIDUS	+	+		+	+										+				+			+				CULTPELL
CUMACEA SPEC													+													CUMACEA
CYLICHNA CILINDRACEA	+	+	+	+	+		+	+	+					+	+			+			+	+	+			CYLICILI
DEVONIA PERRIERI																										DEVOPERR
DIASTYLIS BRADYI	+	+	+		+	+	+		+			+	+	+	+		+						+			DIASBRAD
DIPLOCIRRUS GLAUCUS	+	+	+		+	+				+	+	+									+		+			DIPLGLAU

	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	
Species name	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	*Code*
DONAX VITTATUS																									DONAVITT
DOSINIA LUPINUS																									DOSILUPI
DOSINIA SPEC. JUV.																									DOSIJUVE
EBALIA CRANCHII							+																		EBALCRAN
EBALIA GRANULOSA																									EBALGRAN
ECHINOCARDIUM CORDATUM			+			+	+	+	+	+	+	+	+	+	+		+			+				+	ECHICORD
ECHINOCYAMUS PUSSILLUS										+															ECHIPUSS
EDWARDSIA CLAPAREDII														+	+							+			EDWACLAP
ENSIS AMERICANUS																									ENSIAMER
ENSIS ARCUATUS																									ENSIARCU
ENSIS ENSIS																									ENSIENSI
ENSIS SPEC.																									ENSISPEC
ETEONE FOLIOSA								+		+									+					+	ETEOFOLI
ETEONE LONGA																									ETEOLONG
EUDORELLA TRUNCATULA				+		+	+		+			+	+	+	+				+						EUDOTRUN
EUDORELLOPSIS DEFORMIS				+					+								+					+			EUDODEFO
EUMIDA SANGUINEA																									EUMISANG
EURIDYCE PULCHRA	+								+																EURIPULC
EUZONUS FLABELLIGERUS																									EUZOFLAB
EXOGONE HEBES																									EXOGHEBE
EXOGONE NAIDINA																									EXOGNAID
GARI FERVENSIS																									GARIFERV
GATTYANA CIRROSA							+							+											GATTCIRR
GLYCERA LAPIDUM																									GLYCLAPI
GLYCERA ROUXI													+												GLYCROUX
GLYCERA SPEC. JUV.			+	+			+																		GLYCJUVE
GLYCINDE NORDMANNI											+										+				GLYCNORD
GOLFINGIA ELONGATA																			+						GOLFELON
GOLFINGIA PROCERA			+																+						GOLFPROC
GOLFINGIA VULGARIS	+						+	+						+				+	+						GOLFVULG
GONIADA MACULATA	+	+	+	+	+	+				+	+	+		+					+		+		+	+	GONIMACU
GYPTIS CAPENSIS						+		+				+	+			+		+							GYPTCAPE
HARMOTHOE GLABRA																									HARMGLAB
HARMOTHOE LONGISETIS	+	+						+	+																HARMLONG
HARMOTHOE LUNULATA																								+	HARMLUNU
HARMOTHOE SPEC. JUV.				+				+															+		HARMJUVE
HARPINIA ANTENNARIA	+	+		+	+		+	+	+	+		+	+	+	+	+	+	+	+		+	+			HARPANTE
HIPPOMEDON DENTICULATUS				+																	+		+		HIPPDENT
HYALA VITREA		+	+					+				+	+		+	+			+						HYALVITR
IONE THORACICA			+	+				+		+			+		+										IONETHOR
IPHINOE TRISPINOSA											+	+								+					IPHITRIS
LANICE CONCHILEGA						+																			LANICONC
LANICE JUV.																									LANIJUVE
LEMBOS LONGIPES							+												+				+		LEMBLONG
LEPTON SQUAMOSUM			+																						LEPTSQUA
LEUCOTHOE INCISA						+			+			+				+				+					LEUCINCI
LUCINOMA BOREALIS																									LUCIBORE
LUMBRINERIS FRAGILIS																									LUMBFRAG
LUMBRINERIS LATREILLI	+	+	+			+	+	+				+		+	+	+		+							LUMBLATR
LUMBRINERIS SPEC. JUV.																									LUMBJUVE
LUTRARIA LUTRARIA																									LUTRLUTR
LYSILLA LOVENI				+																					LYSILOVE
MACOMA BALTHICA																									MACOBALT
MAGELONA ALLENI									+	+	+												+		MAGEALLE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	*Code*
MAGELONA PAPILLICORNIS	+			+	+		+		+	+	+	+		+	+		+			+		+	+	+	MAGEPAPI
MEDIOMASTUS FRAGILIS			+		+							+	+	+				+							MEDIFRAG
MEGALUROPUS AGILIS																									MEGAAGIL
MONTACUTA FERRUGINOSA									+	+		+	+		+					+				+	MONTFERR
MYRIOCHELE HEERI			+	+								+							+			+			MYRIHEER
MYSELLA BIDENTATA	+	+	+	+	+		+	+	+					+	+		+		+	+	+	+	+		MYSEBIDE
MYSELLA DAWSONIA																			+						MYSEDAWS
MYSIA UNDATA																							+		MYSIUNDA
NATICA ALDERI	+	+	+		+	+	+	+	+	+	+	+	+	+		+		+		+				+	NATIALDE
NATICA CATENA																									NATICATE
NEBALIA BIPES															+										NEBABIPE
NEMERTINI	+	+	+	+			+	+		+	+	+	+			+		+		+	+	+	+	+	NEMERTIN
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 TURGIDA			+	+	+		+		+	+	+	+	+		+	+	+	+		+	+	+	+		NUCUTURG
OLIGOCHAETA																									OLIGOCHA
OPHELIA LIMACINA																									OPHELIMA
OPHELIIDAE SPEC.																									OPHESPEC
OPHELINA ACUMINATA																			+	+					OPHEACUM
OPHIODROMUS FLEXUOSUS					+	+				+		+				+		+	+	+					OPHIFLEX
OPHIURA ALBIDA			+								+					+		+		+					OPHIALBI
OPHIURA TEXTURATA																									OPHITEXT
OPHIURA SPEC. JUV.	+	+			+	+	+	+	+		+			+						+				+	OPHISPEC
ORBINIA SERTULATA			+																						ORBISERT
ORCHOMENE HUMILIS																									ORCHHUMI
ORCHOMENE NANA									+					+											ORCHNANA
OWENIA FUSIFORMIS	+					+						+				+		+		+					OWENFUSI
PARAONIS FULGENS		+					+																		PARAFULG
PARAONIS GRACILIS							+												+						PARAGRAC
PECTINARIA AURICOMA																									PECTAURI
PECTINARIA KORENI										+															PECTKORE
PERIOCULODES LONGIMANUS	+			+			+			+	+		+			+				+		+		+	PERILONG
PHOLOE MINUTA	+	+	+	+	+	+		+				+				+	+		+	+		+	+		PHOLMINU
PHORONIDA	+	+	+	+	+	+	+	+		+	+	+	+		+	+	+	+	+		+	+	+	+	PHORONID
PHYLLODOCE ROSEA																									PHYLROSE
PHYLLODOCIDAE SPEC.				+							+												+		PHYLSPEC
PODARKEOPSIS HELGOLANDICA																		+							PODAHELG
POECILOCHAETUS SERPENS							+				+					+		+						+	POECSERP
POLYDORA SPEC.			+					+											+						POLYDORA
PONTOCRATES ALTAMARINUS																	+								PONTALTA
PRIONOSPIO CIRRIFERA																									PRIOCIRR
PROCESSA PARVA																+									PROCPARV
PSEUDOCUMA LONGICORNIS																									PSEULONG
RHODINE LOVENI																									RHODLOVE
SCALIBREGMA INFLATUM				+																					SCALINFL
SCOLELEPIS BONNIERI																									SCOLBONN
SCOLELEPIS SPEC. JUV.																									SCOLJUVE
SCOLOPLOS ARMIGER				+	+						+									+	+	+	+	+	SCOLARME

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	*Code*
SCOPELOCHEIRUS HOPEI																									SCOPHOPE
SIGALION MATHILDAE										+	+									+			+		SIGAMATH
SIPUNCULIDA SPEC.														+				+							SIPUNCUL
SPHAERODORUM FLAVUM																									SPHAFLAV
SPIO FILICORNIS	+			+	+	+		+		+			+		+				+					+	SPIOFILI
SPIOPHANES BOMBYX	+	+		+	+	+		+	+	+	+	+	+	+		+	+		+	+		+	+	+	SPIOBOMB
SPIOPHANES KROEYERI																									SPIOKROE
SPISULA ELLIPTICA																									SPISELLI
SPISULA SOLIDA																									SPISSOLI
SPISULA SUBTRUNCATA																								+	SPISSUBT
SPISULA SPEC. JUV.		+																+	+						SPISJUVE
STHENELAIS LIMICOLA	+	+		+			+				+	+				+	+			+	+	+	+		STHELIMI
SYLLIDAE SPEC.																									SYLLIDAE
SYNCHELIDIUM MACULATUM																									SYNCMACU
SYNELMIS KLATTI		+		+			+						+		+				+		+				SYNEKLAT
TELLINA FABULA					+					+				+						+			+	+	TELLFABU
TELLINA PYGMEA																									TELLPYGM
TELLINA TENUIS																									TELLTENU
TEREBELLIDES STROEMI																									TERESTRO
THIA SCUTELLATA																									THIASCUT
THRACIA PHASEOLINA																							+	+	THRAPHAS
THYASIRA FLEXUOSA	+			+	+						+										+				THYAFLEX
TRAVISIA FORBESII																									TRAVFORB
TURBELLARIA SPEC.					+									+	+			+			+				TURBELLA
TURRITELLA COMMUNIS								+					+	+											TURRCOMM
UNCIOLA PLANIPES																									UNCIPLAN
UPOGEBIA DELTAURA			+					+										+	+						UPOGDELT
UPOGEBIA STELLATA																			+						UPOGSTEL
UROTHOE BREVICORNIS																									UROTBREV
UROTHOE ELEGANS		+								+															UROTELEG
UROTHOE POSEIDONIS																								+	UROTPOSE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
ABRA ALBA			+	+																							ABRAALBA
ABRA NITIDA																											ABRANITI
ABRA PRISMATICA		+																									ABRAPRIS
ACROCNIDA BRACHIATA								+																			ACROBRAC
AMPELISCA BREVICORNIS																											AMPEBREV
AMPELISCA TENUICORNIS																											AMPETENU
AMPHARETE ACUTIFRONS																											AMPHACUT
AMPHARETE FINMARCHICA																											AMPHFINM
AMPHIOXUS LANCEOLATUS																											AMPHLANC
AMPHIURA CHIAJEI					+																						AMPHCHIA
AMPHIURA FILIFORMIS	+																										AMPHFILI
AMPHIURA SPEC. JUV.					+																						AMPHJUVE
ANAITIDES GROENLANDICA																											ANAIGROE
ANAITIDES MUCOSA																											ANAIMUCO
ANAITIDES SPEC. JUV.																											ANAIJUVE
ANTHOZOA SPEC.				+																							ANTHOZOA
AONIDES PAUCIBRANCHIATA						+																					AONIPAUC
APHELOCHAETA MARIONI																											APHEMARI
APHERUSA SPEC.																											APHERUSA
APISTOBRANCHUS TULLBERGI																											APISTULL
ARCTICA ISLANDICA JUV.																											ARCTISLA
ARICIDEA MINUTA										+							+		+	+	+	+				+	ARICMINU
ARICIDEA SUECICA																											ARICSUEC
ASTROPECTEN IRREGULARIS																											ASTRIRRE
ATYLUS FALCATUS																					+						ATYLFALC
ATYLUS SWAMMERDAMI																											ATYLSWAM
BATHYPOREIA ELEGANS	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+		+		+	+				BATHELEG
BATHYPOREIA GUILLIAMSONIANA	+	+	+					+	+	+	+	+		+			+			+			+		+		BATHGUIL
BATHYPOREIA TENUIPES																											BATHTENU
BATHYPOREIA JUV.																											BATHSPEC
BRISSOPSIS LYRIFERA																											BRISLYRI
CALLIANASSA JUV.				+																							CALLJUVE
CALLIANASSA SUBTERRANEA																											CALLSUBT
CALLIANASSA TYRRHENA																											CALLTYRR
CAPITELLA CAPITATA		+				+																					CAPICAPI
CAPITELLIDAE SPEC.																											CAPISPEC
CAPRELLIDAE SPEC.																											CAPRELLI
CARCINUS MAENAS																											CARCMAEN
CERIANTHUS LLOYDII																											CERILLOY
CHAETOPTERUS VARIOPEDATUS																											CHAEVARI
CHAETOZONE SETOSA	+	+	+	+					+	+	+	+		+	+	+			+	+					+		CHAESETO
CHAMELEA STRIATULA JUV.																											CHAMSTRI
CHONE DUNERI																											CHONDUNE
CIRRATULIDAE SPEC.																											CIRRATUL
CORBULA GIBBA																											CORBGIBB
COROPHIUM INSIDIOSUM	+				+																						COROINSI
CORYSTES CASSIVELAUNUS							+																				CORYCASS
CUCUMARIA FRONDOSA																											CUCUFRON
CULTELLUS PELLUCIDUS																											CULTPELL
CUMACEA SPEC																											CUMACEA
CYLICHNA CILINDRACEA																											CYLICILI
DEVONIA PERRIERI																											DEVOPERR
DIASTYLIS BRADYI				+	+										+										+		DIASBRAD
DIPLOCIRRUS GLAUCUS			+																								DIPLGLAU

