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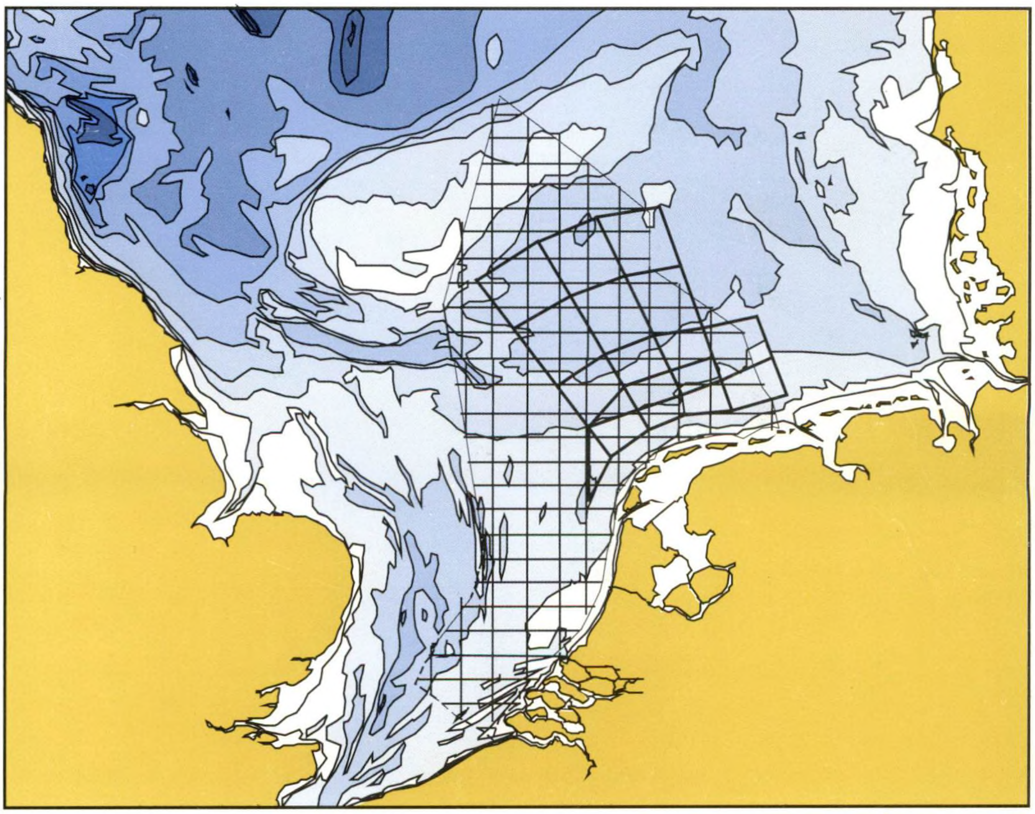

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DISTRIBUTION OF THE ZOOBENTHOS ON THE DUTCH CONTINENTAL SHELF: THE OYSTER GROUND, FRISIAN FRONT, VLIELAND GROUND AND TERSCHELLING BANK (1991)

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NETHERLANDS INSTITUTE FOR SEA RESEARCH
Department of Benthic Systems

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SUMMARY

In spring 1991, the MILZON-BENTHOS II project was carried out to investigate the area between the Vlieland Ground/Terschelling Bank and the Oyster Ground in order to study the zoobenthos of the Dutch part of the Continental Shelf. The aim of the project was to examine the spatial distribution of the zoobenthos, to get more information about possible zonations of the meio- and macrobenthos and the relationship between these benthos groups and various abiotic factors. In the study area depth increases from 25 m in the south to 50 m in the Oyster Ground. Between the 30 to 40 m isobaths there is a bottom zone, enriched with mud, chlorophyll-a and POC, known as the Frisian Front area.

In total, 78 bottom samples have been collected with a Reineck boxcorer in order to analyze the meiobenthos, the macrobenthos and selected sediment parameters. Additional data from another 7 stations located in the study area, which were sampled during the EXP*BMN program 1991 (Duineveld, 1992; Huys & De Smet, 1992), have been incorporated in the dataset.

In the 85 meiobenthos samples studied, 14 permanent taxa were found. The density ranged between a maximum of 9592 ind./10 cm^2 and a minimum of 417 ind./10 cm^2 with an average value of 2773 ind./10 cm^2. The most important taxon of the meiobenthos is that of the Nematoda, accounting for 94 % of the total density.

In total, 190 macrobenthic species were identified in 85 sorted samples. The number of species fluctuated between 9 and 35 per sample. Macrofaunal density ranged from 322 to 22135 ind./m^2 with a mean of 3154 ind./m^2. The biomass varied between 1 and 111 g AFDW/m^2 with a mean of 18 g AFDW/m^2. Over the whole area, the Polychaeta were dominant both in terms of density as well as of biomass (52 and 30 %, respectively).

Application of the TWINSPAN-cluster analysis (Hill, 1979) on the 1991 study area, based on taxon-level of the meiobenthic density, respectively on species-level of the macrobenthic density, shows in general a similar distribution and resulted in the following 4 major clusters (Table 6 and 11):

cluster 1. The Frisian Front area and the central part of the Oyster Ground. Muddy fine sand with high chlorophyll-a and POC content.
- very high total meiobenthic density (3719.8 ind./10 cm^2) as well as Nematoda density (3608.5 ind./10 cm^2) and a low diversity.
- the highest average biomass of macrobenthos (23.6 g AFDW/m^2) and a high diversity.

cluster 2. The eastern and western part of the Oyster Ground, together with the southern part of the study area (meiobenthos) and the northern part of the Oyster Ground (macrobenthos).
- intermediate meiobenthic density (2280.7 ind./10 cm^2) and a low diversity.
- the highest average number of macrobenthic species (27.32 per sample).

cluster 3. The southern part of the Frisian Front.
- appearance of the interstitial meiobenthos taxa in higher densities, whereas the diversity was somewhat higher than in the first two clusters.
- the highest average density of macrobenthos (4528.2 ind./m^2), with a low diversity.

cluster 4. The southeastern and southwestern part of the study area, with coarse sand.
- all taxa, except Nematoda, Kinorhyncha and Priapulida were present in relatively high densities; the diversity was relatively high.
- the lowest average values for macrobenthic density (965.6 ind./m^2), biomass (5.2 g AFDW/m^2) and number of species (15.67 per sample).

SAMENVATTING

In het voorjaar van 1991 werd in het kader van het MILZON-BENTHOS II project het gebied tussen de Vlieland Gronden/Terschellinger Bank en de Oester Gronden onderzocht, om het zoöbenthos in het Nederlandse deel van het Continentale Plat te bestuderen. Het doel van het project was om de ruimtelijke verspreiding van het zoöbenthos in kaart te brengen en om meer informatie te verkrijgen over mogelijke zoneringen van het meio- en macrobenthos en de relatie tussen het benthos en enkele geselecteerde abiotische parameters. In het onderzochte gebied neemt de diepte toe van 25 m in het zuiden tot 50 m in de Oester Gronden. Tussen de 30 en 40 m dieptelijnen ligt een bodemzone, verrijkt met slib, chlorofyl-a en POC, ook wel bekend als het Friese Front gebied.

In totaal zijn op 78 locaties bodemmonsters genomen met een Reineck boxcorer om het meiobenthos, het macrobenthos en enkele sediment-parameters te analyseren. Aanvullende data van nog eens 7 locaties in het onderzochte gebied, die gedurende het EXP*BMN programma 1991 werden verzameld (Duineveld, in prep.; Huys & De Smet, 1992), zijn in de dataset opgenomen.

In de 85 meiobenthos monsters die zijn bestudeerd, zijn 14 permanente taxa gevonden. De dichtheid vertoonde een maximum van 9592 ind./10 cm^2 en een minimum van 417 ind./10 cm^2 met een gemiddelde waarde van 2773 ind./10 cm^2. Nematoda vormden met 94 % van de dichtheid het belangrijkste taxon binnen het meiobenthos.

In totaal werden 190 macrobenthische soorten gedetermineerd in 85 uitgezochte monsters. Het aantal soorten fluctueerde tussen 9 en 35 per monster. De macrobenthische dichtheid varieerde van 322 tot 22135 ind./m^2 met een gemiddelde van 5154 ind./m^2. De biomassa liep uiteen van 1 tot 111 g AFDW/m^2 met een gemiddelde van 18 g AFDW/m^2. Het Polychaeta taxon was in het gehele gebied dominant zowel in dichtheid als in biomassa (52 en 30 %).

Toepassing van de TWINSPAN-cluster analyse (Hill, 1979) op het onderzoeksgebied van 1991, gebaseerd op taxon-niveau van de meiobenthos dichtheid, respectievelijk op soorts-niveau van de macrobenthos dichtheid, gaven in het algemeen een overeenkomstige verdeling te zien en resulteerde in de volgende 4 hoofdclusters (Table 6 en 11):

cluster 1. Het Friese Front gebied en het centrale deel van de Oester Gronden. Slibbig fijn zand met hoge chlorofyl-a en POC gehaltes.
* zeer hoge meiobenthische dichtheid (3719.8 ind./10 cm^2) alsook Nematoda (3608.5 ind./10 cm^2) dichtheid en een lage diversiteit.
* de hoogste gemiddelde biomassa (23.6 g AFDW/m^2) in het macrobenthos en een hoge diversiteit.

cluster 2. Het oostelijke en westelijke deel van de Oester Gronden, samen met het zuidelijke deel van het studiegebied (meiobenthos) en het noordelijke deel van de Oester Gronden (macrobenthos).
* tussenliggende meiobenthische dichtheid (2280.7 ind./10 cm^2) en een lage diversiteit.
* het hoogste gemiddelde aantal macrobenthische soorten (27.32 per monster).

cluster 3. Het zuidelijk deel van het Friese Front.
* het verschijnen van interstitiële meiobenthische taxa in hogere dichtheden, terwijl de diversiteit iets hoger lag dan in de eerste twee clusters.
* de hoogste gemiddelde dichtheid in het macrobenthos (4528.2 ind./m^2), met een lage diversiteit.

cluster 4. Het zuidoostelijke en zuidwestelijke deel van het onderzoeksgebied, met grof zand.
* alle taxa, uitgezonderd Nematoda, Kinorhyncha en Priapulida, waren in relatief hoge dichtheden aanwezig; de diversiteit was relatief hoog.
* de laagste gemiddelde waardes van macrobenthische dichtheid (965.6 ind./m^2), biomassa (5.2 g AFDW/m^2) en aantal soorten (15.67 per monster).

1 PREFACE

The MILZON-BENTHOS II project is the continuation of the MILZON-BENTHOS I project (Zevenboom & Leewis, 1987; Zevenboom, 1991).

The achievement of a deeper understanding of the functioning of the North Sea ecosystem is necessary in order to carry out an appropriate and efficient management of the North Sea. This knowledge is of importance not only in the assessment of the effect of human activities (e.g. discharges into the sea, offshore mining, fishery etc.), but also in relation to the drafting/framing of international conventions/treaties.

The MILZON (=MILieuZONering Noordzee/Environmental Zonation North Sea) projects I and II were drafted to make an inventory of the spatial distribution of the zoobenthos on the DCS (Dutch Continental Shelf) and consequently to distinguish areas based on benthic ecosystem characteristics. Within the framework of these projects, extensive surveys of the zoobenthos of the Dutch coastal area have been carried out in the years 1987-89 (Groenewold & van Scheppingen, 1989, 1990; van Scheppingen & Groenewold, 1990), and of the northern part in 1991 (this report).

The objectives of the project in 1991 are to:

1. Compile an inventory of the macrozoobenthos (species composition, density and biomass) and meiozoobenthos (taxon composition and density) in the northern part of the environmental zone, mentioned in the Watersystem Management Plan North Sea 1991-1995 (Anonymous, 1991).
2. Determine the heterogeneity in the spatial distribution of the macrozoobenthos c.q. meiozoobenthos.
3. Distinguish similar groups of assemblages by statistical analysis.
4. Compare and integrate the present data with overlapping stations of the temporal "trend" monitoring program of Rijkswaterstaat (EXP*BMN project) as well as with the survey area that is already being mapped (MILZON-BENTHOS I project, program 1988/1989).

2 INTRODUCTION

2.1 General

In the Southern Bight, the southern part of the Dutch Continental Shelf (DCS) in the North Sea, the depth ranges from 0 m (coastline) to 30 m. To the north, a rather sharp boundary around 53°30'N in the west and around 53°50'N in the east separates this southern part from the Oyster Ground (Fig. 1 a,b). In this area of transition from the Southern to the Central North Sea, the Frisian Front (de Gee et al., 1991), the water depth increases from 30 to 40 m over a relatively short distance. Further north, the depth gradually increases to about 50 m, with one deeper spot (50-60 m) called Puzzle Hole. Northwest of the Oyster Ground, this pattern is disrupted by the Dogger Bank (10-30 m).