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
DONAX VITTATUS													+	+	+		+										DONAVITT
DOSINIA LUPINUS																											DOSILUPI
DOSINIA SPEC. JUV.																											DOSIJUVE
EBALIA CRANCHII																											EBALCRAN
EBALIA GRANULOSA																											EBALGRAN
ECHINOCARDIUM CORDATUM			+	+			+	+	+	+		+		+		+	+			+			+				ECHICORD
ECHINOCYAMUS PUSSILLUS	+					+			+																		ECHIPUSS
EDWARDSIA CLAPAREDII	+																										EDWACLAP
ENSIS AMERICANUS																+							+				ENSIAMER
ENSIS ARCUATUS																											ENSIARCU
ENSIS ENSIS																											ENSIENSI
ENSIS SPEC.																											ENSISPEC
ETEONE FOLIOSA										+				+				+									ETEOFOLI
ETEONE LONGA			+																	+							ETEOLONG
EUDORELLA TRUNCATULA																											EUDOTRUN
EUDORELLOPSIS DEFORMIS																											EUDODEFO
EUMIDA SANGUINEA			+																								EUMISANG
EURIDYCE PULCHRA																											EURIPULC
EUZONUS FLABELLIGERUS																											EUZOFLAB
EXOGONE HEBES																								+	+	+	EXOGHEBE
EXOGONE NAIDINA																											EXOGNAID
GARI FERVENSIS																											GARIFERV
GATTYANA CIRROSA																											GATTCIRR
GLYCERA LAPIDUM																											GLYCLAPI
GLYCERA ROUXI																											GLYCROUX
GLYCERA SPEC. JUV.																								+	+	+	GLYCJUVE
GLYCINDE NORDMANNI																											GLYCNORD
GOLFINGIA ELONGATA																											GOLFELON
GOLFINGIA PROCERA																											GOLFPROC
GOLFINGIA VULGARIS																											GOLFVULG
GONIADA MACULATA	+	+					+	+			+		+			+											GONIMACU
GYPTIS CAPENSIS			+	+	+			+																			GYPTCAPE
HARMOTHOE GLABRA																											HARMGLAB
HARMOTHOE LONGISETIS																											HARMLONG
HARMOTHOE LUNULATA			+																								HARMLUNU
HARMOTHOE SPEC. JUV.																											HARMJUVE
HARPINIA ANTENNARIA																											HARPANTE
HIPPOMEDON DENTICULATUS																											HIPPDENT
HYALA VITREA																											HYALVITR
IONE THORACICA																											IONETHOR
IPHINOE TRISPINOSA																											IPHITRIS
LANICE CONCHILEGA		+	+		+												+										LANICONC
LANICE JUV.						+															+						LANIJUVE
LEMBOS LONGIPES																											LEMBLONG
LEPTON SQUAMOSUM																											LEPTSQUA
LEUCOTHOE INCISA				+			+														+						LEUCINCI
LUCINOMA BOREALIS																											LUCIBORE
LUMBRINERIS FRAGILIS																											LUMBFRAG
LUMBRINERIS LATREILLI																											LUMBLATR
LUMBRINERIS SPEC. JUV.																					+						LUMBJUVE
LUTRARIA LUTRARIA																											LUTRLUTR
LYSILLA LOVENI																											LYSILOVE
MACOMA BALTHICA																											MACOBALT
MAGELONA ALLENI																											MAGEALLE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	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	*Code*
MAGELONA PAPILLICORNIS	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+		+		+			+				MAGEPAPI
MEDIOMASTUS FRAGILIS																										+	MEDIFRAG
MEGALUROPUS AGILIS						+	+	+		+		+		+	+	+		+	+		+		+			+	MEGAAGIL
MONTACUTA FERRUGINOSA		+	+	+			+	+	+		+	+		+		+	+	+									MONTFERR
MYRIOCHELE HEERI																											MYRIHEER
MYSELLA BIDENTATA																											MYSEBIDE
MYSELLA DAWSONIA																											MYSEDAWS
MYSIA UNDATA																											MYSIUNDA
NATICA ALDERI				+	+	+						+			+	+	+			+							NATIALDE
NATICA CATENA																											NATICATE
NEBALIA BIPES																											NEBABIPE
NEMERTINI	+	+		+	+	+		+		+		+			+		+	+			+	+	+				NEMERTIN
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 TURGIDA				+							+																NUCUTURG
OLIGOCHAETA																											OLIGOCHA
OPHELIA LIMACINA		+																								+	OPHELIMA
OPHELIIDAE SPEC.																											OPHESPEC
OPHELINA ACUMINATA																											OPHEACUM
OPHIODROMUS FLEXUOSUS																											OPHIFLEX
OPHIURA ALBIDA				+		+				+	+	+						+			+						OPHIALBI
OPHIURA TEXTURATA			+																								OPHITEXT
OPHIURA SPEC. JUV.	+				+																						OPHISPEC
ORBINIA SERTULATA																											ORBISERT
ORCHOMENE HUMILIS																											ORCHHUMI
ORCHOMENE NANA																											ORCHNANA
OWENIA FUSIFORMIS											+																OWENFUSI
PARAONIS FULGENS																+											PARAFULG
PARAONIS GRACILIS																											PARAGRAC
PECTINARIA AURICOMA																											PECTAURI
PECTINARIA KORENI																											PECTKORE
PERIOCULODES LONGIMANUS	+		+								+																PERILONG
PHOLOE MINUTA				+																							PHOLMINU
PHORONIDA										+													+		+	+	PHORONID
PHYLLODOCE ROSEA																											PHYLROSE
PHYLLODOCIDAE SPEC.																											PHYLSPEC
PODARKEOPSIS HELGOLANDICA																											PODAHELG
POECILOCHAETUS SERPENS	+	+		+																							POECSERP
POLYDORA SPEC.																											POLYDORA
PONTOCRATES ALTAMARINUS														+			+							+			PONTALTA
PRIONOSPIO CIRRIFERA																											PRIOCIRR
PROCESSA PARVA																				+							PROCPARV
PSEUDOCUMA LONGICORNIS								+			+			+	+	+	+	+	+	+	+					+	PSEULONG
RHODINE LOVENI																											RHODLOVE
SCALIBREGMA INFLATUM																											SCALINFL
SCOLELEPIS BONNIERI		+														+	+	+	+	+	+					+	SCOLBONN
SCOLELEPIS SPEC. JUV.																											SCOLJUVE
SCOLOPLOS ARMIGER		+		+	+				+	+	+	+	+	+		+			+	+		+	+	+			SCOLARME

Appendix-1 Biomonitoring 1999 (+ =presence)

											Offshore area																
	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	
Species name	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	*Code*
SCOPELOCHEIRUS HOPEI																											SCOPHOPE
SIGALION MATHILDAE					+																						SIGAMATH
SIPUNCULIDA SPEC.																											SIPUNCUL
SPHAERODORUM FLAVUM																											SPHAFLAV
SPIO FILICORNIS				+			+									+	+				+						SPIOFILI
SPIOPHANES BOMBYX	+			+	+	+	+			+	+	+		+				+					+		+		SPIOBOMB
SPIOPHANES KROEYERI																											SPIOKROE
SPISULA ELLIPTICA		+																									SPISELLI
SPISULA SOLIDA																									+		SPISSOLI
SPISULA SUBTRUNCATA																											SPISSUBT
SPISULA SPEC. JUV.			+								+																SPISJUVE
STHENELAIS LIMICOLA																											STHELIMI
SYLLIDAE SPEC.																					+						SYLLIDAE
SYNCHELIDIUM MACULATUM	+				+			+		+		+				+									+		SYNCMACU
SYNELMIS KLATTI																											SYNEKLAT
TELLINA FABULA	+	+	+	+	+			+	+		+		+	+	+												TELLFABU
TELLINA PYGMEA																					+						TELLPYGM
TELLINA TENUIS																											TELLTENU
TEREBELLIDES STROEMI																											TERESTRO
THIA SCUTELLATA							+			+																	THIASCUT
THRACIA PHASEOLINA			+																								THRAPHAS
THYASIRA FLEXUOSA																											THYAFLEX
TRAVISIA FORBESII																											TRAVFORB
TURBELLARIA SPEC.																											TURBELLA
TURRITELLA COMMUNIS																											TURRCOMM
UNCIOLA PLANIPES					+						+				+												UNCIPLAN
UPOGEBIA DELTAURA																											UPOGDELT
UPOGEBIA STELLATA																											UPOGSTEL
UROTHOE BREVICORNIS																											UROTBREV
UROTHOE ELEGANS																											UROTELEG
UROTHOE POSEIDONIS	+	+			+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		UROTPOSE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	27	28	29	30	31	32	33	34	35	36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*Code*
ABRA ALBA																+										ABRAALBA
ABRA NITIDA																										ABRANITI
ABRA PRISMATICA																										ABRAPRIS
ACROCNIDA BRACHIATA																										ACROBRAC
AMPELISCA BREVICORNIS																										AMPEBREV
AMPELISCA TENUICORNIS																										AMPETENU
AMPHARETE ACUTIFRONS																										AMPHACUT
AMPHARETE FINMARCHICA																										AMPHFINM
AMPHIOXUS LANCEOLATUS			+																							AMPHLANC
AMPHIURA CHIAJEI																										AMPHCHIA
AMPHIURA FILIFORMIS																										AMPHFILI
AMPHIURA SPEC. JUV.																										AMPHJUVE
ANAITIDES GROENLANDICA																+										ANAIGROE
ANAITIDES MUCOSA																										ANAIMUCO
ANAITIDES SPEC. JUV.																										ANAIJUVE
ANTHOZOA SPEC.															+											ANTHOZOA
AONIDES PAUCIBRANCHIATA																										AONIPAUC
APHELOCHAETA MARIONI											+															APHEMARI
APHERUSA SPEC.																										APHERUSA
APISTOBRANCHUS TULLBERGI																										APISTULL
ARCTICA ISLANDICA JUV.			+																							ARCTISLA
ARICIDEA MINUTA					+	+		+	+																	ARICMINU
ARICIDEA SUECICA																										ARICSUEC
ASTROPECTEN IRREGULARIS																										ASTRIRRE
ATYLUS FALCATUS										+		+						+								ATYLFALC
ATYLUS SWAMMERDAMI																									+	ATYLSWAM
BATHYPOREIA ELEGANS			+	+	+		+	+			+	+	+	+		+	+	+	+						+	BATHELEG
BATHYPOREIA GUILLIAMSONIANA			+	+	+			+		+		+					+	+	+							BATHGUIL
BATHYPOREIA TENUIPES																										BATHTENU
BATHYPOREIA JUV.												+						+								BATHSPEC
BRISSOPSIS LYRIFERA																										BRISLYRI
CALLIANASSA JUV.																										CALLJUVE
CALLIANASSA SUBTERRANEA																										CALLSUBT
CALLIANASSA TYRRHENA							+																			CALLTYRR
CAPITELLA CAPITATA							+				+	+		+		+	+			+				+	+	CAPICAPI
CAPITELLIDAE SPEC.																										CAPISPEC
CAPRELLIDAE SPEC.																										CAPRELLI
CARCINUS MAENAS																								+		CARCMAEN
CERIANTHUS LLOYDII																										CERILLOY
CHAETOPTERUS VARIOPEDATUS																										CHAEVARI
CHAETOZONE SETOSA					+		+	+												+						CHAESETO
CHAMELEA STRIATULA JUV.																										CHAMSTRI
CHONE DUNERI																										CHONDUNE
CIRRATULIDAE SPEC.																										CIRRATUL
CORBULA GIBBA																										CORBGIBB
COROPHIUM INSIDIOSUM																										COROINSI
CORYSTES CASSIVELAUNUS																										CORYCASS
CUCUMARIA FRONDOSA																										CUCUFRON
CULTELLUS PELLUCIDUS																										CULTPELL
CUMACEA SPEC																										CUMACEA
CYLICHNA CILINDRACEA																										CYLICILI
DEVONIA PERRIERI																										DEVOPERR
DIASTYLIS BRADYI										+		+						+							+	DIASBRAD
DIPLOCIRRUS GLAUCUS																										DIPLGLAU

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	27	28	29	30	31	32	33	34	35	36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*Code*
DONAX VITTATUS								+										+								DONAVITT
DOSINIA LUPINUS																										DOSILUPI
DOSINIA SPEC. JUV.																										DOSIJUVE
EBALIA CRANCHII																										EBALCRAN
EBALIA GRANULOSA																										EBALGRAN
ECHINOCARDIUM CORDATUM				+	+	+	+					+	+	+		+		+								ECHICORD
ECHINOCYAMUS PUSSILLUS			+																							ECHIPUSS
EDWARDSIA CLAPAREDII							+																			EDWACLAP
ENSIS AMERICANUS													+	+						+	+			+		ENSIAMER
ENSIS ARCUATUS	+																									ENSIARCU
ENSIS ENSIS																										ENSIENSI
ENSIS SPEC.																										ENSISPEC
ETEONE FOLIOSA									+																	ETEOFOLI
ETEONE LONGA																										ETEOLONG
EUDORELLA TRUNCATULA																										EUDOTRUN
EUDORELLOPSIS DEFORMIS																										EUDODEFO
EUMIDA SANGUINEA												+														EUMISANG
EURIDYCE PULCHRA																										EURIPULC
EUZONUS FLABELLIGERUS		+																								EUZOFLAB
EXOGONE HEBES							+																			EXOGHEBE
EXOGONE NAIDINA										+																EXOGNAID
GARI FERVENSIS																										GARIFERV
GATTYANA CIRROSA																										GATTCIRR
GLYCERA LAPIDUM									+																	GLYCLAPI
GLYCERA ROUXI																										GLYCROUX
GLYCERA SPEC. JUV.		+	+																							GLYCJUVE
GLYCINDE NORDMANNI																										GLYCNORD
GOLFINGIA ELONGATA																										GOLFELON
GOLFINGIA PROCERA																										GOLFPROC
GOLFINGIA VULGARIS																										GOLFVULG
GONIADA MACULATA				+	+			+																		GONIMACU
GYPTIS CAPENSIS																										GYPTCAPE
HARMOTHOE GLABRA																										HARMGLAB
HARMOTHOE LONGISETIS																										HARMLONG
HARMOTHOE LUNULATA														+	+	+			+	+						HARMLUNU
HARMOTHOE SPEC. JUV.				+			+																			HARMJUVE
HARPINIA ANTENNARIA																										HARPANTE
HIPPOMEDON DENTICULATUS																										HIPPDENT
HYALA VITREA																										HYALVITR
IONE THORACICA																										IONETHOR
IPHINOE TRISPINOSA				+																						IPHITRIS
LANICE CONCHILEGA					+		+				+	+		+				+	+	+				+	+	LANICONC
LANICE JUV.										+																LANIJUVE
LEMBOS LONGIPES																										LEMBLONG
LEPTON SQUAMOSUM																										LEPTSQUA
LEUCOTHOE INCISA				+			+																			LEUCINCI
LUCINOMA BOREALIS																										LUCIBORE
LUMBRINERIS FRAGILIS																										LUMBFRAG
LUMBRINERIS LATREILLI																										LUMBLATR
LUMBRINERIS SPEC. JUV.																										LUMBJUVE
LUTRARIA LUTRARIA				+																						LUTRLUTR
LYSILLA LOVENI																										LYSILOVE
MACOMA BALTHICA												+		+		+	+									MACOBALT
MAGELONA ALLENI																										MAGEALLE

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	27	28	29	30	31	32	33	34	35	36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*Code*
MAGELONA PAPILLICORNIS				+	+	+		+	+		+	+	+	+		+	+	+	+	+	+	+			+	MAGEPAPI
MEDIOMASTUS FRAGILIS																										MEDIFRAG
MEGALUROPUS AGILIS		+		+			+	+	+	+																MEGAAGIL
MONTACUTA FERRUGINOSA				+			+					+	+	+	+	+		+			+					MONTFERR
MYRIOCHELE HEERI																	+									MYRIHEER
MYSELLA BIDENTATA				+							+	+	+			+			+	+	+			+	+	MYSEBIDE
MYSELLA DAWSONIA																										MYSEDAWS
MYSIA UNDATA																										MYSIUNDA
NATICA ALDERI																					+	+				NATIALDE
NATICA CATENA																										NATICATE
NEBALIA BIPES																										NEBABIPE
NEMERTINI	+	+	+	+		+	+			+	+		+			+	+	+	+						+	NEMERTIN
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 TURGIDA																										NUCUTURG
OLIGOCHAETA							+																			OLIGOCHA
OPHELIA LIMACINA			+				+																			OPHELIMA
OPHELIIDAE SPEC.										+																OPHESPEC
OPHELINA ACUMINATA																										OPHEACUM
OPHIODROMUS FLEXUOSUS																										OPHIFLEX
OPHIURA ALBIDA											+										+			+		OPHIALBI
OPHIURA TEXTURATA																								+		OPHITEXT
OPHIURA SPEC. JUV.										+							+									OPHISPEC
ORBINIA SERTULATA																										ORBISERT
ORCHOMENE HUMILIS																										ORCHHUMI
ORCHOMENE NANA																										ORCHNANA
OWENIA FUSIFORMIS																										OWENFUSI
PARAONIS FULGENS			+					+																		PARAFULG
PARAONIS GRACILIS																										PARAGRAC
PECTINARIA AURICOMA																										PECTAURI
PECTINARIA KORENI																										PECTKORE
PERIOCULODES LONGIMANUS				+										+									+			PERILONG
PHOLOE MINUTA																										PHOLMINU
PHORONIDA					+																					PHORONID
PHYLLODOCE ROSEA																										PHYLROSE
PHYLLODOCIDAE SPEC.																										PHYLSPEC
PODARKEOPSIS HELGOLANDICA																										PODAHELG
POECILOCHAETUS SERPENS																										POECSERP
POLYDORA SPEC.													+													POLYDORA
PONTOCRATES ALTAMARINUS																				+						PONTALTA
PRIONOSPIO CIRRIFERA																										PRIOCIRR
PROCESSA PARVA																										PROCPARV
PSEUDOCUMA LONGICORNIS			+		+	+		+																		PSEULONG
RHODINE LOVENI																										RHODLOVE
SCALIBREGMA INFLATUM																										SCALINFL
SCOLELEPIS BONNIERI	+								+																	SCOLBONN
SCOLELEPIS SPEC. JUV.																										SCOLJUVE
SCOLOPLOS ARMIGER	+		+		+	+					+		+			+	+	+				+		+	+	SCOLARME

Appendix-1 Biomonitoring 1999 (+ =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	
Species name	27	28	29	30	31	32	33	34	35	36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*Code*
SCOPELOCHEIRUS HOPEI																										SCOPHOPE
SIGALION MATHILDAE																									+	SIGAMATH
SIPUNCULIDA SPEC.																										SIPUNCUL
SPHAERODORUM FLAVUM																										SPHAFLAV
SPIO FILICORNIS				+		+	+				+	+	+				+	+		+					+	SPIOFILI
SPIOPHANES BOMBYX	+				+			+	+			+	+			+	+	+		+	+	+			+	SPIOBOMB
SPIOPHANES KROEYERI																										SPIOKROE
SPISULA ELLIPTICA																										SPISELLI
SPISULA SOLIDA																										SPISSOLI
SPISULA SUBTRUNCATA														+	+	+				+						SPISSUBT
SPISULA SPEC. JUV.												+	+													SPISJUVE
STHENELAIS LIMICOLA																										STHELIMI
SYLLIDAE SPEC.																										SYLLIDAE
SYNCHELIDIUM MACULATUM				+	+								+													SYNCMACU
SYNELMIS KLATTI																										SYNEKLAT
TELLINA FABULA				+							+	+	+	+	+	+		+	+	+	+				+	TELLFABU
TELLINA PYGMEA		+								+																TELLPYGM
TELLINA TENUIS														+						+						TELLTENU
TEREBELLIDES STROEMI																										TERESTRO
THIA SCUTELLATA							+																			THIASCUT
THRACIA PHASEOLINA																										THRAPHAS
THYASIRA FLEXUOSA																										THYAFLEX
TRAVISIA FORBESII			+																							TRAVFORB
TURBELLARIA SPEC.																										TURBELLA
TURRITELLA COMMUNIS																										TURRCOMM
UNCIOLA PLANIPES						+																				UNCIPLAN
UPOGEBIA DELTAURA																										UPOGDELT
UPOGEBIA STELLATA																										UPOGSTEL
UROTHOE BREVICORNIS				+		+	+																			UROTBREV
UROTHOE ELEGANS																										UROTELEG
UROTHOE POSEIDONIS				+	+	+	+	+	+			+	+	+	+	+		+	+	+	+				+	UROTPOSE

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	0.013			12.8	0.013				
atylfalc	12.8	0.004					12.8	0.004		
batheleg	846.8	0.254	58.5	0.018	423.4	0.127	705.7	0.212	38.5	0.012
bathguil	269.4	0.081	29.3	0.009	77.0	0.023	128.3	0.038	25.7	0.008
bathtenu									12.8	0.004
caprelli									12.8	0.004
coroinsi							25.7	0.008		
corycass	12.8	0.112							12.8	0.004
diasbrad					12.8	0.004				
ebalgran							12.8	0.004		
harpante	12.8	0.004								
hippdent							12.8	0.004		
iphitris	12.8	0.004					25.7	0.008	38.5	0.012
leucinci	12.8	0.004			25.7	0.008	64.2	0.019	12.8	0.004
orchhumi	12.8	0.004								
perilong	25.7	0.008								
pseulong							25.7	0.008		
scophope					25.7	0.008				
syncmacu	25.7	0.008			25.7	0.008	25.7	0.008	12.8	0.004
urotpose	654.3	0.196	29.3	0.009	628.7	0.189	77.0	0.023		
Echinodermata										
acrobrac			117.0	1.823	77.0	3.322	25.7	0.614	89.8	6.189
amphchia	218.1	0.717	248.7	0.138	166.8	1.863	154.0	0.035	64.2	0.021
amphfili	51.3	0.599	102.4	0.472						
echicord			14.6	11.103					12.8	9.737
ophispec									25.7	0.003
Mollusca										
arctisla	12.8	0.001			25.7	0.001	12.8	0.001	12.8	0.003
corbgibb							38.5	0.006		
cultpell			29.3	0.551			12.8	0.119	25.7	0.160
cylicili			14.6	0.014	12.8	0.009				
dosijuve			14.6	0.001						
dosilupi	12.8	0.031			25.7	0.029				
ensispec									12.8	0.019
gariferv							12.8	0.260	12.8	0.702
lucibore					12.8	0.902				
montferr			73.2	0.073			12.8	0.015		
mysebide	89.8	0.026	160.9	0.054	500.4	0.086	51.3	0.010	25.7	0.009
natialde	25.7	0.047	14.6	0.195	38.5	0.049			12.8	0.047
naticate					12.8	0.817				
spisjuve			14.6	0.002						
tellfabu	102.6	0.176	117.0	0.412	25.7	0.004	179.6	0.339	166.8	0.496
thraphas	12.8	0.037	14.6	0.017	25.7	0.028				
Polychaeta										
anaijuve									12.8	0.002
anaimuco					64.2	0.032				
apistull	12.8	0.010								
chaeseto	38.5	0.032			192.5	0.098	102.6	0.063	12.8	0.012
chondune	12.8	0.069								
eteolong									12.8	0.012
eumisang					12.8	0.007				
glycjuve									12.8	0.012
gonimacu	64.2	0.125	73.2	0.168	38.5	0.076	25.7	0.051	12.8	0.081
gyptcape					12.8	0.007				
harmjuve	12.8	0.010					12.8	0.008		
harmglab			14.6	0.015						
harmlunu									38.5	0.034
laniconc	25.7	0.635	43.9	1.651	38.5	4.141			25.7	0.640
magealle	25.7	0.129	43.9	0.220						
magepapi	230.9	0.195	336.5	1.529	295.1	0.151	603.0	0.373	372.1	0.320
nephcirr	102.6	0.483	58.5	0.278	64.2	0.032	25.7	0.122	25.7	0.022

nephhomb	25.7	0.122	14.6	0.070	25.7	0.014	25.7	0.122	64.2	0.056
nerelong	12.8	8.370								
notolate			29.3	0.585			77.0	3.909	12.8	0.677
ophelima	12.8	0.010								
owenfusi	12.8	0.010			77.0	0.943				
pholminu	38.5	0.032	43.9	0.014	25.7	0.007			12.8	0.007
phylrose							77.0	0.047		
poecserp	12.8	0.010								
scalinfl			14.6	0.064					12.8	0.012
scolbonn			14.6	0.075			25.7	0.015		
sigamath	25.7	0.086	29.3	1.002	77.0	2.540	64.2	2.117	25.7	0.847
spiofili					12.8	0.010	38.5	0.024		
spiobomb	166.8	0.141	292.6	0.324	487.5	0.251	423.4	0.263	474.7	0.447
Miscellaneous taxa										
amphlanc					12.8	0.135	12.8	0.135		
edwaclap	51.3	0.169	14.6	0.019			38.5	0.034		
nemertin	192.5	1.270	146.3	0.154	102.6	0.406	192.5	0.169	102.6	0.068
phoronid	12.8	0.085			12.8	0.051	166.8	0.102	12.8	0.008
sum	3528.3	14.319	2223.8	21.058	3707.9	16.389	3528.3	9.288	1873.2	20.692
diversity										
nspc	40.0		31.0		36.0		36.0		36.0	
SH-W	2.7		2.9		2.8		2.8		2.7	
Simp	0.1		0.1		0.1		0.1		0.1	