Offshore parts in the Southern Bight have strong tidal currents and the bottom sediment consists mainly of sand. Near to the coast this is sometimes mixed with mud, and in a few cases the sediment consists of gravel. In the transition zone tidal current velocities decrease sharply, with a sharp drop in depth at the Frisian Front area, resulting in the deposition of mud and detritus on the bottom. This zone is therefore known to be rich in suspended organic material and in macrobenthic fauna (Creutzberg et al., 1984). Periods of strong wind can bring part of the sediment into resuspension. In the Oyster Ground, tidal currents are weak; in summertime, under favourable conditions, stratification of the water column can occur in these areas with low current velocities. The upper warmer layer is separated from the colder bottom layer by a thermocline, restricting exchange between the two layers. In the Southern Bight the strong tidal currents prevent the development of stratification.

In the Dutch part of the Southern and Central North Sea, several watermasses are formed as a result of the tidal movement and the influence of predominantly westerly winds. This water flows into the North Sea through the English Channel and through the connection with the North Atlantic Ocean in the north. Depending on its origin and the outflow of river water, different watermasses can be found in this area: Continental coastal water (mixture of Atlantic Ocean- and Continental river water), English Channel water (unmixed Atlantic Ocean water) and Central North Sea water (unmixed Atlantic Ocean water) (Lee, 1970). Fronts mark the boundaries between the watermasses, which can differ in biological as well as chemical characteristics (Pingree & Griffiths, 1978).

Interest in the composition of the zoobenthos in the North Sea and its relationship with the abiotic environment (sediment composition, depth, salinity etc.) has increased since the introduction of the concept of large-scale marine assemblages at the beginning of this century. This concept facilitates studies, modelling and management of large surface areas. A recent contribution to the knowledge about the distribution of marine bottom assemblages in the North Sea has been the ICES North Sea Benthos Survey conducted by the Benthos Ecology Working Group of ICES in 1986. This synoptic mapping of the infauna of the North Sea therefore should act as a basis for all further comparisons on natural and anthropogenic changes in the benthos since it is the first synoptic overview.

In the period from 1987 to 1989, extensive surveys were carried out to study the meio- and macrozoobenthos of the Dutch coastal area in more detail (Groenewold & van Scheppingen, 1989, 1990; van Scheppingen & Groenewold, 1990). The coastal area belongs to the sandy part of the southern North Sea, but locally, i.e. near the coast, muddy patches can be found. Fine grained sandy sediment was found near the coast and in the northern part from Terschelling to Rottumerplaat. The benthic surveys showed the presence of three zones parallel to the Dutch coast. The zone nearest to the coastline was characterized by high zoobenthos densities, fine sand and a high content of mud. The meiobenthos in this zone was composed of only few taxa, with nematodes being the numerically dominant group. The macrobenthos was found to be dominated by polychaetes and bivalves. In the transition zone, intermediate densities of zoobenthos were found. Among the meiobenthic taxa, copepods and gastrotrichs were important (each ~ 10-15 %). The macrobenthos consisted of a mixture of coastal and offshore species. The offshore zone was characterized by low zoobenthos densities. The meiobenthos was not characterized by anyone taxon in particular, although the number of taxa was high in the west and low in the north. The macrobenthos was dominated by polychaetes in terms of density and by echinoderms in terms of biomass. An exception to this zonation was formed by some areas with (relict Pleistocene) coarse sand, where a taxon-rich meiobenthic assemblage and a impoverished (species, density and biomass) macrobenthic assemblage was found.

2.2 The investigation area

Prior to sampling, the investigated area was divided into 18 compartments with a presumed homogeneity in terms of sediment composition, depth and species composition (Duineveld et al., 1990, van Scheppingen & Groenewold, 1990) (Figs. 1a, 2 and 3). The smallest compartments were situated nearest to the coast in the sandy area, where the steepest physical gradients and the largest heterogeneity in zoobenthos composition were expected. Depending on the surface area of the compartments, 3, 4 or 5 stations were selected according to the "stratified random sampling"-method with the restriction that all stations had to be at least 2 nautical miles from former or existing drilling locations. The sampling and analysis were carried out according to the Rijkswaterstaat protocol for benthic fauna DCS (Essink, 1991) in combination with the standard regulations for meio- and macrobenthos in the southern North Sea (Holtmann, 1990a & b).

2.3 Acknowledgements

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3 MATERIAL AND METHODS

3.1 Sampling

In the period 21 May - 3 July 1991, sediment samples were collected at 78 stations with the R/V Holland (Holtmann & Groenewold, 1991). Additional data from another 7 stations located within the present study area, which were sampled in May 1991 during the EXP*BMN program (Duineveld, 1992), have been incorporated in the dataset (Fig. 2). These samples had been treated in the same way as the ones collected for this survey.

At each station, two boxcore samples were taken with a Reineck boxcorer (0.068 m^2). The required minimal depth of the boxcore samples was set at 14 cm. One boxcore was subsampled for meiobenthos (1 core of minimal 14 cm depth and ϕ of 3.4 cm), sediment grain size (2 cores of 10 cm depth and ϕ of 3.4 cm), and for POC and chlorophyll-a (2 cores of 3 cm depth and ϕ of 11 mm). The other boxcore sample was used for macrobenthos analysis. For this purpose, the sample was washed on board through a sieve with round holes of 1 mm diameter. The macrobenthic residue as well as the entire meiobenthos subsample were preserved in a (meiobenthos: 70°C heated) borax-buffered solution of 4-6 % formaldehyde in seawater. The subsamples collected for sediment grain size analysis, mud content (fraction $< 63\ \mu m$), chlorophyll-a and POC analyses were immediately frozen at -20°C and analyzed within 6 months after sampling.

3.2 Treatment of samples

The subsamples collected for sediment grain size, mud- (fraction $< 63\ \mu m$), chlorophyll-a and POC contents were analyzed at the analytical department of RWS-Tidal Water Division in Middelburg. Procedures are according to the standard regulations for meio- and macrobenthos in the southern North Sea (Holtmann, 1990a & b).

In the laboratory, rose-bengal was added to the meio- and macrobenthic samples to facilitate sorting. The meiofauna of sandy subsamples was separated by means of decantation through a 38 μm sieve. If the subsamples contained a high mud content, the meiofauna was separated by means of the 'Ludox' method (Heip et al., 1985) at the State University of Gent. The meiofauna were sorted at taxon level.

Prior to sorting, the macrobenthos samples were fractionated over a set of 4 nested stainless steel sieves with the smallest mesh size of 0.5 mm. The roughly equal particle size in the four residues improved the efficiency of sorting organisms from the debris. Density (individuals/m^2) and biomass (g Ash-Free Dry Weight/m^2) were, if possible, recorded at the species level and otherwise at a higher taxonomic level. For some groups of macrofauna (Bivalvia, Echinoidea) the sizes of individuals were noted and, if clearly discernible, the juvenile species were recorded. The biomass (g AFDW/m^2) of the macrobenthos was determined by drying the organisms at 60°C for at least 60 hours and subsequently incinerating them at 520°C for 4 hours. Some representatives of the Crustacea (amphipods, isopods and cumaceans), were assigned an average individual AFDW (0.3-0.5 mg) which was derived from data obtained during the MILZON-BENTHOS I project 1989.

More information about sampling and sample treatment on board the ship can be found in the cruise report of MILZON-BENTHOS II 1991 (Holtmann & Groenewold, 1991).

3.3 Statistical analysis

3.3.1 Diversity

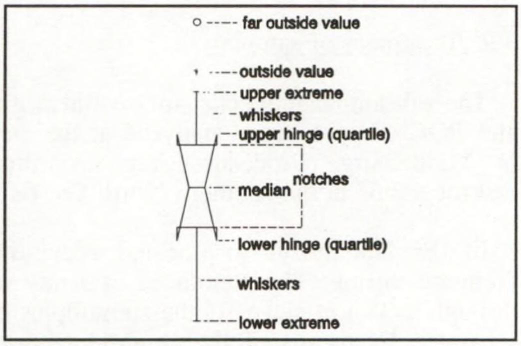
The zoobenthic diversity in the investigated area is expressed by Hill's diversity numbers (Hill, 1973). The relationship between the commonly used measures of diversity and Hill's numbers is as follows:

N_0 = $Hill_0$ = the number of species/taxa
N_1 = $Hill_1$ = exp(H') (H' = Shannon-Wiener index; Shannon & Weaver, 1949)
N_2 = $Hill_2$ = 1/SI (SI = Simpson index of dominance; Simpson, 1949).
N_∞ = $Hill_\infty$ = the reciprocal of the proportional abundance of the most common species/taxa

3.3.2 Classification

Stations were grouped into clusters with TWINSPAN (Hill, 1979). One such classification was made on the basis of species abundance and another using species biomass (macrobenthos only). The classification of the 1991 area is marked with the cluster numbers 1-4 and of the 1989-1991 area with the cluster numbers I-IV. For meio- and macrobenthos the same symbols were used for similar TWINSPAN clusters.

To illustrate the differences between the clusters with respect to selected biotic and abiotic parameters, notched box and whisker plots were drawn using SYSTAT 5.0 (SYSTAT inc. IL, USA). Because these plots show the medians and their simultaneous confidence intervals of the different groups, they allow a direct assessment of significant differences between median values of the groups (McGill et al., 1978).



box and whisker plot

3.3.3 Correlations

In order to gain more insight into the factors influencing the zoobenthos distribution, linear correlations (Pearsons r) between abiotic and biotic parameters were calculated and tested for significance ($P < 0.05$). Prior to the calculations, all data were log(x+1)-transformed.

4 RESULTS

4.1 Environmental parameters

Depth recordings, uncorrected for differences due to the tidal cycle, with a mean tidal amplitude of about 1.5 m, were made in the investigated area of the MILZON-BENTHOS II 1991 project (Fig 1-3). In the southern part (Vlieland Ground and Terschelling Bank, compartments 14-18) these ranged from 25 to 30 m (Fig. 4, Table 1). In the vicinity of the Frisian Front (compartments 10-13 and parts of 9-12), the depth increased from circa 30 to 40 m. In the Oyster Ground, depths varied between 40 and 50 m, with an exception of the northernmost station in compartment 2 (51 m, Puzzle Hole). These figures are in accordance with the official soundings (Hydrographical charts).

The median grain size of the sediment decreased from south to north (Fig. 5). South of the 30 m isobath, the sediment consists of locally coarse to predominantly medium/fine sand with a low mud content (0-10 %). Between the 30 and 40 m isobath there is an abrupt increase in the percentage mud (< 63 μm) of the sediment with maximum levels surpassing 20 % at the Frisian Front (Fig. 6). To the east of the transition area, i.e. in compartment 10, the sediment consists of fine to coarse sand with a low mud content. North of the 40 m isobath, in the Oyster Ground, the percentage mud ranges from 5 to 20 % with the highest values in the central part. The western part of the Oyster Ground contains sediments with the lowest median grain size of the whole study area, the eastern part with higher median grain sizes is situated in or near the pleistocene river Elbe estuary (compartments 3 and 6).

High concentrations of chlorophyll-a and POC in the upper 3 cm of the sediment were found near the Frisian Front area (Fig. 7 and 8, Table 2) even though the values were measured at various times over a 2 month period (Holtmann & Groenewold, 1991). Lowest POC contents were invariably found in the sandy sediment south of the 30 m isobath (Fig. 8).

Fig. 4-6 show that the concept of stratified random sampling, in which compartments were considered to be more or less homogeneous in depth and sediment composition, worked well. Only the compartments 7 to 13 (in and around the Frisian Front area) were more heterogeneous than expected, although their surface area was rather small.

4.2 Meiobenthos

4.2.1 Taxon composition and diversity

The present survey revealed the presence of 14 permanent meiobenthic taxa over the whole study area (Table 3). An additional number of 14 temporary (e.g. juvenile macrobenthos) taxa were found. Appendix 1 presents the densities of both types. Meiofaunal densities of the EXP*BMN stations 1-5 (SM 30) and 3-5 (SM 58) are given in Huys & de Smet (1992). Only the permanent taxa have been used for further analyses. The Rotifera were not included in the total density of meiobenthos nor in any subsequent analysis. During washing, the samples became often contaminated with freshwater Rotifera (source: tap-water), which was discovered afterwards. Because of the resemblance between marine and freshwater Rotifera, it was impossible to assess the number of marine species (if any at all).

The Nematoda are by far the dominant group, accounting on average for 94 % of the total meiobenthos density (min = 69.4 %, max = 99.3 %)(Table 4). Copepoda ranked second to the Nematoda in abundance, with a mean share of only 3 %. All other taxa combined represent less than 1 % of the total. The most important of these are the soft-bodied taxa Gastrotricha and Turbellaria.

Means and ranges of Hill's diversity numbers for the meiofauna in the study area were as follows:

N_0 = $Hill_0$ = 3.0 - 11.0 (mean = 6.8)
N_1 = $Hill_1$ = 1.0 - 2.9 (mean = 1.3)
N_2 = $Hill_2$ = 1.0 - 1.9 (mean = 1.1)
N_∞ = $Hill_\infty$ = 1.0 - 1.4 (mean = 1.1)

The distributions of Hill's numbers (Fig. 9-12) show that meiobenthic diversity is highest in the in the coarse and medium/fine sandy sediments from the southwestern and southeastern part of the study area. The northern part also contains many taxa. Considering the whole area, Hill's diversity numbers decrease rapidly with increasing order, due to the high Nematoda numbers (Fig. 14). This is especially clear in the Frisian Front where relatively high numbers of taxa are found, but where most individuals belong to the Nematoda.

4.2.2 Density

The study area shows high meiobenthic densities. Total and mean density and respective taxon densities are given in Table 5. Highest densities are found in the Frisian Front area (Fig. 13), with a maximum of 9592 ind./10 cm² at station 12-4. The lowest density of 417 ind./10 cm², was found at station 4-2 in the Oyster Ground. On average, 2773 ind./10 cm² present in the study area (median = 2326 ind./10 cm²). The distribution of the Nematoda (Fig. 14) showed highest densities in the Frisian Front area and in the northern part of the Oyster Ground. Copepoda (both bigger burrowing forms and small interstitial species) were most abundant in the southwestern part and in the central Oyster Ground (Fig. 15a). The sandy southwestern part contained mainly interstitial copepods (Fig. 15b). The ratio between Nematoda and Copepoda (N/C ratio) was high all over the area except for the southwestern part (range: 3 to 2304, mean 120) (Fig. 16). Gastrotricha and Turbellaria were mainly present in the sandy southern area (Figs. 17 and 18). The Annelida-taxa, Archiannelida and Oligochaeta, were scarce and primarily present in sandy substrates, whereas Polychaeta were highest in the southern and western part, lowest in the Frisian Front and central Oyster Ground area with fine sediment (Figs. 19, 20 and 21). Hydrozoa and Tardigrada were mainly found in the sandy areas (Figs. 22 and 23). Ostracoda and Halacarida were found both in the sandy part as well as in the muddy part, with Ostracoda especially abundant in the Oyster Ground and Halacarida in the Frisian Front (Figs. 24 and 25). Kinorhyncha and Priapulida were restricted to the muddy parts (Figs. 26 and 27). Ectoprocta were only found at station 7-5 (META II).

Summarized: the sandy southern part contains higher densities of the meiobenthic taxa Copepoda (interstitial), Gastrotricha, Turbellaria, Annelida, Hydrozoa and Tardigrada. The Frisian Front area was marked by high Nematoda densities, higher abundances of Halacarida and Kinorhyncha, whereas the Oyster Ground contained higher densities of Nematoda and Ostracoda and the presence of Kinorhyncha and Priapulida.

4.2.3 Meiobenthic assemblages

TWINSPAN-classification, based on taxon abundance, of all the stations of 1991 resulted in the formation of 4 clusters (Table 6; Figs. 28 and 29). Table 6 represents the mean values of the meiobenthic and abiotic parameters per meiobenthos TWINSPAN cluster. The 'indicator species' at the first level was the group of Gastrotricha group (>10 ind./10 cm^2), which was characteristic for the clusters 3 and 4.

✳	cluster 1 =	The Frisian Front and the central Oyster Ground, consisting of muddy fine sand with relatively high contents of mud, chlorophyll-a and POC. Total meiobenthic as well as Nematoda densities were very high. Kinorhyncha and Priapulida were characteristic for this area, whereas Archiannelida and Oligochaeta were absent. Gastrotricha were scarce. Diversities were low.
●	cluster 2 =	The western and eastern part of the sampled Oyster Ground, with sediments built up of fine sand with still relatively high mud-, chlorophyll-a and POC contents, as well as the fine-grained sandy southern part. Densities were intermediate. Diversities were low at these stations. All taxa, except the Nematoda, were generally low in density or even absent. Half of all the stations were grouped in this cluster.
◀	cluster 3 =	Most stations belong to the coarse/medium grained sandy southern part and southern Frisian Front. Diversities were somewhat higher than the first two clusters. The interstitial taxa appeared in higher densities.
◇	cluster 4 =	A small group of stations in the coarse sandy southwestern and -eastern parts. Diversities were relatively high. All taxa, except Nematoda, Kinorhyncha and Priapulida were present in relatively high densities.

The depth differences between clusters 1 and 2 were significant from those of clusters 3 and 4, as shown in the box and whisker plots (Fig. 30a). The median grain size was significantly different between clusters 1, 3 and 4, but not between clusters 1 and 2. The mud content differed for all clusters and showed a decrease from cluster 1 to 4 (Table 6). Chlorophyll-a was not discriminative for the clusters, but the POC content was. Total density was not characteristic for the differences between the clusters, nor was the number of taxa (Fig. 30b). In contrast, the Hill diversities showed a difference between clusters 1 and 2 on one side and clusters 3 and 4 on the other side. Fig. 30c illustrates the differences between the clusters for the some of the most abundant taxa.

4.3 Macrobenthos

4.3.1 Species composition and diversity

A total of 190 species were identified from 85 boxcore samples (Table 7 and 8). The majority of the species are representatives of the Polychaeta (73 species), followed by the Crustacea (52 species), Mollusca (44 species) and Echinodermata (12 species). The remaining 12 species were not identified to the species level, but only recorded at higher taxonomic levels. The most common species, i.e. those occurring in more than 35 % of the stations, are listed in Table 9. The abundance patterns of these species are shown in Figs. 49-77.

Means and ranges of Hill's diversity numbers for the macrofauna in the study area are as follows:

N_0 = $Hill_0$ = 9.0 - 35.0 (mean = 23.4)
N_1 = $Hill_1$ = 1.3 - 21.6 (mean = 8.8)
N_2 = $Hill_2$ = 1.1 - 17.8 (mean = 5.5)
N_∞ = $Hill_\infty$ = 1.0 - 7.1 (mean = 3.0)

The number of species per boxcore sample ($Hill_0$) varied between 9 and 35, with the lowest values occurring at stations with coarse sand in compartments 14, 15 and 18 located in the southwestern and southeastern part of the study area (numbers of compartments are shown in Fig. 2). The highest values for $Hill_1$ and $Hill_2$ diversity, were recorded in deep areas of the Oyster Ground (Figs. 31-34). Stations with relatively low values for these diversity numbers are situated in the southern part of the study area, where a few species numerically dominate the macrobenthic assemblage. Examples of these species are the polychaetes Spiophanes bombyx, Magelona papillicornis, Lanice conchilega and the bivalve Tellina fabula (Figs. 63, 57, 55 and 67).

4.3.2 Density and biomass

All data about abundance and biomass of the macrobenthos are given in Appendix 2. The interim report of MILZON-BENTHOS II 1991 (Groenewold & Holtmann, 1991) contains more detailed results about the macrobenthos.

The total density of macrofauna ranged from 322 to 22135 ind./m² with a mean of 3154 ind./m² (Fig. 35). Figs. 36-39 shows the density distribution of the four major taxa Polychaeta, Crustacea, Mollusca and Echinodermata. Relatively high values for total density were found in the southern part of the study area, due to high abundances of Polychaeta and Mollusca.

Total macrofaunal biomass ranged from 1 to 111 g AFDW/m² with a mean value of 18 g AFDW/m². Fig. 40 shows that biomass is more patchy distributed than abundance (Fig. 35). Elevated biomass levels were predominantly found in the southern compartments 16 and 17 as well as at deeper locations with muddy sand (compare with Fig. 5). Frequently, high biomass values are due to the occurrence of a single adult specimen of large-sized species or by the dominance of a single species (Table 9), such as Amphiura filiformis, Echinocardium cordatum, Callianassa subterranea and Chaetopterus variopedatus (Figs. 72, 73, 70 and 52). The biomass distributions of the principal taxonomic groups are shown in Figs. 41-44. In general, the macrofauna in the study area was dominated by Polychaeta both in terms of density and in biomass (Table 10).

4.3.3 Macrobenthic assemblages

Using TWINSPAN classification based on species abundance, the stations of the 1991 study area were grouped into four clusters (Figs. 45 and 46). The geographical position of the clusters in Fig. 45 shows that there is a high degree of spatial segregation between clusters. The distribution of the clusters correlates well with the distribution of sediment types (Table 11). Because of this, the clusters can accordingly be described as follows:

- cluster 1 = The Frisian Front and central part of the Oyster Ground, with sediments composed of muddy fine sand with a relatively high content of mud, chlorophyll-a and POC. Depth varies between 35 and 51 m. Cluster 1 has the highest average biomass of macrofauna, which is presented in Table 11.
- cluster 2 = The deeper, northern part of the Oyster Ground covered with muddy fine sand with an intermediate mud content. Cluster 2 has the highest average number of macrobenthic species.
- cluster 3 = The shallow, fine sand area south of the Frisian Front. Cluster 3 has the highest average density of macrofauna.
- cluster 4 = The shallow coarse sand areas in the southeastern and southwestern part of the study area. The sediment had low contents of mud, chlorophyll-a and POC. Cluster 4 has the lowest average values for macrobenthic density, biomass and of species richness.

In Fig. 47, box and whisker plots give an overview of the differences between the four clusters in terms of abiotic and biotic parameters (Table 11). Most of the abiotic parameters differ between the four TWINSPAN clusters, but parameters as depth and median grain size show a high relationship between cluster 1 and 2 (Fig. 47a). For the macrobenthic parameters, the total density, total biomass and diversity showed a difference between clusters 1, 2, 3 on one side and cluster 4 on the other side (Fig. 47b). The density and biomass of Polychaeta, Crustacea, Mollusca and Echinodermata in most cases differ between cluster 1, 2 and cluster 3, 4 (Figs. 47c,-d).

The most abundant species of each cluster, i.e. those found at more than 70 % of the stations, are listed in Table 12 (Figs. 49-77). Among these macrobenthic species are the characteristic 'indicator species' characteristic for the TWINSPAN clusters shown in Fig. 46.

When describing the clusters in terms of dominant species, two main assemblages can be distinguished, corresponding with the first division of TWINSPAN (Fig. 46):

I Amphiura filiformis, Pholoe minuta, Callianassa subterranea assemblages of the northern part with muddy fine sand.
The characteristic species for the subdivision of this assemblages by TWINSPAN are:
cluster 1 : Chaetopterus variopedatus, Lumbrineris latreilii
cluster 2 : Harpinia antennaria, Mysella bidentata

II Spiophanes bombyx assemblages of the southern part with coarse/fine-sandy sediment.
The characteristic species for the subdivision of this assemblages by TWINSPAN are:
cluster 3 : Lanice conchilega, Magelona papillicornis, Tellina fabula
cluster 4 : Echinocyamus pusillus, Nephtys cirrosa

Classifying the stations of 1991 using TWINSPAN analysis on the basis of species biomass (Fig. 48) a division of the area similar to that for species abundances was found. A total of 8 stations was found to be allocated to a different group than found by species abundances (Fig. 45). These stations were located near the borders between the former clusters (mostly between cluster 1 and 2 (Frisian Front, Oyster Ground)).

4.4 Correlation between abiotic, meio- and macrobenthic parameters

Table 13 contains the matrix of correlation coefficients (Pearsons r) among the various abiotic parameters. The sediment parameters, mud and median grain size, are closely correlated. A significant correlation was also found between depth and sediment grain size; the sediments in deeper regions have higher mud contents and lower median grain sizes. Although a significant correlation was found between the percentage mud and the amounts of chlorophyll-a and POC in the sediment, these latter two parameters were not significantly correlated with depth.

Total meiobenthic density did not correlate with any of the abiotic parameters (Table 14). The median grain size however, showed a positive correlation with several taxa (Gastrotricha, Turbellaria, Archiannelida, Oligochaeta, Hydrozoa and Tardigrada), whereas the same taxa were negatively correlated to deeper areas enriched mud- and POC. Diversity was highest in shallow coarse sand areas and lowest in deeper muddy areas. Kinorhyncha on the contrary, were concentrated in deeper areas with high mud-, chlorophyll-a and POC contents.