STATION:	DOG 6		DOG 7		OYS 1		OYS 2		OYS 3	
Crustacea	N	B	N	B	N	B	N	B	N	B
apherusa							12.8	0.004		
atylfalc	12.8	0.004	12.8	0.004						
batheleg	1154.7	0.346	769.8	0.231	14.6	0.004				
bathguil	179.6	0.054	230.9	0.069						
bathtenu	77.0	0.023	64.2	0.019						
calljuve							25.7	0.013	29.3	0.040
callsubt					14.6	3.024	51.3	0.739	14.6	1.933
coroinsi	12.8	0.004	64.2	0.019						
corycass					14.6	10.604				
diasbrad	12.8	0.004			14.6	0.004			14.6	0.004
ebalcran							12.8	0.064		
eudodefo					14.6	0.004				
eudotrun							25.7	0.008		
harpante					58.5	0.018	38.5	0.012	102.4	0.031
iphitris	12.8	0.004	51.3	0.015						
leucinci			12.8	0.004						
megaagil	25.7	0.008	12.8	0.004						
perilong	38.5	0.012								
pontalta			12.8	0.004						
syncmacu	51.3	0.015	25.7	0.008						
urotbrev							12.8	0.004		
urotpose	51.3	0.015	256.6	0.077						
Echinodermata										
acrobrac			12.8	0.506						
amphchia	77.0	0.080	269.4	0.834						
amphfili					497.4	2.052	38.5	0.071	1360.6	10.443
astrirre									14.6	0.015
echicord							12.8	6.142	14.6	4.503
echipuss			12.8	0.018						
ophispec			12.8	0.001			115.5	0.012		
Mollusca										
abraalba							12.8	0.001		
abraniti					29.3	0.010				
chamstri			12.8	0.003						
corbgibb			25.7	0.005			25.7	0.030	14.6	0.003
cultpell			12.8	0.158			12.8	0.204	29.3	1.025
cylicili			12.8	0.001	14.6	0.020			29.3	0.029

donavitt	38.5	0.035	38.5	0.037						
ensiensi	12.8	3.153	12.8	3.153						
hyalvitr					58.5	0.059				
montferr	12.8	0.002					64.2	0.063		
mysebide			38.5	0.013	102.4	0.006			87.8	0.017
mysiunda									14.6	1.208
natialde							12.8	0.064		
nucuturg					14.6	0.007	12.8	0.099	43.9	0.085
tellfabu	12.8	0.015	64.2	0.015						
thraphas			64.2	0.133					14.6	0.004
Polychaeta										
aricminu									14.6	0.012
capispec			12.8	0.010	14.6	0.009				
chaevari							12.8	2.036	14.6	1.501
chaeseto	25.7	0.025	25.7	0.019	29.3	0.081	12.8	0.003	43.9	0.033
diplglau									14.6	0.012
eteolong	25.7	0.046	25.7	0.012						
gattcirr							12.8	0.759		
glycjuve									14.6	0.012
glycnord					14.6	0.041				
gonimacu			38.5	0.029	14.6	0.041	25.7	0.008		
gyptcape			25.7	0.019			12.8	0.036		
harmjuve	12.8	0.022	12.8	0.010						
magepapi	192.5	0.339	615.8	0.457	14.6	0.041	166.8	0.054		
nephcirr	115.5	0.203	115.5	0.066						
nephhomb			25.7	1.250	14.6	0.807	38.5	0.093	29.3	0.684
nephjuve	64.2	0.112			14.6	0.041	25.7	0.008	14.6	0.012
notolate			64.2	3.260					14.6	0.491
ophelima	12.8	0.039								
ophiflex					29.3	0.280				
owenfusi	513.2	0.899	64.2	0.788						
pectauri									73.2	3.866
pectkore									14.6	0.077
pholminu			12.8	0.010	14.6	0.041			263.3	0.199
phylrose			38.5	0.029						
poecserp							12.8	0.003		
scalinfl							12.8	0.027		
scolarme									131.7	0.098
scolbonn	12.8	0.022								
scoljuve			12.8	0.010						
sphaflav									29.3	0.021
spiofili	12.8	0.022			14.6	0.041				
spiobomb	718.5	1.260	872.4	0.647			25.7	0.008	14.6	0.012
sthelimi									29.3	0.021
syneklat									29.3	0.021
Miscellaneous taxa										
edwaclap	12.8	0.022	38.5	0.025						
nemertin	51.3	0.015	64.2	0.041			77.0	0.085	43.9	0.029
phoronid	64.2	0.019	372.1	0.239	43.9	0.126	77.0	0.085	58.5	0.046
turbella							12.8	0.017		
sum	3618.1	6.818	4541.8	12.250	1068.0	17.359	1013.6	10.753	2633.4	26.486
diversity										
nspc	30.0		42.0		23.0		30.0		32.0	
SH-W	2.3		2.8		2.2		3.0		2.1	
Simp	0.2		0.1		0.2		0.1		0.3	

STATION:	OYS 4		OYS 5		OYS 6		OYS 7		OYS 8	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu	14.6	0.004					14.6	0.004	12.8	0.004
batheleg					12.8	0.004			12.8	0.004
bathguil					12.8	0.004				
calljuve					12.8	0.015	43.9	0.026	25.7	0.008
callsubt									102.6	1.690

diasbrad							14.6	0.004		
eudotrun							29.3	0.009		
eudodefo					25.7	0.008	14.6	0.004		
harpante			146.3	0.044	179.6	0.054	14.6	0.004		
ionethor					12.8	0.013				
iphitris	14.6	0.004								
leucinci	14.6	0.004								
syncmacu			14.6	0.004						
upogstel							14.6	0.129	64.2	5.185
urotpose					12.8	0.004				
Echinodermata										
acrobrac	14.6	1.174								
amphfili	14.6	0.005	1024.1	3.563	769.8	12.518	760.8	0.848	25.7	0.269
echicord	14.6	10.328	102.4	7.891						
ophispec	14.6	0.001	175.6	0.061	12.8	0.005	14.6	0.001	102.6	0.008
Mollusca										
abraalba			14.6	0.390	12.8	0.003			179.6	1.820
abraniti					12.8	0.078	58.5	0.053		
arctisla							14.6	0.003		
chamstri	14.6	0.011					14.6	0.000	12.8	0.023
corbgibb			263.3	0.060			14.6	0.005		
cultpell					25.7	0.002				
cylicili			14.6	0.004	38.5	0.027	43.9	0.044		
hyalvitr			14.6	0.015						
leptsqua							190.2	0.007		
montferr	14.6	0.045	29.3	0.043						
mysebide	14.6	0.003	29.3	0.004	461.9	0.088			51.3	0.005
natialde			14.6	0.064			14.6	0.038		
nucuturg					25.7	0.026	14.6	0.005	115.5	0.669
tellfabu	14.6	0.297								
thraphas	29.3	0.110							38.5	0.010
thyaflex	73.2	0.265			25.7	0.098				
turrcomm									12.8	0.000
Polychaeta										
amphacut							14.6	0.015		
chaevari			29.3	5.855						
chaeseto					25.7	0.032	29.3	0.033		
diplglau			43.9	0.093	12.8	0.030	29.3	0.066		
gattcirr			29.3	0.664						
glycjuve			14.6	0.031			14.6	0.015		
glycnord			14.6	0.120			29.3	0.156	12.8	0.112
gonimacu	102.4	0.083	14.6	0.031	51.3	0.095			25.7	0.022
gyptcape	14.6	0.006	43.9	0.093					25.7	0.022
harmjuve	29.3	0.014								
lumbjuve									12.8	0.010
lumblatr			29.3	0.062						
magepapi	1389.9	0.620	29.3	0.062	25.7	0.030	43.9	0.048		
medifrag									12.8	0.010
myriheer							29.3	0.033		
nephcirr							14.6	0.116		
nephhomb					51.3	2.029	43.9	0.292		
nephjuve			14.6	0.019	12.8	0.015				
nerelong			14.6	0.367			14.6	0.015	12.8	0.010
notolate	131.7	0.915	43.9	0.093			14.6	0.616	12.8	0.010
opheacum			29.3	0.214						
ophiflex					12.8	0.015	14.6	0.033	12.8	0.010
paragrac	14.6	0.006					43.9	0.048		
pectkore			14.6	0.687					12.8	0.174
pholminu	14.6	0.006	43.9	0.062	205.3	0.063	29.3	0.033	51.3	0.019
phylrose									12.8	0.010
priocirr							14.6	0.015		
rhodlove							14.6	0.015		
scolarme					128.3	0.159				

sphaflav					25.7	0.010				
spiofili	14.6	0.006	43.9	0.062			14.6	0.015		
spiobomb	438.9	0.156			89.8	0.110			25.7	0.022
sthelimi			14.6	0.031	12.8	0.015				
syneklat					12.8	0.015				
terestro			14.6	0.031			29.3	0.066		
Miscellaneous taxa										
amphlanc					25.7	0.010	14.6	0.012		
edwaclap					12.8	0.005	14.6	0.010		
golfelon			29.3	0.010					12.8	0.007
nemertin	160.9	0.068	73.2	0.023			14.6	0.010	230.9	0.122
oligocha									25.7	0.022
phoronid	131.7	0.058	43.9	0.015	25.7	0.010	73.2	0.048	269.4	0.142
turbella							14.6	0.010	12.8	0.007
sum	2706.6	14.187	2472.5	20.767	2386.4	15.594	1858.0	2.906	1539.6	10.425
diversity										
nspc	24.0		33.0		32.0		40.0		30.0	
SH-W	1.8		2.4		2.4		2.7		2.8	
Simp	0.3		0.2		0.2		0.2		0.1	

STATION:	OYS 9		OYS 10		OYS 11		OYS 12		OYS 13	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu							14.6	0.004		
apherusa							14.6	0.004		
batheleg	89.8	0.027							25.7	0.008
calljuve	64.2	0.117					29.3	0.037		
callsubt	25.7	0.375	25.7	0.115	160.9	6.129	73.2	4.404		
diasbrad					14.6	0.004				
eudotrun					14.6	0.004	14.6	0.004	12.8	0.004
eudodefo									38.5	0.012
harpante	51.3	0.015	51.3	0.015	14.6	0.004	87.8	0.026	25.7	0.008
perilong					14.6	0.004				
upogdelt					43.9	6.333				
uroteleg	12.8	0.004								
urotpose	12.8	0.004								
Echinodermata										
amphfili	51.3	0.103	872.4	7.458	863.2	7.417	29.3	0.208	744.1	7.316
brislyri			51.3	33.701						
echicord					58.5	4.270			12.8	3.949
ophialbi					29.3	0.438				
ophispec					204.8	0.047				
Mollusca										
abraalba			25.7	0.001	804.7	5.486	29.3	0.001	25.7	0.002
abraniti			12.8	0.011						
arctisla			25.7	0.002						
chamstri			12.8	0.001					51.3	0.012
corbgibb			12.8	0.002	29.3	0.175				
cultpell	12.8	0.001	12.8	0.094						
cylicili			128.3	0.156					64.2	0.069
hyalvitr					43.9	0.044	219.5	0.219		
leptsqua					14.6	0.001	29.3	0.001		
montferr			51.3	0.038					12.8	0.028
mysebide			115.5	0.024	58.5	0.010	14.6	0.001	307.9	0.075
mysiunda			12.8	0.210						
natialde	12.8	0.023			29.3	0.134	14.6	0.038		
nucuturg	12.8	0.010	25.7	0.009	58.5	0.181			12.8	0.055
thyaflex									12.8	0.011
Polychaeta										
amphfinm					29.3	0.068				
chaeseto	12.8	0.022	38.5	0.030					38.5	0.012
cirratul			12.8	0.063						
diplglau	12.8	0.025								
eteofoli	12.8	0.022	12.8	0.500						

eumisang					14.6	0.006				
glycroux							14.6	4.044		
gonimacu					29.3	0.012	14.6	0.006	12.8	0.003
harmlong					43.9	0.017				
lumbfrag							14.6	0.006		
lumblatr							14.6	0.006		
magealle			12.8	0.063						
magepapi	269.4	0.471								
medifrag			12.8	0.063						
myriheer					351.1	0.048	14.6	0.002		
nephcirr									25.7	0.459
nephhomb	25.7	1.487	12.8	1.404					12.8	0.169
nephjuve			12.8	0.063	14.6	0.006	14.6	0.006	12.8	0.003
nerelong					14.6	0.062	14.6	0.006		
notolate			38.5	3.179			29.3	0.286		
parafulg					29.3	0.012	29.3	0.012		
pholminu			141.1	0.056	43.9	0.017			89.8	0.036
phylspec									25.7	0.008
scolarme			12.8	0.063						
sigamath	12.8	0.205								
spiofili							73.2	0.029		
spiobomb	12.8	0.022	12.8	0.063					192.5	0.059
sthelimi									25.7	0.102
syneklat					14.6	0.006	58.5	0.023		
Miscellaneous taxa										
amphlanc					14.6	0.006			12.8	0.119
cerilloy							14.6	6.720		
edwaclap					14.6	0.006	14.6	0.012		
golfelon					29.3	0.058				
nemertin	166.8	0.064			73.2	0.029			25.7	0.229
phoronid	12.8	0.007	25.7	0.010	614.5	0.243	43.9	0.035	38.5	0.025
sipuncul			12.8	0.034			14.6	0.012		
turbella					14.6	0.006	14.6	0.012		
sum	885.3	3.005	1796.2	47.427	3803.8	31.283	965.6	16.164	1860.4	12.772
diversity										
nspc	19.0		28.0		33.0		28.0		25.0	
SH-W	2.3		2.2		2.5		2.9		2.2	
Simp	0.1		0.3		0.1		0.1		0.2	

STATION:	OYS 14		OYS 15		OYS 16		OYS 17		OYS 18	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg							38.5	0.012	89.8	0.027
calljuve	12.8	0.037	51.3	0.121	25.7	0.037	25.7	0.012	51.3	0.112
callsubt	12.8	0.658	12.8	0.420						
diasbrad	12.8	0.004					12.8	0.004		
eudotrun	12.8	0.004	25.7	0.008	12.8	0.004				
eudodefo			12.8	0.004	25.7	0.008	51.3	0.015		
harpante	51.3	0.015	51.3	0.015	25.7	0.008	77.0	0.023	12.8	0.004
perilong									12.8	0.004
urotpose	12.8	0.004								
uroteleg							179.6	0.054	12.8	0.004
Echinodermata										
amphfili	38.5	0.029	128.3	0.112	1154.7	3.230	115.5	0.149	38.5	0.489
echicord					25.7	7.680				
ophispec					25.7	0.002			25.7	0.002
Mollusca										
abraalba			25.7	0.001	12.8	0.000				
arctisla			25.7	0.002						
chamstri			12.8	0.001						
corbgibb	282.3	0.113	38.5	0.009	936.6	0.274			25.7	0.005
cultpell					25.7	0.584				
cylicili	25.7	0.030	25.7	0.007	64.2	0.069				
devoperr			12.8	0.001						

dosilupi			12.8	0.024						
hyalvitr					12.8	0.013				
montferr			12.8	0.009	38.5	0.048				
mysebide	12.8	0.001			115.5	0.021	12.8	0.001		
natialde	25.7	0.156			25.7	0.037			38.5	0.089
nucuturg	25.7	0.032			128.3	0.282	12.8	0.024		
spisjuve			12.8	0.016						
thyaflex					12.8	0.002				
Polychaeta										
amphfinm					12.8	0.053				
chaevari			25.7	6.009	64.2	12.090				
chaeseto	12.8	0.007	77.0	0.108	25.7	0.044	25.7	0.024	25.7	0.019
diplglau			25.7	0.036	25.7	0.044				
eteofoli	12.8	0.007								
eumisang	12.8	0.007								
gattcirr			25.7	1.208	77.0	2.744				
glycjuve					12.8	0.022				
glycnord			12.8	0.019						
gonimacu			25.7	0.036						
lumbjuve			12.8	0.019						
lumblatr	12.8	0.007			12.8	0.022				
magealle									38.5	0.264
magepapi					25.7	0.044	25.7	0.061	397.7	0.303
medifrag			12.8	0.019	25.7	0.044				
nephcirr									38.5	0.029
nephhomb	12.8	0.130	25.7	0.339	25.7	0.112				
nephinci	25.7	0.261	51.3	0.677	12.8	0.056	12.8	0.611		
nephjuve	12.8	0.025	12.8	0.044	25.7	0.054				
nerelong			12.8	0.019						
notolate	38.5	0.552	12.8	0.019	51.3	0.489				
ophiflex	12.8	0.083	12.8	0.049			25.7	0.088	12.8	0.010
owenfusi					25.7	0.247				
paragrac	12.8	0.007	12.8	0.019						
pectauri	12.8	0.103			12.8	0.022				
pholminu			12.8	0.019	89.8	0.024				
phylspec							12.8	0.030		
poecserp							25.7	0.061	12.8	0.010
priocirr							12.8	0.030		
scolbonn									12.8	0.010
scolarme									12.8	0.061
spiobomb	12.8	0.007			12.8	0.022			38.5	0.029
spiokroe			12.8	0.019						
sthelimi							12.8	0.064		
syneklat	12.8	0.007	12.8	0.019	38.5	0.056				
Miscellaneous taxa										
amphlanc					12.8	0.085				
edwaclap			12.8	0.008	12.8	0.005				
golfelon	12.8	0.325	12.8	0.423						
golfvulg			25.7	0.335						
nemertin	12.8	0.034			25.7	0.007	51.3	0.010	51.3	0.076
phoronid			12.8	0.008	51.3	0.014			89.8	0.135
sipuncul					25.7	0.012				
turbella			12.8	0.008	12.8	0.005				
sum	757.0	2.645	936.6	10.207	3387.1	28.613	731.3	1.274	1039.2	1.681
diversity										
nspc	27.0		38.0		41.0		18.0		20.0	
SH-W	2.6		3.4		2.4		2.5		2.4	
Simp	0.1		0.0		0.2		0.1		0.2	

STATION:	OYS 19		OYS 20		OYS 21		OYS 22		OYS 23	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev							14.6	0.015		
ampetenu	14.6	0.004								
apherusa			12.8	0.004						
batheleg			12.8	0.004			58.5	0.018	12.8	0.004
calljuve	73.2	0.217	38.5	0.054	128.3	0.816	29.3	0.255	12.8	0.002
callsubt			25.7	1.765	12.8	0.764	29.3	4.587		
diasbrad	14.6	0.004	12.8	0.004	25.7	0.008			12.8	0.004
eudotrun							14.6	0.004		
eudodefo							14.6	0.004		
euripulc	14.6	0.544								
harpante	14.6	0.004	51.3	0.015			43.9	0.013	64.2	0.019
hippdent							14.6	0.004		
ionethor					12.8	0.013	14.6	0.015		
perilong	14.6	0.004					29.3	0.009		
upogdelt					102.6	22.921				
uroteleg			12.8	0.004						
Echinodermata										
amphfili	1053.4	3.876	551.7	0.996	551.7	3.410	307.2	2.221	667.2	8.476
brislyri			12.8	4.139						
cucufron	14.6	1.151	12.8	0.751						
echicord					12.8	3.249				
ophialbi					25.7	0.352				
ophispec	14.6	0.001	25.7	0.003					25.7	0.002
Mollusca										
abraalba			38.5	0.216	64.2	0.819			12.8	0.000
arctisla			12.8	0.004					25.7	0.004
chamstri									12.8	0.003
corbgibb			25.7	0.005						
cultpell	14.6	0.002	12.8	0.001			29.3	0.002	12.8	0.244
cylicili	73.2	0.066	12.8	0.017	12.8	0.017	14.6	0.020	12.8	0.073
hyalvitr			12.8	0.013	12.8	0.013				
leptsqua					38.5	0.076				
mysebide	321.9	0.021	38.5	0.008	12.8	0.003	146.3	0.008	680.0	0.181
natialde	29.3	0.006	12.8	0.002	12.8	0.004			12.8	0.002
nucuturg					64.2	0.250	73.2	0.173	89.8	0.129
spisjuve			12.8	0.004						
tellfabu									64.2	0.061
thyaflex	14.6	0.009					14.6	0.017	77.0	0.141
Polychaeta										
chaeseto	14.6	0.014					29.3	0.025	12.8	0.008
diplglau	14.6	0.014	12.8	0.024	12.8	0.019			38.5	0.025
glycjuve					25.7	0.039	14.6	0.014		
gonimacu	14.6	0.014	25.7	0.046	12.8	0.019	14.6	0.014	51.3	0.034
harmjuve							14.6	0.014		
harmlong	14.6	0.014	38.5	0.069						
lumblatr	14.6	0.014	12.8	0.069	12.8	0.019				
lysilove							14.6	2.020		
magepapi	14.6	0.029					43.9	0.039	115.5	0.078
medifrag					51.3	0.076			12.8	0.008
myriheer					141.1	0.003	14.6	0.014		
nephinci					12.8	0.058				
nephhomb	29.3	0.326	25.7	0.098			14.6	0.077	25.7	0.254
nephjuve	29.3	0.027			12.8	0.019			12.8	0.008
nerelong					12.8	0.019				
notolate			38.5	2.669	25.7	0.058				
ophiflex									25.7	0.056
orbisert					12.8	2.954				
owenfusi	14.6	0.014								
parafulg			12.8	0.024						
pholminu	87.8	0.023	12.8	0.024	25.7	0.008	73.2	0.021	192.5	0.051
phylspec							14.6	0.014		

polydora					51.3	0.076				
scalinfl							14.6	0.014		
scolarme							14.6	0.014	12.8	0.008
spiofili	14.6	0.014					14.6	0.014	25.7	0.017
spiobomb	14.6	0.014	25.7	0.046			146.3	0.126	923.8	0.618
sthelimi	29.3	0.054	12.8	0.069			14.6	0.014		
syneklat			38.5	0.017	25.7	0.203	29.3	0.025		
Miscellaneous taxa										
amphlanc									12.8	0.051
golfvulg	29.3	1.178								
nemertin	43.9	0.015	25.7	0.015	77.0	0.020	14.6	0.010		
phoronid	43.9	0.017	25.7	0.017	795.5	0.220	29.3	0.031	25.7	0.019
turbella									12.8	0.010
sum	2106.7	7.688	1257.3	11.195	2399.2	36.524	1375.2	9.859	3297.3	10.591
diversity										
nspc	30.0		33.0		31.0		34.0		31.0	
SH-W	2.1		2.6		2.4		3.0		2.3	
Simp	0.3		0.2		0.2		0.1		0.2	

STATION:	OYS 24		OYS 25		OYS 26		OYS 27		OYS 28	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg	12.8	0.004					64.2	0.019	12.8	0.004
calljuve	102.6	0.541			43.9	0.307			12.8	0.023
callsubt	25.7	1.436			87.8	10.889			25.7	1.101
corycass	12.8	6.559								
diasbrad	12.8	0.004	12.8	0.004			25.7	0.008		
ebalcran			12.8	0.004						
eudotrun	38.5	0.012	12.8	0.004			25.7	0.008		
eudodefo							12.8	0.004		
euripulc							12.8	1.137		
harpante			128.3	0.038	14.6	0.004	12.8	0.004	102.6	0.031
ionethor					29.3	0.042			25.7	0.023
lemblong			89.8	0.027						
leucinci	51.3	0.015					38.5	0.012		
orchnana							12.8	0.004		
perilong			12.8	0.004					25.7	0.008
upogdelt					14.6	1.165				
uroteleg									25.7	0.008
Echinodermata										
amphchia			12.8	0.077						
amphfili			141.1	0.254	336.5	1.588				
echicord	25.7	0.267	12.8	2.500	14.6	2.274	12.8	3.249	12.8	2.639
echipuss									102.6	0.023
ophispec	25.7	0.008	12.8	0.001	87.8	0.018	51.3	0.008		
Mollusca										
abraalba					43.9	0.276			12.8	0.017
abraniti	51.3	0.050								
arctisla									64.2	0.008
chamstri									12.8	0.001
corbgibb			12.8	0.007	29.3	0.013	128.3	0.026	12.8	0.007
cylicili			12.8	0.017	29.3	0.029	12.8	0.006		
hyalvitr					365.8	0.366				
montferr							38.5	0.093	38.5	0.025
mysebide			77.0	0.005	43.9	0.004	25.7	0.003		
natialde	51.3	1.019	12.8	0.009	14.6	0.026	12.8	0.047	12.8	0.004
nucuturg			25.7	0.009			25.7	0.012	102.6	0.485
tellfabu									25.7	0.000
turrcomm					29.3	2.926				
Polychaeta										
aphemari			25.7	0.042						
chaevari			25.7	7.707						
chaeseto			12.8	0.022			12.8	0.008		
diplglau	12.8	0.025							25.7	0.015