The correlations of the macrobenthos with abiotic parameters (Table 15) can be summarized as follows: stations with a low density of Polychaeta, high density of Echinodermata, high total biomass, high biomasses of Crustacea and Echinodermata and high species richness ($Hill_0$) are concentrated in deeper areas with a high mud content. The chlorophyll-a content shows no relationship and POC content only a low correlation with macrobenthic factors, corresponding with the occurrence of an enriched zone of chlorophyll-a and POC content, but no higher macrobenthos density or biomass was found at the Frisian Front. Among the macrobenthic parameters, positive correlations were found between total macrofaunal density, densities of Polychaeta and Mollusca, and species richness. This could be expected considering the numerical dominance of these taxa at the southern stations (section 4.3.1). Diversity ($Hill_{1-\infty}$) showed negative correlations with the total density and with the densities of Polychaeta and Mollusca. Furthermore, Echinodermata (density, biomass) appear to be positively correlated with the Crustacea (density, biomass) and the density of Echinodermata negatively with the Polychaeta density. This is consistent with the previous observations of the Dutch coastal area (Van Scheppingen & Groenewold, 1990).

Three-dimensional plots (Figs. 78 and 79) were constructed to illustrate the relationship of depth, median grain size, mud, chl.a and POC content of each cluster of the MILZON-BENTHOS II area 1991 of the meio- and macrobenthos. Stations in Figs. 78 and 79 are marked with the same symbols as used for the meio- and macrobenthos TWINSPAN classification (cf. Figs. 28 and 45). The plots show the interactive effect of abiotic parameters on the segregation of the TWINSPAN groups. Clear gradients of depth and mud content with cluster 1 and 2 at the greatest depth and highest mud content and cluster 4 at the other end (shallow and sandy). Median grain size superimposes a tendency from fine sand (cluster 1 and 2) to coarse sand (cluster 4). Cluster 3 takes an intermediary position. Together with the average values of the sediment characteristics listed in Table 6 and 11, the three-dimensional plots show that the four cluster groups clearly differ with respect to the environmental parameters.

The fact that the distribution of the TWINSPAN clusters of meio- and macrobenthos shows similar geographical patterns, with different meio- and macrobenthic parameters of each cluster, agree with the results of correlations between the macrobenthic and meiobenthic parameters (Table 16). In most cases these correlations were found to be negative. This relationship had been previously observed during the MILZON-BENTHOS I project (van Scheppingen & Groenewold, 1990). In the investigated area of 1991 clear negative correlations between the meiobenthic diversity and macrobenthic factors such as total density, density and biomass of the Echinodermata and the species richness are seen. Only the meiobenthic taxon Kinorhyncha is significantly positively correlated to some of the macrobenthic parameters.

In the MILZON-BENTHOS studies I and II, areas with coarse sand (and high tidal current velocities) are generally relatively rich in meiobenthic taxon diversity and poor in macrobenthic species diversity. Part of these differences could be due to differences in larval behaviour. Most macrobenthic species produce pelagic larvae. These larvae are easily transported by the high current velocities in these coarse sandy areas, thus preventing mass settlement, whereas most meiobenthic larvae are sedentary and less susceptible to transportation (G. Duineveld & M. Vincx, pers. comm.)

5 DISCUSSION

5.1 Meiobenthos

Previous data on meiobenthic densities and composition in the Frisian Front/Oyster Ground area are available from the North Sea Benthos Survey (ICES) study by Huys et al. (1992). Incorporation of ICES data (Huys, 1991) in the present dataset resulted in the same cluster pattern, although the stations were sampled in 1986 (compare Figs. 28 and 80). Because of annual fluctuations in meiobenthic density and the small scale spatial differences in density distribution, stations have not been compared pairwise. De Wilde et al. (1984) counted high nematode densities on the META II and III stations in the Frisian Front and Oyster Ground area. A previous study of 3 stations (META I, II and III, Fig. 3) in the course of one year (1982-83), positioned respectively in the sandy southern part, the Frisian Front and the northern Oyster Ground of the study area (Groenewold unpubl.) had already showed remarkable differences, with nematode densities and dominance of respectively 736, 3716 and 1640 ind./10 cm² and 65, 94 and 84 % dominance of the total meiobenthos. Copepods made up respectively 4.3, 1.3 and 3.8 % of the meiobenthos. An estimated dry weight biomass (literature based) of these stations gave values of 0.9, 1.2 and 0.8 mg/10 cm² at the sandy, sandy silt and silty sand station respectively. Comparison of the composition of these stations with the present data is hampered by the fact that in 1983 several taxa (Tardigrada, Archiannelida, Oligochaeta, Priapulida, Hydrozoa, Halacarida, Gastrotricha) were not distinguished as separate taxa, but instead classified into larger groups. The fluctuation then found occurring throughout the year emphasizes the need to sample in the same period of the year. Juario (1975) reports meiobenthic densities ranging from 3047 to 5261 ind./10 cm² (93-99 % dominance) in a silty sand station (mud content ~ 25 %, median grain size 93 μm) in the German Bight and copepod abundance between 0.5 and 5 %. Meiobenthic dry weight biomass at this station ranged from 0.6 to 1.3 mg/10 cm ².

A classification (TWINSPAN) is made of the present data combined with the meiobenthic data of the MILZON-BENTHOS I project (1988-89), for a total of 368 stations (15 taxa). The aggregated information of the three years is somewhat different from the 1988-1989 studies (Figs. 81 and 82). A small coastal zone of approximately 5 km width, with high nematode and low copepod densities and high mud contents, belongs to the same cluster as the majority of the Frisian Front-Oyster Ground area (also characterized by the presence of kinorhynchs and higher copepod densities) (66 stations in total). Going in offshore direction, a transition zone is found, characterized by high abundances of copepods and gastrotrichs (Fig. 83 a-e). The sandy offshore area can be divided into two zones (clusters): a western and a northern zone. Both zones are inhabited by low numbers of meiobenthos. The stations in the western part, containing coarse sand and low mud contents, were more diverse than the stations in the northern area, with finer sediment and higher mud contents. All stations of compartment 4 in the Oyster Ground also belonged to the northern cluster. A separate cluster is formed by 36 stations, all positioned in the areas of coarsest sediment, characterized by high (taxon-) diverse meiobenthic assemblages. In comparison with the data of the coastal studies (1988, 1989), total densities were much higher in the 1991 study area (Fig. 83a). Observations on Copepoda showed that, except for the muddy near-coastal area (with lowest densities), the majority of the specimen of the sandy coastal area are interstitial copepods, whereas the copepodes of the Frisian Front and Oyster Ground are burrowing forms. Gastrotricha and Turbellaria were clearly less abundant in the northeast silty area (Fig. 83d and e).

Classification based on taxon densities is far less accurate than studies at species level, as changes in species composition due to environmental influences are undetectable. Huys & De Smet (1992) and Huys et al. (1992) distinguished three copepod assemblages on the Dutch Continental Shelf on the basis of samples taken in 1986. This was confirmed by the 1991 biomonitoring survey in the same area carried out in the framework of the longterm monitoring project EXP*BMN (Huys & De Smet, 1992). The results of the present study, which uses taxon-based TWINSPAN groups differs somewhat from their classification. On the other hand, classification on taxon level together with the density distribution, still gives far more information than density distributions alone could give. The data of 1991 however, showed that classification of the meiobenthos on taxon level gives sharper boundaries between the clusters as the gradient in sediment becomes larger.

The N/C ratio, introduced as an indicative tool for the presence of specific forms of pollution (Raffaelli, 1987), which has already been a subject to criticism by several authors (Coull et al., 1981; Lambshead, 1986; Huys et al., 1992), was high in the Frisian Front and Oyster Ground area. This N/C ratio, as it is influenced by a variety of factors, a.o. higher densities of nematodes in fine sediments is independent of the presence and/or nature of pollution. As the nematode concentration in the study area of 1991 is already higher than in the coastal area (Table 4), it would be too far-fetched to conclude heavy interference in the area. Huys et al. (1992) concluded that the concept of using the N/C ratio as pollution indicator cannot be extended to the subtidal. Therefore it is not reliable for the diffusive sources of contamination in the North Sea.

5.2 Macrobenthos

Because the investigated area could be divided into distinct benthic assemblages, the present results can be compared with earlier classifications of the macrobenthos in the southern North Sea. The assemblages that were found on the basis of the data from the ICES North Sea Benthos Survey (1986; Duineveld et al. (1991)), bear considerable resemblance in terms of geographical distribution and species composition to the ones in Fig. 45. Because of the clear differences in the depth range and sediment type in their four assemblages, Duineveld et al. (1991) described them as a shallow muddy sand cluster (=MILZON cluster 1 and 2, Amphiura filiformis and Pholoe minuta (Figs. 72 and 61), a shallow fine sand cluster (=MILZON cluster 3, Magelona papillicornis and Tellina fabula (Figs. 57 and 67)), and a shallow coarse sand cluster (=MILZON cluster 4, Echinocyamus pusillus (Fig. 74)). Earlier, Salzwedel et al. (1985) made a classification of the macrobenthos in the adjacent German Bight where similar gradients and types of sediment are found. They too distinguished an Amphiura filiformis (Fig. 72) association (MILZON cluster 1 and 2) typical for the deeper muddy sands, a Tellina fabula, Spiophanes bombyx association (Figs. 67 and 63) (MILZON cluster 3) from the fine sand and a Goniadella bobretzkii association from coarse sand which can be compared to the MILZON cluster 4.

After incorporating the macrobenthic data from the MILZON-BENTHOS I project (1988-1989) into the present dataset of MILZON-BENTHOS II (1991), a TWINSPAN classification was made of all 431 samples taken in the area covered by the two studies (Figs. 84 and 85). The position of the clusters in Fig. 84 shows that comparable assemblages and borders were found as in the separate investigations of 1988, 1989 and 1991. The 66 stations of the coastal assemblage, cluster IV (Macoma baltica, Tellina fabula, Spisula subtruncata, Nephtys hombergii, Capitella capitata and Anaitides mucosa; Fig. 65, 67, 66, 59, 50 and 49) combined with the 309 stations of the intermediate assemblage, cluster III (Bathyporeia elegans; Fig. 69) together formed the area studied in 1988 and 1989. The two other assemblages, (Amphiura filiformis, Callianassa subterranea, Pholoe minuta, Harpinia antennaria; Figs. 72, 70, 61 and 71), which are situated more offshore, coincide with the area near the Frisian Front and the Oyster Ground which were studied in the present survey, cluster I and II. The fact that samples from areas where the surveys overlapped were put into the same cluster (cluster III), shows that the species composition of the macrobenthic community in these areas has remained stable between 1988 and 1991 in the coastal zone.

Previous data on macrobenthic biomass in the southern North Sea have been published by Rachor (1982), Creutzberg et al. (1984), Cadée (1984), de Wilde et al. (1984) and Duineveld et al. (1990). Rachor (1982) reports values for the Oyster Ground ranging from 1.1 to 8.0 g $AFDW/m^2$, whereas in 1982 Creutzberg et al. (1984) found an average biomass of 6.1 g $AFDW/m^2$ in the Oyster Ground and 13.2 g $AFDW/m^2$ at the Frisian Front. On the basis of subsequent surveys in 1984, de Wilde et al.(1984) reported values of more than 30 g $AFDW/m^2$ for the Frisian Front area and values between 12-18 g $AFDW/m^2$ for the central part of the Oyster Ground. Cadée (1984) reported an average biomass value of 10.6 g $AFDW/m^2$ from the northern Oyster Ground area and 25.6 g $AFDW/m^2$ for the Frisian Front. In 1986, Duineveld et al. (1990) found a biomass between 10-20 g $AFDW/m^2$ on the Oyster Ground and values over 20 g $AFDW/m^2$ near the Frisian Front. Those estimates obtained in 1984 and afterwards, agree especially well with the biomass distribution found in the present investigation (Fig. 40). The lower estimates from the preceding period may have been due to the use of Van Veen grabs instead of boxcorers for obtaining samples.

The first detailed study of the Frisian Front area was made by Creutzberg et al. (1984). They found a comparatively rich benthic assemblage with a distinct zonation of species and biomass across the frontal area. Starting in the fine sand south of the 30 m isobath and ending in the muddy sand north of the 40 m isobath, they found the following sequence of characteristic species: Tellina fabula, Abra alba, Chaetopterus variopedatus (Figs. 67, 64 and 52) and Turritella communis. The authors also produced a detailed sediment map showing a distinct zone with maximum mud content north of the 30 m isobath where the highest amounts of POC were found. The same zone with high mud and POC content of the sediment was found in the present survey, i.e compartments 7, 8, 9, 11, 12 and 13 (Figs. 6 and 8). This zone, moreover, contained the highest sediment concentrations of chlorophyll-a (Fig. 7). The present data (Fig. 40), however, do not confirm the zonation of biomass found by Creutzberg et al. (1984). Some indications for the presence of a species zonation as reported by Creutzberg et al. (op cit.) can be found when overlaying the distribution maps of the species in question (Figs. 67, 64 and 52). This shows that maximum abundances of Tellina fabula were found south of the 30 m isobath, those of Abra alba just north of this depth contour and those of Chaetopterus variopedatus still further north. Because of differences in sampling design and methods, it is not possible to verify in detail the fine distribution patterns that were found earlier.

De Gee et al. (1991) in their overview of results from studies in the Frisian Front area, postulate that the species zonation described by Creutzberg et al. (1984) may be subject to year to year variations. This applies, for instance, to the bivalve Abra alba (Fig. 64), which was not found again in the period between Creutzberg's survey and the present one. Also, the density distribution of the ophiuroid Amphiura filiformis (Fig. 72) seems to have changed since the time of the first surveys across the Frisian Front. Creutzberg (unpubl.) found the highest densities of this species in the area between the 30 and 40 m isobaths, and considerably lower densities (< 500 ind./m^2) in the central Oyster Ground. At present, however, this ophiuroid occurs with high abundances throughout a much wider area as shown by Fig. 72.

Because several of the compartments from the present study had also been sampled during the ICES North Sea Benthos Survey in 1986, it is possible to look for changes in the benthic assemblage and density of some common species. Since the same sampling gear (boxcorer) was used, deep burrowing species can also be taken into account in this comparison. Fig. 3 shows the stations sampled during MILZON-BENTHOS II 1991, including 12 stations (5 samples per station) sampled by the ICES survey in 1986. Fig. 86 shows the result of a TWINSPAN classification with the combined data from the present and the ICES survey. Besides ICES station 42 all of the stations of the ICES survey were grouped into the same cluster as their adjacent MILZON-BENTHOS II 1991 stations. Thus no major shift in the gross composition of the assemblage seems to have taken place since 1986. Total macrobenthic biomass, density as well as the density of some common species from both surveys, ICES 1986 and MILZON-BENTHOS II 1991, have been plotted in Fig. 87 to examine possible changes in the macrobenthos. For these comparisons only those stations from the MILZON-BENTHOS II 1991 that were in the vicinity of the ICES stations were selected (Table 17). Both curves of ICES (5 samples per station) and MILZON-BENTHOS II 1991 (1 sample per station) have the same general pattern, and for all parameters no significant changes can be noticed over 5 years. Some species show an increase in one area and a decrease in another area. The polychaete Chaetozone setosa and the ophiuroid Amphiura filiformis for example were found more to the north this year than found by ICES in 1986, which can be interpreted as a variation in distribution from year to year (as discussed earlier).

More information about the temporal changes of the benthos in the southern North Sea is to be expected from the long term monitoring program, started in spring 1990 (Holtmann et al., 1990c) and which has developed into a cooperative effort of the Tidal Water Division and the North Sea Directorate of Rijkswaterstaat, the Netherlands Institute for Sea Research (NIOZ) and the Centre for Estuarine and Marine Ecology (CEMO) (Duineveld, 1992; Huys & De Smet, 1992).

6 CONCLUSIONS

* The concept of stratified sampling, in which compartments were considered to be more or less homogeneous in depth and sediment composition based on earlier observations, worked well, allthough the Frisian Front area was more heterogeneous than expected.

The data of the zoobenthos distribution lead to the following conclusions:

Meiobenthos:

* High total meiobenthic densities were found in the Frisian Front area.
* The meiobenthos was overwhelmingly dominated by Nematoda (94 %).
* The highest values for $Hill_1$ and $Hill_2$ diversity were recorded in the coarse sandy southern area and in the northern Oyster Ground.
* The meiobenthos of the study area can, based on taxon densities, be divided into four clusters.
* The clusters show differences in sediment parameters (median grain size, mud-, chlorophyll-a and POC content).
* TWINSPAN classification of the whole area of the MILZON-BENTHOS I and II project shows more pronounced western and northern offshore sandy areas (zones), than classification based on the coastal sandy area (1988-89) alone would give.
* In comparison with the sandy coastal area, the Frisian Front and Oyster Ground area are less diverse. Interstitial taxa were mostly absent.
* The data of ICES (1986) and MILZON-BENTHOS II (1991) have in general the same pattern in terms of taxon density and composition.

Macrobenthos:

* The macrobenthos was dominated by Polychaeta (52 % of the density and 32 % of the biomass)
* The macrobenthos of the investigation area can be divided into four clusters by using TWINSPAN classification on the basis of species density and biomass.
* The clusters show clear differences in terms of the sediment parameters, such as mud content, median grain size, chlorophyll-a and POC content.
* Two clusters (1 & 2 and 3 & 4) can be described as one assemblage:
  - in the southern part a Spiophanes bombyx assemblage and
  - in the northern part a Amphiura filiformis assemblage were found.
* The TWINSPAN classification of the whole area of the MILZON-BENTHOS I and II project shows the same distribution of clusters as found in the separate investigations of 1988, 1989 and 1991.
* The distribution of the biomass and the macrobenthic clusters found in the present investigation agree well with earlier published data.
* The present data show a rich Frisian Front area in terms of high mud, POC and chlorophyll-a content, but no clear enriched macrobenthic zone in terms of total density or biomass has been found. Species as Tellina fabula, Abra alba and Chaetopterus variopedatus show a zonation of abundance from south to north.
* The data of the ICES (1986) and MILZON-BENTHOS II (1991) investigation have in general the same patterns in species composition, density and biomass. Thus, no significant changing of the macrobenthos in this area can be detected over this 5 year time span.

Meio-/macrobenthos:

* Negative correlations, but a fairly similar distribution of the 4 TWINSPAN clusters (the sediment parameters per cluster are similar but do have reversed densities and diversities)

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Tables

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Table 1a. Position, depth and sediment composition of the MILZON-BENTHOS II area 1991.
(/=values not available)
(*=stations sampled during the EXP*BMN 1991)

STATIONS NUMBER	NR	GEOGRAPHICAL POSITION	DEPTH (m)	MEDIAN (μm)	MUD (%)
1-1	1	54-39-00 N 03-42-30 E	45	111	8.6
1-2	2	54-33-00 N 03-26-30 E	43	118	6.5
1-3	3	54-23-00 N 03-25-30 E	48	106	5.9
1-4	4	54-18-30 N 03-38-30 E	45	146	6.1
* 1-5 SM 30	5	54-30-00 N 04-00-00 E	46	114	6.2
2-1	6	54-53-00 N 04-18-00 E	50	89	19.0
2-2	7	54-45-00 N 04-09-00 E	49	91	18.8
2-3	8	54-39-00 N 04-32-00 E	49	107	19.2
2-4	9	54-36-40 N 04-11-00 E	49	95	11.1
2-5	10	54-28-30 N 04-10-00 E	49	98	9.2
3-1	11	54-56-00 N 04-44-00 E	/	157	6.0
3-2	12	54-48-00 N 05-06-00 E	42	164	4.3
3-3	13	54-46-00 N 04-46-30 E	45	155	6.9
3-4	14	54-38-30 N 05-03-00 E	46	153	10.4
* 3-5 SM 58	15	55-00-00 N 05-00-00 E	42	151	7.1
4-1	16	54-16-00 N 04-03-00 E	48	105	12.9
4-2	17	54-04-30 N 04-08-00 E	48	107	13.7
4-3	18	54-04-00 N 03-50-00 E	48	116	10.5
4-4	19	53-58-30 N 04-20-34 E	45	118	10.0
* 4-5 TS 100	20	54-08-58 N 04-20-34 E	50	98	15.7
5-1	21	54-28-30 N 04-21-20 E	51	94	6.3
5-2	22	54-20-20 N 04-23-00 E	50	93	22.6
5-3	23	54-20-00 N 04-44-30 E	47	143	10.7
5-4	24	54-10-00 N 04-26-00 E	50	97	17.3
5-5	25	54-08-30 N 04-37-30 E	47	106	9.4
6-1	26	54-33-00 N 05-19-00 E	42	174	7.5
6-2	27	54-28-00 N 04-55-00 E	44	160	10.7
6-3	28	54-25-00 N 05-09-30 E	43	180	7.6
6-4	29	54-16-30 N 05-25-00 E	43	171	12.3
6-5	30	54-15-30 N 05-05-00 E	44	151	15.4
7-1	31	53-57-30 N 04-22-30 E	45	119	9.3
7-2	32	53-49-00 N 04-13-30 E	43	137	9.7
7-3	33	53-48-00 N 04-32-30 E	42	125	20.1
7-4	34	53-42-30 N 04-12-30 E	42	148	12.6
* 7-5 META 2	35	53-42-05 N 04-30-00 E	37	114	22.3
8-1	36	54-07-00 N 04-52-30 E	42	126	9.3
8-2	37	54-01-10 N 04-37-30 E	43	119	10.3
8-3	38	54-01-10 N 04-55-00 E	42	126	16.4
8-4	39	53-58-00 N 05-02-30 E	39	123	26.8
8-5	40	53-55-20 N 04-47-30 E	40	133	16.7
9-1	41	54-11-30 N 05-32-30 E	40	190	9.1
9-2	42	54-06-00 N 05-20-20 E	39	124	27.6
9-3	43	54-04-00 N 05-36-30 E	39	179	10.0
9-4	44	54-02-30 N 05-12-00 E	37	143	35.3
9-5	45	54-01-20 N 05-20-00 E	39	148	24.1

Table 1b. Position, depth and sediment composition of the MILZON-BENTHOS II area 1991.
(/=values not available)
(*=stations sampled during the EXP*BMN 1991)

STATIONS NUMBER	NR	GEOGRAPHICAL POSITION	DEPTH (m)	MEDIAN (μm)	MUD (%)
10-1	46	54-13-40 N 06-08-00 E	38	159	13.3
10-2	47	54-11-20 N 05-54-00 E	37	206	5.6
10-3	48	54-04-40 N 05-56-30 E	34	572	0.4
10-4	49	54-00-50 N 05-52-00 E	34	252	2.8
* 10-5 R 70	50	54-07-03 N 06-12-51 E	34	221	1.7
11-1	51	53-47-30 N 04-40-00 E	40	113	26.0
11-2	52	53-44-00 N 04-45-10 E	37	127	23.7
11-3	53	53-40-00 N 04-34-30 E	35	144	23.6
11-4	54	53-35-30 N 04-23-00 E	30	185	4.5
12-1	55	53-55-30 N 05-10-00 E	38	145	23.1
12-2	56	53-51-00 N 04-52-00 E	38	114	23.1
12-3	57	53-49-30 N 05-03-30 E	35	312	0.7
12-4	58	53-44-40 N 04-54-00 E	35	176	12.3
13-1	59	53-59-30 N 05-33-30 E	32	167	18.1
13-2	60	53-57-30 N 05-18-00 E	37	173	13.9
13-3	61	53-55-30 N 05-43-00 E	32	212	2.4
13-4	62	53-54-00 N 05-31-30 E	33	276	1.9
13-5	63	53-51-30 N 05-22-30 E	33	204	5.4
14-1	64	53-29-00 N 04-22-30 E	28	207	1.1
14-2	65	53-24-30 N 04-28-30 E	29	306	0.7
14-3	66	53-21-00 N 04-31-00 E	29	277	4.4
14-4	67	53-14-00 N 04-23-40 E	30	330	0.6
15-1	68	53-31-40 N 04-27-30 E	27	224	1.2
15-2	69	53-30-30 N 04-38-30 E	27	264	0.5
15-3	70	53-25-30 N 04-38-40 E	27	373	0.2
* 15-4 TS 30	71	53-36-50 N 04-56-18 E	26	216	0.0
16-1	72	53-45-00 N 05-17-00 E	32	192	5.8
16-2	73	53-42-00 N 05-05-00 E	33	185	5.5
16-3	74	53-40-00 N 04-57-30 E	31	197	2.0
16-4	75	53-40-30 N 05-14-00 E	30	190	3.1
17-1	76	53-50-00 N 05-45-00 E	32	204	1.9
17-2	77	53-42-30 N 05-25-30 E	30	236	1.4
17-3	78	53-46-00 N 05-37-00 E	/	193	4.9
17-4	79	53-47-00 N 05-29-00 E	/	195	4.5
17-5	80	53-44-30 N 05-46-30 E	28	191	3.5
18-1	81	53-56-00 N 06-04-00 E	31	211	3.1
18-2	82	53-51-30 N 05-59-00 E	30	209	2.0
18-3	83	53-52-00 N 06-19-00 E	29	334	0.2
18-4	84	53-45-30 N 05-59-00 E	25	271	0.5
* 18-5 R 50	85	53-57-14 N 06-18-36 E	31	371	0.4