eteofoli					14.6	0.010			12.8	0.008
gattcirr			25.7	0.581						
glycjuve			12.8	0.022						
gonimacu	25.7	0.032							12.8	0.059
gyptcape	12.8	0.025			29.3	0.019				
harmlong					14.6	0.010	12.8	0.008		
harmjuve					14.6	0.010				
laniconc	12.8	0.159								
lumblatr	25.7	0.051	12.8	0.022	14.6	0.060				
magealle							25.7	0.215	12.8	0.093
magepapi			12.8	0.022			115.5	0.083	577.4	0.357
nephhomb			25.7	0.857	14.6	0.527	25.7	0.584	12.8	1.673
nephinci			12.8	0.423						
nephjuve			12.8	0.034			25.7	0.019		
notolate	12.8	0.308	12.8	0.283	14.6	1.276				
ophiflex	12.8	0.044							25.7	0.034
owenfusi	12.8	0.025								
parafulg			12.8	0.022						
paragrac			12.8	0.022						
pectkore									12.8	0.290
pholminu	25.7	0.007			14.6	0.004				
poecserp			12.8	0.022						
polydora					43.9	0.029				
sigamath									25.7	0.119
spiofili	12.8	0.025			29.3	0.019			12.8	0.008
spiobomb	38.5	0.080			14.6	0.010	25.7	0.019	12.8	0.008
sthelimi			12.8	0.022						
syneklat			12.8	0.022						
Miscellaneous taxa										
golfvulg			12.8	0.544	14.6	1.292				
nemertin			12.8	0.008	14.6	0.004			51.3	0.017
phoronid	12.8	0.002	25.7	0.034	146.3	0.035			25.7	0.008
sum	628.7	10.698	898.1	13.670	1580.0	23.231	757.0	5.576	1449.8	7.097
diversity										
nspc	23.0		34.0		29.0		23.0		30.0	
SH-W	2.9		3.1		2.7		2.8		2.5	
Simp	0.0		0.1		0.1		0.1		0.2	

STATION:	OYS 29		OYS 30		OYS 31		OYS 32		OYS 33	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampebrev	14.6	0.004								
ampetenu					12.8	0.004			29.3	0.009
batheleg	14.6	0.004			12.8	0.004				
calljuve			115.5	0.448	154.0	0.527	38.5	0.137	29.3	0.033
callsubt			64.2	1.861	12.8	0.264			43.9	1.505
cumacea					12.8	0.004				
diasbrad			25.7	0.008	38.5	0.012	12.8	0.004	14.6	0.004
eudotrun			64.2	0.019	12.8	0.004	38.5	0.012	14.6	0.004
harpante			128.3	0.038	12.8	0.004	12.8	0.004	43.9	0.013
ionethor					25.7	0.023			14.6	0.020
iphitris	29.3	0.009	12.8	0.004						
leucinci			12.8	0.004						
nebabipe									14.6	0.004
orchnana							38.5	0.012		
perilong	29.3	0.009			12.8	0.004				
Echinodermata										
acrobrac	14.6	1.585								
amphfili			12.8	0.004	320.8	1.819	51.3	0.260	234.1	0.554
echicord	14.6	4.943	1270.2	11.908	38.5	19.726	25.7	0.315	14.6	9.955
ophialbi	14.6	0.019								
ophispec	175.6	0.011					102.6	0.025		
Mollusca										
abraalba	73.2	0.003	64.2	0.029			64.2	0.005		

abraniti	14.6	0.010	12.8	0.061	12.8	0.120				
arctisla					12.8	0.003			14.6	0.003
chamstri	14.6	0.027							43.9	0.008
corbgibb					25.7	0.044	2001.5	0.539	29.3	0.008
cultpell									14.6	0.002
cylicili							25.7	0.035	14.6	0.010
hyalvitr			12.8	0.013	12.8	0.013			87.8	0.088
montferr			25.7	0.036	77.0	0.122			43.9	0.027
mysebide							12.8	0.001	14.6	0.001
natialde	29.3	0.150	38.5	0.006	12.8	0.004	12.8	0.034		
nucuturg	14.6	0.086	89.8	0.285	64.2	0.612			14.6	0.011
tellfabu							12.8	0.000		
thyaflex	87.8	0.085								
turrcomm					12.8	1.283	12.8	1.283		
Polychaeta										
aphemari					12.8	0.010			29.3	0.017
aricsuec					12.8	0.003				
chaevari							192.5	40.385		
chaeseto			25.7	0.029			12.8	0.010		
diplglau	14.6	0.014	25.7	0.029						
gattcirr							115.5	1.033		
glycroux					12.8	0.075				
glycnord	14.6	0.014								
gonimacu	73.2	0.066	12.8	0.015			12.8	0.010		
gyptcape			12.8	0.015	25.7	0.022				
lumblatr			51.3	0.163			25.7	0.020	14.6	0.010
magealle	87.8	0.417								
magepapi	526.7	0.465	12.8	0.015			25.7	0.020	29.3	0.017
medifrag			64.2	0.073	12.8	0.010	25.7	0.020		
myriheer			12.8	0.002						
nephhomb	58.5	0.481	38.5	0.159	12.8	0.010	12.8	0.068	29.3	0.166
nephjuve			12.8	0.015			12.8	0.015	14.6	0.039
nephlong							12.8	0.423		
nerelong							12.8	0.010		
notolate	234.1	4.287			25.7	1.226	38.5	0.705	14.6	0.010
ophiflex			12.8	0.015						
owenfusi			64.2	0.073						
pholminu			77.0	0.020						
phylspec	14.6	0.014								
poecserp	14.6	0.014								
scolarme	29.3	0.025								
sigamath	14.6	0.014								
spiofili					51.3	0.042			29.3	0.017
spiobomb	321.9	0.284	102.6	0.117	12.8	0.010	12.8	0.010		
sthelimi	14.6	0.014	25.7	0.029						
syneklat					12.8	0.010			14.6	0.010
Miscellaneous taxa										
amphlanc							12.8	0.005		
edwaclap							12.8	0.008	14.6	1.773
golfvulg							12.8	0.217		
nemertin	117.0	0.023	77.0	0.017	12.8	0.003				
phoronid	73.2	0.035	38.5	0.034	12.8	0.008			73.2	0.145
sipuncul							38.5	0.015		
turbella							25.7	0.008	14.6	0.010
sum	2150.6	13.111	2617.3	15.545	1116.2	26.027	3079.2	45.649	1009.5	14.472
diversity										
nspc	29.0		32.0		32.0		33.0		30.0	
SH-W	2.6		2.3		2.8		1.7		3.0	
Simp	0.1		0.2		0.1		0.4		0.1	

STATION:	OYS 34		OYS 35		OYS 36		OYS 37		OYS 38	
Crustacea	N	B	N	B	N	B	N	B	N	B
ampetenu							29.3	0.009		
batheleg			64.2	0.019					12.8	0.004
bathtenu	12.8	0.004	12.8	0.004	12.8	0.004				
calljuve			12.8	0.010	269.4	2.542	73.2	1.031	25.7	0.231
callsubt	64.2	2.144			25.7	1.980	14.6	1.293		
diasbrad			12.8	0.004						
eudotrun			12.8	0.004			43.9	0.013		
harpante	12.8	0.004	25.7	0.008	12.8	0.004	14.6	0.004		
iphitris									12.8	0.004
lemblong							14.6	0.004		
leucinci	12.8	0.004							25.7	0.008
perilong	12.8	0.004							12.8	0.004
pontalta			12.8	0.004						
procparv	12.8	0.375								
upogdelt					25.7	9.228	29.3	18.164		
upogstel							29.3	0.913		
Echinodermata										
amphfili	12.8	0.051	166.8	0.472	12.8	0.051	58.5	0.075		
echicord			12.8	3.949					1360.0	14.153
ophialbi	25.7	0.502			77.0	1.083			12.8	0.114
ophispec									12.8	0.001
Mollusca										
abraalba	141.1	0.280			64.2	0.394			38.5	0.007
abraniti	12.8	0.047					14.6	0.029	295.1	0.698
arctisla							14.6	0.005		
chamstri			12.8	0.003						
corbgibb			12.8	0.007			87.8	0.028	12.8	0.007
cultpell							14.6	0.001		
cylicili					12.8	0.049				
hyalvitr	12.8	0.013					43.9	0.044		
montferr									51.3	0.072
mysebide			25.7	0.001			29.3	0.002	25.7	0.008
mysedaws							29.3	0.003		
natialde	102.6	0.058			64.2	0.048			12.8	0.004
nucuturg	12.8	0.046	12.8	0.004	38.5	0.109			38.5	0.038
spisjuve					12.8	0.004	14.6	0.014		
tellfabu									51.3	0.001
Polychaeta										
aphemari							29.3	0.017		
chaeseto									25.7	0.019
eteofoli							29.3	0.017		
gonimacu							14.6	0.010		
gyptcape	64.2	0.073			25.7	0.059				
lumblatr	12.8	0.003			51.3	0.119				
magepapi			166.8	0.064					89.8	0.066
medifrag					77.0	0.178				
myriheer							14.6	0.002		
nephhomb									12.8	0.042
nephinci	12.8	0.086			12.8	0.030	14.6	0.377		
nephjuve									12.8	0.008
nerelong	12.8	0.025			12.8	0.234				
notolate	179.6	0.354			154.0	0.356	43.9	0.334		
opheacum							14.6	0.158	12.8	0.010
ophiflex	38.5	0.069			12.8	0.037	43.9	0.209	12.8	0.010
owenfusi	12.8	0.025			12.8	0.616			12.8	0.010
paragrac							43.9	0.027		
pholminu	12.8	0.003	12.8	0.005			14.6	0.004	25.7	0.019
podahelg					12.8	0.030				
poecserp	38.5	0.076			12.8	0.030				
polydora							175.6	0.108		
scolarme									12.8	0.010

sigamath									12.8	0.083
spiofili							29.3	0.017		
spiobomb	25.7	0.051	12.8	0.005			14.6	0.010	25.7	0.019
sthelimi	25.7	0.051	12.8	0.049					25.7	0.108
syneklat							29.3	0.017		
Miscellaneous taxa										
amphlanc	25.7	0.854								
cerilloy							14.6	6.189		
golfelon							117.0	3.042		
golfproc							14.6	0.407		
golfvulg					12.8	2.019	58.5	1.543		
nemertin	77.0	0.019			51.3	0.014			12.8	0.008
phoronid	256.6	0.235	38.5	0.034	51.3	0.036	73.2	0.039		
sipuncul					12.8	0.015				
turbella					12.8	0.002				
sum	1244.5	5.457	641.5	4.645	1154.7	19.272	1346.0	34.160	2296.6	15.766
diversity										
nspc	27.0		18.0		27.0		36.0		29.0	
SH-W	2.7		2.3		2.8		3.3		1.8	
Simp	0.1		0.1		0.1		0.0		0.4	

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	12.8	0.004			12.8	0.004				
batheleg	12.8	0.004	12.8	0.004	25.7	0.008	179.6	0.054	166.8	0.050
bathguil							154.0	0.046	77.0	0.023
calljuve	25.7	0.038								
coroinsi									25.7	0.008
diasbrad					12.8	0.004				
eudodefo			77.0	0.023						
harpante	77.0	0.023	64.2	0.019						
hippdent	12.8	0.004			25.7	0.008				
lemblong					12.8	0.004				
perilong			25.7	0.008			12.8	0.004	38.5	0.012
syncmacu									12.8	0.004
urotpose							77.0	0.023	25.7	0.008
Echinodermata										
acrobrac					12.8	0.875				
amphchia					12.8	0.019				
amphfili	590.2	1.062	397.7	2.449	230.9	0.348			12.8	0.150
astrirre	12.8	0.006								
echicord							12.8	15.034		
echipuss									77.0	0.013
ophispec							25.7	0.003	12.8	0.001
Mollusca										
abraalba	25.7	0.001			12.8	0.000				
abraniti	12.8	0.047								
arctisla	12.8	0.001					25.7	0.002		
chamstri	12.8	0.001								
corbgibb	12.8	0.002	51.3	0.009	25.7	0.005				
cultpell			12.8	0.102						
cylicili	51.3	0.026	12.8	0.006	12.8	0.017				
montferr							128.3	0.092		
mysebide	51.3	0.010	89.8	0.008	25.7	0.007				
mysiunda					25.7	0.211				
natialde							64.2	0.082		
nucuturg	25.7	0.247	12.8	0.158	77.0	0.388				
spissubt							25.7	0.218		
tellfabu					38.5	0.075	128.3	0.230	64.2	0.354
thraphas					12.8	0.025	64.2	0.051		
thyaflex	38.5	0.006								