Table 2a. Chlorophyll-a content (µg/g) and POC content (% C) of the upper 3 cm of the sediment in the MILZON-BENTHOS II area 1991. (/=values not available) (*=stations sampled during the EXP*BMN 1991)

STATIONS NUMBER	NUMBER	CHL.A (µg/g)	POC (% C)
1-1	1	0.74	0.3
1-2	2	0.48	0.2
1-3	3	1.17	0.4
1-4	4	0.48	0.2
* 1-5 SM 30	5	0.20	0.3
2-1	6	0.54	0.6
2-2	7	0.64	0.6
2-3	8	0.35	0.3
2-4	9	0.35	0.4
2-5	10	0.55	0.3
3-1	11	0.42	0.3
3-2	12	0.43	0.2
3-3	13	0.63	0.3
3-4	14	0.46	0.3
* 3-5 SM 58	15	0.49	/
4-1	16	0.78	0.4
4-2	17	2.10	0.5
4-3	18	2.14	0.6
4-4	19	0.23	0.2
* 4-5 TS 100	20	0.35	0.4
5-1	21	0.43	0.4
5-2	22	12.19	1.3
5-3	23	0.21	0.3
5-4	24	0.40	0.4
5-5	25	0.19	0.2
6-1	26	0.23	0.2
6-2	27	0.25	0.2
6-3	28	0.39	0.3
6-4	29	0.54	0.3
6-5	30	0.65	0.6
7-1	31	0.31	0.2
7-2	32	0.68	0.2
7-3	33	5.77	1.1
7-4	34	1.21	0.1
* 7-5 META 2	35	4.21	0.5
8-1	36	0.26	0.3
8-2	37	0.53	0.7
8-3	38	1.01	1.0
8-4	39	4.00	0.9
8-5	40	0.71	0.6
9-1	41	0.98	0.6
9-2	42	1.97	1.7
9-3	43	1.08	0.9
9-4	44	1.76	1.7
9-5	45	4.59	1.5

Table 2b. Chlorophyll-a content (µg/g) and POC content (% C) of the upper 3 cm of the sediment in the MILZON-BENTHOS II area 1991. (/=values not available) (*=stations sampled during the EXP*BMN 1991)

STATIONS NUMBER	NUMBER	CHL.A (µg/g)	POC (% C)
10-1	46	1.34	0.7
10-2	47	0.51	0.4
10-3	48	0.35	0.5
10-4	49	0.28	0.5
* 10-5 R 70	50	0.37	/
11-1	51	4.14	1.0
11-2	52	1.99	/
11-3	53	3.76	/
11-4	54	0.23	0.2
12-1	55	2.87	0.9
12-2	56	10.10	1.1
12-3	57	< 0.10	0.3
12-4	58	6.37	0.7
13-1	59	6.56	0.8
13-2	60	1.25	0.4
13-3	61	0.35	0.2
13-4	62	0.59	0.2
13-5	63	0.38	0.1
14-1	64	1.19	/
14-2	65	1.05	0.0
14-3	66	0.11	0.0
14-4	67	0.15	0.0
15-1	68	0.68	0.0
15-2	69	0.31	0.0
15-3	70	0.30	0.0
* 15-4 TS 30	71	/	/
16-1	72	0.69	0.2
16-2	73	0.84	0.2
16-3	74	0.69	0.3
16-4	75	2.18	0.3
17-1	76	0.28	0.1
17-2	77	0.14	0.1
17-3	78	1.58	0.3
17-4	79	4.35	0.1
17-5	80	1.00	0.3
18-1	81	0.99	0.3
18-2	82	0.30	/
18-3	83	0.17	0.0
18-4	84	< 0.10	0.1
* 18-5 R 50	85	0.13	/

Table 3. Systematics of the meiobenthos found in the MILZON-BENTHOS II area 1991 (relevant taxa are underlined).

Phylum Cnidaria
    Classis <u>Hydrozoa</u>

Phylum Plathyhelminthes
    Classis <u>Turbellaria</u>

Phylum <u>Gastrotricha</u>

Phylum <u>Kinorhyncha</u>

Phylum <u>Priapulida</u>

Phylum <u>Rotifera</u>

Phylum <u>Nematoda</u>

Phylum Annelida
    Classis <u>Polychaeta</u>
        Ordo <u>Archiannelida</u>
    Classis <u>Oligochaeta</u>

Phylum Arthropoda
    Classis Arachnida
            Fam. <u>Halacarida</u>
  Subphylum Crustacea
    Classis <u>Ostracoda</u>
    Classis Copepoda
        Ordo <u>Harpacticoida</u>

Phylum <u>Tardigrada</u>

Phylum <u>Entoprocta</u>

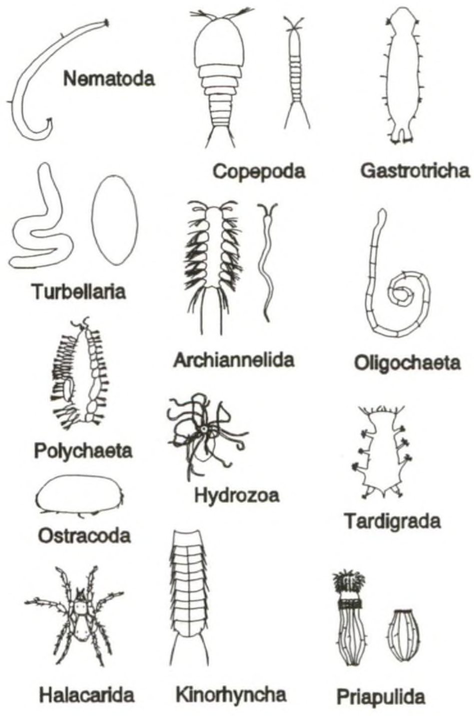


Table 4. Mean, median, minimum and maximum values of densities expressed in percentages, together with the corresponding standard deviation of the meiobenthic taxa in the MILZON-BENTHOS II area 1991.

	Mean	Median	Min.	Max.	St.dev.
Nematoda	93.94	96.53	69.41	99.32	6.56
Copepoda	3.21	1.89	0.04	22.43	4.18
Gastrotricha	0.80	0.03	0.00	13.67	2.25
Turbellaria	0.56	0.31	0.00	5.01	0.81
Archiannelida	0.03	0.00	0.00	0.67	0.11
Oligochaeta	0.03	0.00	0.00	0.78	0.12
Polychaeta	0.18	0.09	0.00	1.44	0.27
Hydrozoa	0.04	0.00	0.00	1.28	0.16
Tardigrada	0.30	0.00	0.00	4.31	0.76
Ostracoda	0.17	0.04	0.00	1.62	0.33
Halacarida	0.03	0.00	0.00	0.95	0.11
Kinorhyncha	0.15	0.04	0.00	1.18	0.23
Priapulida	0.02	0.00	0.00	0.48	0.06
Entoprocta	0.00	0.00	0.00	0.21	0.02

Table 5. Mean, median, minimum, and maximum values of densities (ind./10 cm^2) with the standard deviation and presence (in percentages) of the meiobenthic taxa in the MILZON-BENTHOS II area 1991. The Nematoda/Copepoda (N/C) ratio is also given.

	Mean	Median	Min.	Max.	St.dev.	%
Density	2773.1	2326.0	417	9592	1849.3	
Taxa	6.8	7.0	3	11	1.6	
Nematoda	2658.4	2217.0	350	9540	1856.7	100
Copepoda total	66.7	44.0	3	371	77.8	100
interstitial	23.6	0.0	0	347	71.7	29
Gastrotricha	16.3	1.0	0	396	50.7	57
Turbellaria	10.2	6.0	0	81	12.5	95
Archiannelida	0.6	0.0	0	13	2.1	8
Oligochaeta	0.6	0.0	0	25	3.0	10
Polychaeta	3.4	2.0	0	27	4.7	78
Hydrozoa	0.8	0.0	0	22	3.0	18
Tardigrada	6.5	0.0	0	93	16.5	44
Ostracoda	3.9	1.0	0	47	7.5	57
Halacarida	0.6	0.0	0	11	1.7	25
Kinorhyncha	4.9	1.0	0	57	9.4	58
Priapulida	0.3	0.0	0	3	0.7	17
Entoprocta	0.1	0.0	0	7	0.8	1
N/C ratio	120.1	50.8	3	2304	265.7	

Table 6. Mean values of abiotic and meiobenthic parameters of each meiobenthic TWINSPAN cluster, as shown in Figs. 28 and 29, with their standard deviation.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Symbol	⧆	◙	◀	◇
Number of locations	31	39	10	5
	mean/st.d.	mean/st.d.	mean/st.d.	mean/st.d.
<u>Abiotic parameters :</u>				
Depth (m)	42.2 / 5.4	39.3 / 7.1	29.4 / 3.0	29.8 / 2.6
Median grain size (μm)	128.6 / 29.1	172.0 / 55.7	234.3 / 38.4	383.0 /108.2
Mud content (%)	17.73/ 6.7	7.04/ 4.8	2.12/ 1.8	0.43/ 0.2
Chl.a content (μg/g)	2.50/ 3.0	0.87/ 1.0	0.42/ 0.3	0.40/ 0.4
POC content (% C)	0.71/ 0.4	0.32/ 0.2	0.11/ 0.1	0.10/ 0.2
<u>Meiobenthos :</u>				
Density (ind./10 cm^2)	3719.8/2231.1	2280.7/1474.2	2102.2/ 939.8	2085.8/ 906.4
Nematoda	3608.5/2239.5	2232.1/1468.4	1898.5/ 971.1	1613.2/ 772.6
Copepoda total	85.4/ 83.0	27.6/ 15.9	84.1/ 84.6	219.4/ 96.1
interstitial	12.5/ 62.5	0.8/ 2.6	54.7/ 88.8	209.2/ 97.4
Gastrotricha	0.5/ 0.8	2.2/ 2.6	67.1/ 46.5	123.2/ 156.4
Turbellaria	3.3/ 4.3	10.0/ 7.4	24.3/ 21.7	25.6/ 19.5
Archiannelida	0.3/ 1.6	0.0/ 0.0	0.8/ 2.5	6.0/ 4.1
Oligochaeta	0.0/ 0.2	0.2/ 1.1	0.1/ 0.3	8.2/ 10.1
Polychaeta	2.1/ 2.3	3.5/ 5.1	4.7/ 4.4	9.0/ 9.0
Hydrozoa	0.1/ 0.4	0.1/ 0.5	3.0/ 6.7	5.8/ 5.9
Tardigrada	0.8/ 3.3	2.4/ 3.4	18.2/ 23.6	50.4/ 32.7
Ostracoda	5.3/ 7.5	1.4/ 2.5	0.7/ 1.1	20.6/ 16.3
Halacarida	0.7/ 1.4	0.2/ 0.7	0.6/ 1.1	4.2/ 4.1
Kinorhyncha	12.2/ 12.7	1.0/ 1.4	0.1/ 0.3	0.2/ 0.4
Priapulida	0.6/ 0.9	0.2/ 0.6	0.0/ 0.0	0.0/ 0.0
Entoprocta	0.2/ 1.3	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Hill$_0$ (taxon richness)	6.6 / 1.1	6.2 / 1.3	7.4 / 1.0	10.8 / 0.4
Hill$_1$ diversity	1.21/ 0.17	1.17/ 0.13	1.63/ 0.39	2.35/ 0.39
Hill$_2$ "	1.09/ 0.10	1.06/ 0.06	1.29/ 0.22	1.65/ 0.26
Hill$_\infty$ "	1.05/ 0.05	1.03/ 0.03	1.14/ 0.11	1.31/ 0.13
N/C ratio	89.5 /133.5	165.2 /364.4	95.2 /139.6	8.7 / 4.9

Table 7. Systematics of the macrobenthos found in the MILZON-BENTHOS II area 1991 (dominant taxa are underlined).

Phylum Cnidaria

- Class Hydrozoa
- Class Anthozoa

Phylum Plathyhelminthes

Phylum Nemertinae

Phylum Mollusca

- Class Bivalvia
- Class Gastropoda

Phylum Sipunculida

Phylum Annelida

- Class Polychaeta
  - Order Errantia
  - Order Sedentaria
- Class Oligochaeta

Phylum Arthropoda

- Subphylum Crustacea
  - Class Malacostraca
    - Order Decapoda
    - Order Mysidacea
    - Order Cumacea
    - Order Tanaidacea
    - Order Isopoda
    - Order Amphipoda

Phylum Tentaculata

- Class Phoronida

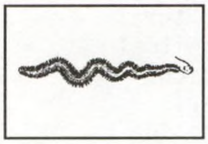
Phylum Echinodermata

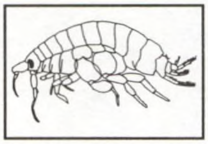
- Class Echinoidea
- Class Asteroidea
- Class Ophiuroidea
- Class Holothurioidea

Phylum Acrania

- Family Branchiostoma

Symbols:





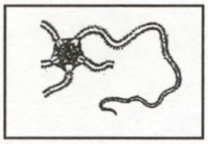


Table 8a. List of macrobenthic species (with shortening) found in the MILZON-BENTHOS II area 1991 and the number (n, %) of locations were the species have been found.

I. **POLYCHAETA :** (73 species) (39 % of the total species)

Anaitides groenlandica	(ANAIGROE)	1	(1 %)
Anaitides mucosa	(ANAIMUCO)	6	(7 %)
Anaitides maculata	(ANAIMACU)	1	(1 %)
Anaitides rosea	(ANAIROSE)	1	(1 %)
Aonides paucibranchiata	(AONIPAUC)	10	(11 %)
Aphrodite aculeta	(APHRACUL)	1	(1 %)
Aricidae minuta	(ARICMINU)	3	(3 %)
Chaetozone setosa	(CHAESETO)	42	(49 %)
Chaetopterus variopedatus	(CHAEVARI)	33	(38 %)
Cirratulidae spec.	(CIRRATUL)	1	(1 %)
Diplocirrus glaucus	(DIPLGLAU)	26	(30 %)
Eteone flava	(ETEOFLAV)	2	(2 %)
Eteone foliosa	(ETEOFOLI)	1	(1 %)
Eteone longa	(ETEOLONG)	2	(2 %)
Eumida sanguinea	(EUMISANG)	2	(2 %)
Exogone hebes	(EXOGHEBE)	3	(3 %)
Exogone naidina	(EXOGNAID)	1	(1 %)
Gattyana cirrosa	(GATTCIRR)	37	(43 %)
Glycera alba	(GLYCALBA)	1	(1 %)
Glycera rouxii	(GLYCROUX)	21	(24 %)
Glycinde nordmanni	(GLYCNORD)	7	(8 %)
Goniada maculata	(GONIMACU)	32	(37 %)
Gyptis capensis	(GYPTCAPE)	20	(23 %)
Harmothoe antilopes	(HARMANTI)	1	(1 %)
Harmothoe longisetis	(HARMLONG)	16	(18 %)
Harmothoe lunulata	(HARMLUNU)	4	(4 %)
Harmothoe spec.	(HARMSPEC)	5	(5 %)
Lanice conchilega	(LANICONC)	42	(49 %)
Laonice cirrata	(LAONCIRR)	1	(1 %)
Lumbrineris latreilli	(LUMBLATR)	34	(40 %)
Lumbrineris pseudophagilis	(LUMBPSEU)	2	(2 %)
Lysilla loveni	(LYSILOVE)	1	(1 %)
Magelona alleni	(MAGEALLE)	5	(5 %)
Magelona papillicornis	(MAGEPAPI)	52	(61 %)
Nephtys caeca	(NEPHCAEC)	2	(2 %)
Nephtys cirrosa	(NEPHCIRR)	33	(38 %)
Nephtys hombergii	(NEPHHOMB)	44	(51 %)
Nephtys incisa	(NEPHINCI)	2	(2 %)
Nephtys longisetosa	(NEPHLONG)	4	(4 %)
Nephtys spec.	(NEPHSPEC)	9	(10 %)
Nereis longissima	(NERELONG)	17	(20 %)
Nereis pelagica	(NEREPELA)	1	(1 %)
Notomastus latericeus	(NOTOLATE)	22	(25 %)
Ophelina acuminata	(OPHEACUM)	12	(14 %)
Ophelia limacina	(OPHELIMA)	5	(5 %)
Ophiodromus flexuosus	(OPHIFLEX)	29	(34 %)
Orbinia sertulata	(ORBISERT)	1	(1 %)
Owenia fusiformis	(OWENFUSI)	23	(27 %)
Paraonis gracilis	(PARAGRAC)	10	(11 %)
Pectinaria auricoma	(PECTAURI)	22	(25 %)
Pectinaria koreni	(PECTKORE)	31	(36 %)
Pholoe minuta	(PHOLMINU)	52	(61 %)
Pisione remota	(PISIREMO)	1	(1 %)
Poecilochaetus serpens	(POECSERP)	7	(8 %)
Polydora spec.	(POLYSPEC)	10	(11 %)
Polynoë kinbergi	(POLYKINB)	1	(1 %)
Polyphysia crassa	(POLYCRAS)	1	(1 %)
Prionospio cirrifera	(PRIOCIRR)	2	(2 %)
Protodorvillea kefersteini	(PROTKEFE)	1	(1 %)
Rhodine gracilior	(RHODGRAC)	1	(1 %)
Scalibregma inflatum	(SCALINFL)	11	(12 %)
Scoloplos armiger	(SCOLARMI)	23	(27 %)
Scolelepis bonnieri	(SCOLBONN)	4	(4 %)
Sigalion mathildae	(SIGAMATH)	22	(25 %)
Sosane gracilis	(SOSAGRAC)	1	(1 %)
Spio filicornis	(SPIOFILI)	20	(23 %)
Spio armata	(SPIOARMA)	1	(1 %)
Spiophanes bombyx	(SPIOBOMB)	63	(74 %)
Spiophanes kröyeri	(SPIOKROY)	3	(3 %)
Sthenelais limicola	(STHELIMI)	25	(29 %)
Syllidae spe.	(SYLLIDAE)	1	(1 %)
Synelmis klatti	(SYNEKLAT)	30	(35 %)
Terebellides stroemi	(TERESTRO)	2	(2 %)

II. **MOLLUSCA :** (43 species) (23 % of the total species)

Abra alba	(ABRAALBA)	19	(22 %)
Abra nitida	(ABRANITI)	1	(1 %)
Abra prismatica	(ABRAPRIS)	1	(1 %)
Abra spec.	(ABRASPEC)	3	(3 %)
Cardium edule	(CARDEDUL)	2	(2 %)
Chaetoderma spec.	(CHAETODE)	5	(5 %)
Cingula vitrea	(CINGVITR)	1	(1 %)
Cochlodesma praetenue	(COCHPRAE)	2	(2 %)
Corbula gibba	(CORBGIBB)	21	(24 %)
Cultellus pellucidus	(CULTPELL)	18	(21 %)
Cylichna cylindracea	(CYLICYLI)	12	(14 %)
Devonia perrieri	(DEVOPERR)	1	(1 %)
Donax vittatus	(DONAVITT)	8	(9 %)
Dosinia exoleta	(DOSIEXOL)	2	(2 %)
Dosinia lupinus	(DOSILUPI)	4	(4 %)
Ensis arcuatus	(ENSIARCU)	4	(4 %)
Ensis spec.	(ENSISPEC)	4	(4 %)
Gari fervensis	(GARIFERV)	1	(1 %)
Kellia suborbicularis	(KELLSUBO)	1	(1 %)
Lepton squamosum	(LEPTSQUA)	6	(7 %)
Mactra corallina	(MACTCORA)	1	(1 %)
Montacuta ferruginosa	(MONTFERR)	23	(27 %)
Musculus discor	(MUSCDISC)	1	(1 %)
Musculus niger	(MUSCNIGE)	1	(1 %)
Mya truncata	(MYA TRUN)	2	(2 %)
Mysella bidentata	(MYSEBIDE)	48	(56 %)
Mysia undata	(MYSIUNDA)	3	(3 %)
Natica alderi	(NATIALDE)	20	(23 %)
Natica catena	(NATICATE)	1	(1 %)
Nucula tenuis	(NUCUTENU)	6	(7 %)
Nucula turgida	(NUCUTURG)	16	(18 %)
Nucula spec.	(NUCUSPEC)	2	(2 %)
Retusa obtusa	(RETUOBTU)	1	(1 %)
Spisula elliptica	(SPISELLI)	6	(7 %)
Spisula subtruncata	(SPISSUBT)	2	(2 %)
Spisula spec.	(SPISSPEC)	12	(14 %)
Tellina fabula	(TELLFABU)	33	(38 %)
Tellina pygmaea	(TELLPYGM)	1	(1 %)
Thrasia convexa	(THRACONV)	6	(7 %)
Thrasia phaseolina	(THRAPHAS)	7	(8 %)
Thyasira flexuosa	(THYAFLEX)	5	(5 %)
Venus striatula	(VENUSTRI)	8	(9 %)
Venus spec.	(VENUSPEC)	1	(1 %)

Table 8b. List of macrobenthic species (with shortening) found in the MILZON-BENTHOS II area 1991 and the number (n, %) of locations were the species have been found.

III. **CRUSTACEA :** (52 species) (27 % of the total species)

Acidostoma sarsi	(ACIDSARS)	1	(1 %)	Harpinia antennaria	(HARPANTE)	44	(51 %)
Ampelisca diadema	(AMPEDIAD)	1	(1 %)	Harpinia pectinata	(HARPPECT)	6	(7 %)
Ampelisca tenuicornis	(AMPETENU)	16	(18 %)	Hippomedon denticulatus	(HIPPDENT)	6	(7 %)
Amphilochus neapolitanus	(AMPHNEAP)	1	(1 %)	Ione thoracica	(IONETHOR)	3	(3 %)
Apherusa ovalipes	(APHEOVAL)	1	(1 %)	Iphinoë trispinosa	(IPHITRIS)	1	(1 %)
Argissa hamatipes	(ARGIHAMA)	16	(18 %)	Isopoda spec.	(ISOPODA)	2	(2 %)
Atylus falcatus	(ATYLFALC)	2	(2 %)	Leucothoe incisa	(LEUCINCI)	4	(4 %)
Atylus swammerdami	(ATYLSWAM)	2	(2 %)	Liocarcinus pusillus	(LIOCPUSI)	1	(1 %)
Bathyporeia elegans	(BATHELEG)	18	(21 %)	Megaluropus agilis	(MEGAAGIL)	9	(10 %)
Bathyporeia guilliamsoniana	(BATHGUIL)	9	(10 %)	Melita obtusata	(MELIOBTU)	2	(2 %)
Bathyporeia pelagica	(BATHPELA)	4	(4 %)	Microdeutopus spec.	(MICRODEU)	1	(1 %)
Bathyporeia tenuipes	(BATHTENU)	20	(23 %)	Orchomene humulis	(ORCHHUMI)	1	(1 %)
Bathyporeia spec.	(BATHSPEC)	1	(1 %)	Ostracoda spec.	(OSTRACOD)	1	(1 %)
Callianassa subterranea	(CALLSUBT)	58	(68 %)	Paramphilochoides odontonyx	(PARAODON)	1	(1 %)
Caprellidae spec.	(CAPRSPEC)	2	(2 %)	Perioculodes longimanus	(PERILONG)	19	(22 %)
Cirolana borealis	(CIROBORE)	1	(1 %)	Pontocrates altamarinus	(PONTALTA)	6	(7 %)
Corystes cassivelaunus	(CORYCASS)	6	(7 %)	Processa edulis	(PROCEDUL)	1	(1 %)
Cumacea spec.	(CUMASPEC)	1	(1 %)	Processa nouveli	(PROCNOUV)	1	(1 %)
Diastylis bradyi	(DIASBRAD)	10	(11 %)	Pseudocuma longicornis	(PSEULONG)	11	(12 %)
Diastylis rathkei	(DIASRATH)	10	(11 %)	Pseudocuma similis	(PSEUSIMI)	3	(3 %)
Dyopedos monacanthus	(DYOPMONA)	1	(1 %)	Schistomysis kervellei	(SCHIKERV)	1	(1 %)
Ebalia cranchii	(EBALCRAN)	1	(1 %)	Synchelidium maculatum	(SYNCMACU)	5	(5 %)
Eudorellopsis deformis	(EUDODEFO)	5	(5 %)	Thia scutellata	(THIASCUT)	3	(3 %)
Eudorella emarginata	(EUDOEMAR)	2	(2 %)	Upogebia deltaura	(UPOGDELT)	9	(10 %)
Eudorella truncatula	(EUDOTRUN)	14	(16 %)	Urothoe elegans	(UROTELEG)	5	(5 %)
Gastrosaccus spinifer	(GASTSPIN)	2	(2 %)	Urothoe poseidonis	(UROTPOSE)	9	(10 %)

IV. **ECHINODERMATA :** (12 species) (6 % of the total species)

Acrocnida brachiata	(ACROBRAC)	1	(1 %)
Amphiura filiformis	(AMPHFILI)	63	(74 %)
Asterias rubens	(ASTERUBE)	6	(7 %)
Brissopsis lyrifera	(BRISLYRI)	2	(2 %)
Cucumaria elongata	(CUCUELON)	1	(1 %)
Echinocardium cordatum	(ECHICORD)	37	(43 %)
Echinocyamus pusillus	(ECHIPUSI)	7	(8 %)
Labidoplax bustei	(LABIBUSK)	1	(1 %)
Leptosynapta inhaerens	(LEPTINHA)	6	(7 %)
Ophiura albida	(OPHIALBI)	12	(14 %)
Ophiura texturata	(OPHITEXT)	10	(11 %)
Ophiura spec.	(OPHISPEC)	4	(4 %)