Polychaeta										
aphemari	64.2	0.037								
chaeseto	256.6	0.152	25.7	0.010	38.5	0.025	115.5	0.113	154.0	0.127
diplglau	12.8	0.007			25.7	0.017				
eteofoli							12.8	0.012		
glycnord	12.8	0.032								
gonimacu	12.8	0.007			102.6	0.068	12.8	0.024	25.7	0.020
harmjuve					12.8	0.008				
harmlunu							12.8	0.154		
magealle					38.5	0.058				
magepapi			89.8	0.036	667.2	0.444	359.2	0.352	141.1	0.117
myriheer			12.8	0.005						
nephcaec							12.8	0.506		
nephhomb	12.8	0.132	38.5	1.771	25.7	0.125				
nephjuve	38.5	0.017			38.5	0.025	38.5	0.037		
notolate					25.7	0.017				
pholminu			192.5	0.078	77.0	0.051				
phylspec					12.8	0.008				
poecserp							12.8	0.012	12.8	0.010
scolarme	12.8	0.007	166.8	0.068	12.8	0.141	25.7	0.025		
sigamath					12.8	0.149				
spiofili							12.8	0.012		
spiobomb			25.7	0.010	1026.4	0.683	102.6	0.100	12.8	0.154
sthelimi	12.8	0.027	25.7	0.075	25.7	0.069				
syneklat	12.8	0.007								
Miscellaneous taxa										
edwaclap			12.8	0.034					25.7	0.017
nemertin	12.8	0.017	38.5	0.017	77.0	0.012	89.8	0.008	51.3	0.034
phoronid	102.6	0.102	218.1	0.203	25.7	0.034	25.7	0.019		
turbella	12.8	0.008								
sum	1578.1	2.039	1603.8	5.093	2822.6	3.930	1732.1	17.215	936.6	1.100
diversity										
nspc	30.0		21.0		33.0		25.0		17.0	
SH-W	2.4		2.5		2.3		2.7		2.5	
Simp	0.2		0.1		0.2		0.1		0.1	

STATION:	OFF-2		OFF-3		OFF-4		OFF-5		OFF-6	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg	117.0	0.035	204.8	0.061	89.8	0.027	77.0	0.023	25.7	0.008
bathguil	43.9	0.013	160.9	0.048						
calljuve					12.8	0.038				
coroinsi							12.8	0.004		
diasbrad					12.8	0.004	12.8	0.004		
leucinci					12.8	0.004				
megaagil									12.8	0.004
perilong			14.6	0.004						
syncmacu							12.8	0.004		
unciplan							12.8	0.004		
urotpose	14.6	0.004					218.1	0.065		
Echinodermata										
amphchia							25.7	0.151		
echicord			14.6	0.119	12.8	1.375				
echipuss									25.7	0.083
ophialbi					12.8	0.026			12.8	0.010
ophispec							25.7	0.001		
ophitext			14.6	2.293						
Mollusca										
abraalba			14.6	0.662	12.8	0.143				
abrapris	14.6	0.099								
montferr	43.9	0.014	14.6	0.010	38.5	0.021				
natialde					12.8	0.085	12.8	0.047	12.8	0.002
nucuturg					38.5	0.528				
spiselli	14.6	0.392								

spisjuve			14.6	0.003						
tellfabu	190.2	2.491	175.6	2.647	38.5	0.265	77.0	0.522		
thraphas			14.6	0.022						
Polychaeta										
aonipauc									12.8	0.019
capicapi	29.3	0.041							12.8	0.019
chaeseto	29.3	0.041	248.7	0.713	12.8	0.010				
diplglau			14.6	0.021						
eteolong			14.6	0.042						
eumisang			14.6	0.042						
gonimacu	14.6	0.021								
gyptcape			14.6	0.042	12.8	0.010	12.8	0.008		
harmlunu			14.6	0.085						
laniconc	29.3	1.275	43.9	3.824			38.5	0.024		
lanijuve									25.7	0.037
magepapi	3906.2	5.515	380.4	1.091	667.2	0.413	256.6	0.156		
nephcaec							51.3	0.574		
nephcirr	14.6	0.021							77.0	0.285
nephhomb	14.6	0.021								
nephinci					12.8	1.744				
nephjuve			14.6	0.021	12.8	0.010	12.8	0.008	51.3	0.075
notolate					51.3	2.710	89.8	3.556		
ophelima	14.6	0.021								
pholminu					12.8	0.010				
poecserp	14.6	0.021			12.8	0.010				
scolbonn	73.2	0.102								
scolarme	87.8	0.124			12.8	0.015	77.0	0.047		
sigamath							64.2	0.234		
spiofili					12.8	0.010				
spiobomb					12.8	0.144	102.6	0.063	12.8	0.019
Miscellaneous taxa										
anthozoa					12.8	3.766				
nemertin	131.7	0.029	43.9	0.029	64.2	0.015	77.0	0.017	25.7	0.008
sum	4798.6	10.280	1448.4	11.781	1206.0	11.385	1270.2	5.513	307.9	0.567
diversity										
nspc	19.0		20.0		24.0		20.0		12.0	
SH-W	0.9		2.2		2.0		2.6		2.3	
Simp	0.7		0.1		0.3		0.1		0.1	

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	872.4	0.262	141.1	0.042	230.9	0.069	154.0	0.046
bathguil			141.1	0.042	38.5	0.012	51.3	0.015	25.7	0.008
corycass	12.8	14.534								
leucinci	12.8	0.004								
megaagil	12.8	0.004	12.8	0.004			12.8	0.004		
perilong									12.8	0.004
pseulong			12.8	0.004					12.8	0.004
syncmacu			12.8	0.004			25.7	0.008		
thiascut	12.8	0.395					12.8	0.764		
unciplan									25.7	0.008
urotpose	782.6	0.235	846.8	0.254	141.1	0.042	192.5	0.058	12.8	0.004
Echinodermata										
acrobrac			12.8	1.599						
echicord	102.6	40.693	12.8	0.037	12.8	11.986	25.7	24.873		
echipuss					12.8	0.042				
ophialbi							12.8	0.404	25.7	0.141
Mollusca										
montferr	12.8	0.001	25.7	0.067	38.5	0.042			12.8	0.002
nucuturg									12.8	0.010
spisjuve									12.8	0.009
tellfabu			115.5	2.970	12.8	0.232			25.7	0.015

Polychaeta										
aricminu							38.5	0.019		
chaeseto					12.8	0.036	25.7	0.029	51.3	0.019
eteofoli							12.8	0.014		
gonimacu	12.8	0.012	12.8	0.146					25.7	0.152
gyptcape			12.8	0.007						
magepapi	102.6	0.093	115.5	0.049	51.3	0.146	12.8	0.014	256.6	0.097
nephcirr	12.8	0.105	12.8	0.154	25.7	0.203	12.8	0.110	12.8	0.005
nephjuve	12.8	0.012			25.7	0.073			12.8	0.005
owenfusi									12.8	0.005
scolarme					51.3	0.081	25.7	0.078	12.8	0.005
spiofili	12.8	0.012								
spiobomb	12.8	0.152					12.8	0.066	38.5	0.015
Miscellaneous taxa										
nemertin			51.3	0.010			12.8	0.008		
sum	1129.0	56.255	2270.9	5.609	564.5	12.935	718.5	26.531	757.0	0.553
diversity										
nspc	14.0		15.0		12.0		16.0		19.0	
SH-W	1.2		1.6		2.1		2.1		2.3	
Simp	0.5		0.3		0.1		0.2		0.2	

STATION:	OFF-12		OFF-13		OFF-14		OFF-15		OFF-16	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg	51.3	0.015			64.2	0.019	12.8	0.004	12.8	0.004
bathguil	12.8	0.004			51.3	0.015				
diasbrad							77.0	0.023		
megaagil	12.8	0.004			12.8	0.004	25.7	0.008	12.8	0.004
pontalta					25.7	0.008				
pseulong					25.7	0.008	51.3	0.015	12.8	0.004
syncmacu	12.8	0.004							12.8	0.004
unciplan							38.5	0.012		
urotpose	64.2	0.019	12.8	0.004	12.8	0.004	77.0	0.023	141.1	0.042
Echinodermata										
echicord	25.7	8.850			192.5	10.665			12.8	14.114
ophialbi	12.8	0.005								
Mollusca										
donavitt			12.8	0.023	12.8	0.004	12.8	0.006		
ensiamer									12.8	7.922
montferr	25.7	0.008			25.7	0.005			12.8	0.011
natialde	12.8	0.002					12.8	0.001	25.7	0.081
tellfabu			12.8	0.002	12.8	0.002	12.8	0.003		
Polychaeta										
chaeseto	12.8	0.015			25.7	0.027	12.8	0.022	12.8	0.010
eteofoli					12.8	0.014				
gonimacu			51.3	0.203					12.8	0.051
magepapi	12.8	0.051	25.7	0.051	51.3	0.091	64.2	0.195	12.8	0.010
nephcirr	77.0	0.093	38.5	0.076	51.3	0.054	12.8	0.022	51.3	0.244
nephjuve	25.7	0.030	12.8	0.017					12.8	0.010
parafulg									77.0	0.064
scolbonn									12.8	0.010
scolarme	64.2	0.122	12.8	0.025	38.5	0.041			12.8	0.059
spiofili									12.8	0.010
spiobomb	12.8	0.015			12.8	0.014				
Miscellaneous taxa										
nemertin	12.8	0.005					12.8	0.005		
sum	449.1	9.244	179.6	0.401	628.7	10.974	423.4	0.338	474.7	22.655
diversity										
nspc	16.0		8.0		16.0		13.0		18.0	
SH-W	2.5		1.9		2.4		2.3		2.4	
Simp	0.1		0.1		0.1		0.1		0.1	

STATION:	OFF-17		OFF-18		OFF-19		OFF-20		OFF-21	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc									12.8	0.004
batheleg	12.8	0.004	51.3	0.015			12.8	0.004		
bathguil	12.8	0.004					12.8	0.004		
leucinci									12.8	0.004
megaagil			51.3	0.015	25.7	0.008			25.7	0.008
pontalta	25.7	0.008								
procparv							12.8	0.194		
pseulong	12.8	0.004	38.5	0.012	89.8	0.027	12.8	0.004	51.3	0.015
urotpose	154.0	0.046	179.6	0.054	25.7	0.008	25.7	0.008	12.8	0.004
Echinodermata										
echicord	25.7	19.826					12.8	13.669		
ophialbi			12.8	0.017					12.8	0.532
Mollusca										
donavitt	12.8	1.701								
montferr	12.8	0.028	102.6	0.020						
natialde	12.8	0.015					12.8	0.015		
tellpygm									243.8	0.108
Polychaeta										
aricminu	38.5	0.019			141.1	0.298	38.5	0.090	12.8	0.015
chaeseto					12.8	0.054	12.8	0.030		
eteofoli			12.8	0.024						
eteolong							12.8	0.030		
laniconc	12.8	0.007								
lanijuve									12.8	0.015
lumbjuve									25.7	0.030
magepapi			12.8	0.071			12.8	0.030		
nephcaec							12.8	0.178	12.8	0.224
nephcirr	51.3	0.337	38.5	0.921	51.3	0.186	141.1	0.120	12.8	0.015
nephhomb	25.7	0.169								
nephjuve			12.8	0.024	12.8	0.027			25.7	0.030
scolbonn	12.8	0.088	89.8	1.026	12.8	0.027	12.8	0.061	12.8	0.046
scolarme					12.8	0.081	12.8	0.030		
spiofili	12.8	0.007							12.8	0.015
spiobomb			12.8	0.024						
syllidae									51.3	0.061
Miscellaneous taxa										
nemertin	12.8	0.020	12.8	0.007					25.7	0.008
sum	449.1	22.282	628.7	2.230	384.9	0.716	359.2	14.468	577.4	1.135
diversity										
nspc	16.0		13.0		9.0		15.0		17.0	
SH-W	2.3		2.2		1.8		2.2		2.2	
Simp	0.1		0.1		0.2		0.2		0.2	

STATION:	OFF-22		OFF-23		OFF-24		OFF-25		OFF-26	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg	12.8	0.004	89.8	0.027						
bathguil			38.5	0.012			12.8	0.004		
diasbrad							51.3	0.015		
megaagil			51.3	0.015					25.7	0.008
pontalta					12.8	0.004				
pseulong									38.5	0.012
syncmacu							12.8	0.004		
urotpose	64.2	0.019	551.7	0.166			25.7	0.008		
Echinodermata										
echicord			38.5	22.881						
Mollusca										
ensiamer			12.8	7.202						
spissoli							12.8	1.683		
Polychaeta										
aricminu	12.8	0.019							12.8	0.010
chaeseto							12.8	0.005		

exoghebe							12.8	0.005	12.8	0.010
glycjuve					38.5	0.015	25.7	0.012	25.7	0.029
magepapi			12.8	0.010						
medifrag									12.8	0.014
nephcaec	12.8	0.019					25.7	0.012	12.8	0.572
nephcirr	77.0	0.837	38.5	0.030	25.7	0.068	38.5	0.207		
nephjuve	12.8	0.019							25.7	0.029
ophelima									12.8	0.017
scolbonn									12.8	0.017
scolarme	25.7	0.037	38.5	0.240	12.8	0.051				
spiobomb			25.7	0.020			38.5	0.017		
Miscellaneous taxa										
nemertin	38.5	0.019	64.2	0.007						
phoronid			12.8	0.010			51.3	0.022	64.2	0.003
sum	256.6	0.971	975.1	30.621	89.8	0.138	320.8	1.993	256.6	0.720
diversity										
nspc	8.0		12.0		4.0		12.0		11.0	
SH-W	1.8		1.7		1.3		2.3		2.2	
Simp	0.2		0.3		0.2		0.1		0.1	

STATION:	OFF-27		OFF-28		OFF-29		OFF-30		OFF-31	
Crustacea	N	B	N	B	N	B	N	B	N	B
batheleg					102.6	0.031	205.3	0.062	89.8	0.027
bathguil					166.8	0.050	51.3	0.015	12.8	0.004
iphitris							12.8	0.004		
leucinci							12.8	0.004		
megaagil			12.8	0.004			12.8	0.004		
perilong							12.8	0.004		
pseulong					12.8	0.004			12.8	0.004
syncmacu							12.8	0.004	12.8	0.004
urotbrev							102.6	0.031		
urotpose							205.3	0.062	25.7	0.008
Echinodermata										
echicord							25.7	19.474	12.8	2.639
echipuss					269.4	0.406				
Mollusca										
arctisla					25.7	0.002				
ensiarcu	51.3	33.523								
lutrlutr							12.8	2.592		
montferr							38.5	0.015		
mysebide							51.3	0.009		
tellfabu							141.1	2.218		
tellpygm			12.8	0.002						
Polychaeta										
aricminu									25.7	0.030
chaeseto									12.8	0.015
euzoflab			25.7	0.007						
gonimacu							12.8	0.242	12.8	0.071
glycjuve			25.7	0.007	12.8	0.014				
harmjuve							12.8	0.015		
laniconc									12.8	0.015
magepapi							38.5	0.049	77.0	0.244
nephcaec			12.8	0.254						
nephcirr			51.3	1.038			38.5	1.406	12.8	0.015
nephhomb							25.7	0.937		
nephjuve			25.7	0.017	25.7	0.025				
nerelong							12.8	0.225		
notolate							12.8	2.022		
ophelima					38.5	0.327				
parafulg					102.6	0.102				
scolbonn	12.8	0.039								
scolarme	38.5	0.115			25.7	0.025			25.7	0.030
spiofili							12.8	0.015		

spiobomb	141.1	0.423							12.8	0.015
travforb					38.5	0.611				
Miscellaneous taxa										
amphlanc					12.8	0.135				
nemertin	12.8	0.039	12.8	0.015	12.8	0.017	12.8	0.003		
phoronid									12.8	0.010
sum	256.6	34.139	179.6	1.344	846.8	1.750	1077.7	29.410	372.1	3.132
diversity										
nspc	5.0		8.0		13.0		23.0		15.0	
SH-W	1.2		1.9		2.0		2.6		2.4	
Simp	0.3		0.1		0.2		0.1		0.1	

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
batheleg			141.1	0.042	218.1	0.065				
bathguil					25.7	0.008			12.8	0.004
calltyrr			25.7	4.948						
diasbrad									12.8	0.004
leucinci			64.2	0.019						
megaagil			12.8	0.004	12.8	0.004	25.7	0.008	64.2	0.019
pseulong	89.8	0.027			38.5	0.012				
thiascut			25.7	0.060						
unciplan	12.8	0.004								
urotbrev	12.8	0.004	77.0	0.023						
urotpose	25.7	0.008	282.3	0.085	205.3	0.062	12.8	0.004		
Echinodermata										
echicord	12.8	4.335	38.5	24.859						
ophispec									89.8	0.011
Mollusca										
donavitt					12.8	0.069				
montferr			12.8	0.004						
tellpygm									38.5	0.044
Polychaeta										
aricminu	115.5	0.054			25.7	0.025	25.7	0.027		
capicapi			89.8	0.034						
chaeseto			12.8	0.005	12.8	0.014				
eteofoli							12.8	0.014		
exoghebe			12.8	0.005						
exognaid									12.8	0.008
glyclapi							12.8	0.063		
gonimacu					12.8	0.049				
harmjuve			12.8	0.005						
laniconc			38.5	0.713						
lanijuve									25.7	0.017
magepapi	38.5	0.019			38.5	0.085	12.8	0.135		
nephcaec			12.8	0.235						
nephcirr	12.8	0.135	38.5	0.703	25.7	0.200	25.7	0.196	25.7	0.307
nephhomb			25.7	0.469						
nephjuve	12.8	0.007	89.8	0.068	77.0	0.068	38.5	0.039	51.3	0.034
ophelima			12.8	0.063						
ophespec									51.3	0.034
parafulg					25.7	0.025				
scolbonn							51.3	0.622		
scolarme	38.5	0.195								
spiofili	12.8	0.007	12.8	0.005						
spiobomb					12.8	0.014	38.5	0.039		
Miscellaneous taxa										
edwaclap			12.8	0.014						
nemertin	38.5	0.017	38.5	0.008					12.8	0.008
oligocha			12.8	0.005						

sum	423.4	4.811	1103.4	32.376	744.1	0.698	256.6	1.146	410.6	0.494
diversity										
nspc	12.0		23.0		14.0		10.0		12.0	
SH-W	2.1		2.6		2.1		2.2		2.3	
Simp	0.1		0.1		0.2		0.1		0.1	
STATION:	COA 1		COA 2		COA 3		COA 4		COA 5	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc			14.6	0.004						
batheleg	102.4	0.031	219.5	0.066	25.7	0.008	12.8	0.004		
bathguil			87.8	0.026						
bathspec			29.3	0.009						
diasbrad			29.3	0.009						
perilong							51.3	0.015		
syncmacu					25.7	0.008				
urotpose			482.8	0.145	872.4	0.262	89.8	0.027	577.4	0.173
Echinodermata										
echicord			14.6	5.912	12.8	13.669	25.7	7.898		
ophialbi	14.6	0.460								
Mollusca										
ensiamer					12.8	26.555	12.8	0.710		
macobalt			219.5	3.354			12.8	0.507		
montferr			599.8	0.442	25.7	0.030	230.9	0.087	12.8	0.006
mysebide	175.6	0.029	14.6	0.003	89.8	0.026				
spisjuve			29.3	0.004	12.8	0.002	25.7	1.174		
spissubt									1911.7	129.474
tellfabu	204.8	3.105	102.4	0.002	205.3	2.720	89.8	1.025	38.5	0.061
telltenu							25.7	1.241		
Polychaeta										
aphemari	58.5	0.042								
capicapi	29.3	0.021	43.9	0.052			12.8	0.015		
eumisang			29.3	0.035						
harmlunu							38.5	0.102	12.8	0.112
laniconc	175.6	0.127	43.9	0.052			12.8	1.197		
magepapi	263.3	0.189	1199.7	1.400	77.0	0.134	12.8	0.015		
nephcaec	14.6	1.276			64.2	0.552	38.5	0.632		
nephcirr					25.7	0.222	12.8	0.015		
nephhomb					64.2	0.552	77.0	1.265		
nephjuve	14.6	0.010			12.8	0.022			12.8	0.008
nerelong	29.3	0.021								
polydora					12.8	0.022				
scolarme	526.7	0.380			12.8	0.022				
spiofili	14.6	0.010	131.7	0.154	397.7	0.694				
spiobomb			14.6	0.017	307.9	0.539				
Miscellaneous taxa										
anthozoa									12.8	0.181
nemertin	204.8	0.068			12.8	0.010				
sum	1828.8	5.771	3306.4	11.686	2270.9	46.048	782.6	15.931	2578.8	130.02
diversity										
nspc	14.0		18.0		19.0		17.0		7.0	
SH-W	2.1		2.0		2.0		2.4		0.7	
Simp	0.1		0.2		0.2		0.1		0.6	
STATION:	COA 6		COA 7		COA 8		COA 9		COA 10	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylfalc					14.6	0.004				
batheleg	219.5	0.066	1068.0	0.320	219.5	0.066	25.7	0.008		
bathguil			73.2	0.022	102.4	0.031	51.3	0.015		
bathspec					43.9	0.013				
diasbrad					14.6	0.004				
pontalta									12.8	0.004
urotpose	43.9	0.013			614.5	0.184	346.4	0.104	128.3	0.038

Echinodermata										
echicord	87.8	24.624			14.6	8.228				
ophispec			14.6	0.003						
Mollusca										
abraalba	14.6	0.300								
donavitt					43.9	0.030				
ensiamer									102.6	77.914
macobalt	541.3	12.070	43.9	0.215						
montferr	146.3	0.111			160.9	0.105				
mysebide	175.6	0.059					25.7	0.015	38.5	0.012
spissubt	29.3	0.080							89.8	5.820
tellfabu	102.4	0.105			73.2	0.005	51.3	1.045	89.8	0.061
telltenu									12.8	0.663
Polychaeta										
anaigroe	29.3	0.377								
capicapi	87.8	0.087	14.6	0.027					25.7	0.081
chaeseto									12.8	0.075
harmlunu	14.6	0.143					12.8	0.047	12.8	0.093
laniconc					29.3	0.033	51.3	2.037	25.7	1.531
magepapi	1214.3	3.824	1711.7	3.165	204.8	0.465	128.3	0.479	12.8	0.020
myriheer			14.6	0.027						
nephcirr					29.3	0.295	25.7	0.144	25.7	0.144
nephhomb	14.6	0.046	102.4	0.975	14.6	0.149	51.3	0.288	25.7	0.142
nephjuve							12.8	0.047	25.7	0.149
nerelong	14.6	0.046								
scolarme	716.9	2.315	14.6	0.672	14.6	0.274				
spiofili			29.3	0.058	14.6	0.017			77.0	0.220
spiobomb	14.6	0.029	102.4	0.189	102.4	0.116			25.7	0.149
Miscellaneous taxa										
nemertin	14.6	0.010	14.6	0.015	43.9	0.097	38.5	0.014		
sum	3481.9	44.305	3204.0	5.690	1755.6	10.118	821.1	4.244	744.1	87.117
diversity										
nspc	18.0		12.0		18.0		12.0		17.0	
SH-W	2.0		1.2		2.2		1.9		2.5	
Simp	0.2		0.4		0.2		0.2		0.1	

STATION:	COA 11		COA 12		COA 13		COA 14		COA 15	
Crustacea	N	B	N	B	N	B	N	B	N	B
atylswam									12.8	0.004
batheleg									51.3	0.015
carcmaen							25.7	1.842		
diasbrad									12.8	0.004
perilong					77.0	0.023				
urotpose	38.5	0.012							333.6	0.100
Echinodermata										
ophialbi	12.8	0.142					115.5	1.283		
ophitext							25.7	0.137		
Mollusca										
ensiamer	51.3	25.253					38.5	55.925		
montferr	77.0	0.033								
mysebide	38.5	0.016					166.8	0.061	192.5	0.023
natialde	12.8	0.109	12.8	0.064						
tellfabu	38.5	0.697							77.0	0.750
Polychaeta										
capicapi							269.4	0.193	89.8	0.139
laniconc							12.8	0.161	12.8	0.019
magepapi	12.8	0.037	51.3	0.391					333.6	0.517
nephcaec			38.5	0.295			12.8	0.047		
nephcirr	51.3	0.572	38.5	0.293			89.8	0.271	64.2	3.048
nephhomb									64.2	3.048
nephjuve			12.8	0.049						
nerelong							12.8	0.965		
notolate									12.8	1.162

scolarme			25.7	0.196			64.2	0.046	38.5	0.059
sigamath									51.3	0.452
spiofili									25.7	0.039
spiobomb	38.5	0.112	12.8	0.049					218.1	0.337
Miscellaneous taxa										
nemertin									12.8	1.712
sum	372.1	26.982	192.5	1.338	77.0	0.023	834.0	60.931	1603.8	11.429
diversity										
nspc	10.0		7.0		1.0		11.0		17.0	
SH-W	2.2		1.8		0.0		1.9		2.3	
Simp	0.1		0.1		1.0		0.2		0.1	

CONTENTS