V. **REST :** (10 taxa) (5 % of the total species)

Anthozoa spec.	(ANTHOZOA)	26	(30 %)
Ascidiacea spec.	(ASCIDIAC)	1	(1 %)
Branchiostoma lanceolatum	(BRANLANC)	4	(4 %)
Echiurida spec.	(ECHIURID)	1	(1 %)
Hydrozoa spec.	(HYDROZOA)	7	(8 %)
Nemertinae spec.	(NEMERTIN)	59	(69 %)
Oligochaeta spec.	(OLIGOCHA)	1	(1 %)
Phoronida spec.	(PHORONID)	51	(60 %)
Plathyhelminthes spec.	(PLATHYHE)	12	(14 %)
Sipunculida spec.	(SIPUNCUL)	26	(30 %)

VI. **TOTAL NUMBER OF SPECIES :** 190

Table 9. Presence (number and percentage of stations) of the 20 most abundant macrobenthos species, found at more than 35 % of the stations in the MILZON-BENTHOS II area 1991. The mean values of density (ind./m²) and biomass (g AFDW/m²) are given with their standard deviation. Abundance patterns are shown in indicated maps.

species	Number of the Fig.	presence n	presence %	density (ind./m²) mean	density (ind./m²) st.dev.	biomass (g AFDW/m²) mean	biomass (g AFDW/m²) st.dev.
Spiophanes bombyx	63	63	74	924.10	2576.30	0.27634	0.85555
Amphiura filiformis	72	62	72	486.40	701.00	2.39102	4.09467
Callianassa subterranea	70	58	68	65.40	72.89	2.02732	3.05511
Nemertinae	75	58	68	52.84	135.47	0.07559	0.23556
Magelona papillicornis	57	52	61	232.88	575.68	0.43839	1.27334
Pholoe minuta	61	52	61	45.09	82.33	0.01506	0.03021
Phoronida	76	50	58	62.65	135.76	0.02319	0.04522
Mysella bidentata	66	47	55	228.23	457.25	0.03852	0.06536
Harpinia antennaria	71	44	51	32.70	44.39	0.00937	0.01344
Nephtys hombergii	59	44	51	17.90	23.72	0.42850	0.99307
Chaetozone setosa	51	42	49	26.33	48.72	0.01701	0.04494
Lanice conchilega	55	42	49	55.59	122.20	0.05975	0.22017
Gattyana cirrosa	53	37	43	22.55	53.06	0.23273	0.56033
Echinocardium cordatum	73	36	42	12.74	22.21	2.29725	4.37313
Lumbrineris latreilli	56	34	40	42.00	81.01	0.09458	0.34602
Chaetopterus variopedatus	52	33	38	24.61	61.87	3.04706	6.38749
Nephtys cirrosa	58	33	38	20.48	36.13	0.07635	0.24825
Goniada maculata	54	32	37	14.11	45.79	0.02213	0.05704
Tellina fabula	68	32	37	67.30	134.11	0.06882	0.21355
Pectinaria koreni	60	31	36	24.61	53.00	0.00995	0.04258

Table 10. Presence (number and percentage of stations), minimum, maximum, mean value with standard deviation and percentage of the mean of some taxonomic macrobenthic groups in the MILZON-BENTHOS II area 1991.

	presence n	presence %	min.	max.	mean	st.dev.	% of mean
Sum density (ind. /m²)			321.9	22135.2	3153.5	2797.8	
Density:							
Polychaeta	85	100	160.93	21623.14	1656.11	2618.24	52.52
Crustacea	85	100	14.63	424.27	186.40	97.02	5.91
Mollusca	82	96	0.00	4798.64	587.95	815.12	18.64
Echinodermata	82	96	0.00	3701.39	563.51	713.18	17.87
Ascidiacea	1	1	0.00	14.63	0.17	1.58	0.01
Branchiostoma	4	4	0.00	58.52	1.37	7.35	0.04
Cnidaria	30	35	0.00	146.30	13.25	26.29	0.42
Nemertinae	59	69	0.00	1111.88	53.35	135.34	1.69
Phoronida	51	60	0.00	1024.10	64.88	136.28	2.06
Plathyhelminthes	12	14	0.00	29.26	2.58	6.84	0.08
Sipunculida	26	30	0.00	409.64	23.92	63.80	0.76
							100.00
Sum biomass (g AFDW/m²)			0.9	110.8	18.2	17.4	
Biomass :							
Polychaeta	85	100	0.0	40.8	5.47	6.93	30.12
Crustacea	85	100	0.0	18.8	2.46	3.52	13.55
Mollusca	82	96	0.0	99.9	4.86	14.25	26.76
Echinodermata	82	96	0.0	25.6	5.02	6.26	27.64
Ascidiacea	1	1	0.0	3.1	0.04	0.33	0.22
Branchiostoma	4	4	0.0	0.6	0.01	0.08	0.06
Cnidaria	30	35	0.0	1.7	0.06	0.23	0.33
Nemertinae	59	69	0.0	1.9	0.08	0.24	0.44
Phoronida	51	60	0.0	0.3	0.02	0.05	0.11
Plathyhelminthes	12	14	0.0	0.5	0.00	0.05	0.00
Sipunculida	26	30	0.0	2.4	0.14	0.41	0.77
							100.00
$Hill_0$ (number of species)			9.0	35.0	23.4	5.5	
$Hill_1$			1.3	21.6	8.8	4.4	
$Hill_2$			1.1	17.8	5.5	3.6	
$Hill_y$			1.0	7.1	3.0	1.6	

Table 11. Average values of abiotic and macrobenthic parameters of each macrobenthic TWINSPAN cluster, as shown in Figs. 45 and 46, with their standard deviation.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Symbols	[✳]	[●]	[◀]	[◇]
Number of locations	31	19	29	6
	mean/st.d.	mean/st.d.	mean/st.d.	mean/st.d.
<u>Abiotic parameters :</u>				
Depth (m)	42.9 / 4.9	45.0 / 3.1	31.7 / 3.8	30.0 / 2.4
Median grain size (μm)	125.3 / 22.4	134.1 / 28.8	215.1 / 35.7	381.0 / 97.4
Mud content (%)	17.49/ 6.9	9.54/ 4.1	4.19/ 4.1	0.42/ 0.2
Chl.a content (μg/g)	2.41/ 2.9	0.62/ 0.5	1.00/ 1.4	0.36/ 0.3
POC content (% C)	0.68/ 0.5	0.35/ 0.2	0.28/ 0.2	0.10/ 0.2
<u>Macrobenthos :</u>				
Total number of species	117	118	107	48
Density (ind./m^2)	2567.8/1962.7	2701.9/1228.9	4528.2/3859.6	965.6/ 876.6
Biomass (g AFDW/m^2)	23.6/ 13.1	12.4/ 9.6	18.8/ 23.7	5.2/ 9.1
Polychaeta (ind./m^2)	832.0/ 890.4	581.4/ 206.5	3452.2/3810.9	636.4/ 07.9
Crustacea (")	206.2/ 90.2	226.4/ 87.9	152.9/ 96.4	119.5/ 95.0
Mollusca (")	584.7/1051.6	840.1/ 668.6	539.4/ 641.2	41.7/ 38.6
Echinodermata (")	612.5/ 708.8	894.7/ 575.3	14.5/ 29.2	9.2/ 19.6
Polychaeta (g AFDW/m^2)	9.98/ 9.33	2.24/ 2.64	3.75/ 2.95	0.75/ 0.54
Crustacea (")	4.80/ 4.34	1.87/ 1.83	0.84/ 2.12	0.06/ 0.04
Mollusca (")	1.62/ 3.66	2.21/ 6.14	10.34/ 22.55	3.93/ 9.50
Echinodermata(")	6.57/ 7.03	5.95/ 5.47	3.76/ 5.96	0.21/ 0.43
Hill$_0$ (species richness)	24.35/ 3.55	27.32/ 4.87	21.34/ 5.11	15.67/ 6.89
Hill$_1$ diversity	10.53/ 4.72	10.15/ 4.04	5.81/ 3.08	9.60/ 1.80
Hill$_2$ "	6.89/ 4.22	5.93/ 3.23	3.49/ 2.15	7.12/ 1.50
Hill$_\infty$ "	3.51/ 1.81	3.19/ 1.37	2.14/ 1.07	3.72/ 0.95

Table 12. List of abundant macrobenthos species in each macrobenthic TWINSPAN cluster of the MILZON-BENTHOS II area 1991. The presence (number and percentage of stations) and mean values with the standard deviation of density (ind./m²) and biomass (g AFDW/m²) (cf. Fig. 46).

species	presence n	presence %	density mean	density st.dev.	biomass mean	biomass st.dev.
Cluster 1 ✳						
Amphiura filiformis	31	100	790.0	869.3	3.89	5.61
Callianassa subterrena	31	100	125.5	74.9	3.73	3.82
Lumbrineris latreilli	30	96	103.8	101.3	0.15	0.14
Chaetopterus variopedatus	27	87	63.7	90.3	7.78	8.66
Pholoe minuta	27	87	69.9	112.3	0.02	0.04
Cluster 2 ●						
Amphiura filiformis	19	100	874.7	556.2	4.01	2.89
Harpinia antennaria	18	94	77.8	49.5	0.02	0.02
Mysella bidentata	18	94	659.9	660.0	0.10	0.08
Pholoe minuta	18	94	74.7	68.1	0.02	0.02
Phoronida	18	94	85.5	85.1	0.02	0.03
Callianassa subterrena	17	89	60.1	48.3	1.76	1.83
Cluster 3 ◀						
Spiophanes bombyx	29	100	2448.8	3963.8	0.76	1.34
Magelona papilicornis	28	96	628.1	861.8	1.25	1.96
Nemertinae	26	89	119.6	216.9	0.09	0.16
Tellina fabula	26	89	186.2	176.1	0.20	0.33
Lanice concilega	23	79	135.2	176.3	0.15	0.35
Cluster 4 ◇						
Nemertinae	6	100	31.7	17.1	0.03	0.03
Nephtys cirrosa	6	100	70.7	46.6	0.06	0.03
Spiophanes bombyx	6	100	131.7	85.3	0.03	0.02
Echinocyamus pusillus	5	83	48.8	35.4	0.01	0.01

Table 13. Correlations between the abiotic parameters, log(x+1) transformed, found in the MILZON-BENTHOS II area 1991.
(n=85, α=0.001, r=0.347, 95 % reliability) *=significant

	abiotic parameters Depth	Median	Mud	Chl.a	POC
Depth	1.00				
Median gr.size	-0.82*	1.00			
Mud content	0.70*	-0.83*	1.00		
Chl.a content	0.07	-0.31	0.54*	1.00	
POC content	0.34	-0.44*	0.73*	0.71*	1.00

Table 14. Correlations between the meiobenthos and the abiotic parameters, log (x+1) transformed, found in the MILZON-BENTHOS II area 1991.
(n=85, α = 0.001, r=0.347, 95 % reliability) *=significant

	Total	Nem.	Cop.	Gastr.	Turb.	Arch.	Oligo.	Poly.	Hydr.	Tard.	Ostr.	Halac.	Kinor.	Priap.
Total	1.00													
Nematoda	0.99*	1.00												
Copepoda	0.15	0.05	1.00											
Gastrotricha	-0.11	-0.19	0.23	1.00										
Turbellaria	-0.25	-0.29	0.03	0.48*	1.00									
Archiannelida	-0.04	-0.12	0.35*	0.54*	0.29	1.00								
Oligochaeta	0.01	-0.07	0.44	0.47*	0.28	0.61*	1.00							
Polychaeta	-0.09	-0.15	0.37*	0.38*	0.26	0.35	0.31	1.00						
Hydrozoa	-0.01	-0.09	0.37*	0.68*	0.48*	0.40*	0.41*	0.31	1.00					
Tardigrada	-0.06	-0.12	0.22	0.68*	0.43*	0.39*	0.53*	0.24	0.45*	1.00				
Ostracoda	0.10	0.06	0.33	0.11	-0.17	0.37*	0.30	0.27	0.21	0.14	1.00			
Halacarida	0.25	0.19	0.37*	0.31	0.13	0.44*	0.41*	0.18	0.43*	0.24	0.24	1.00		
Kinorhyncha	0.46*	0.46*	0.25	-0.45*	-0.43*	-0.20	-0.19	-0.11	-0.24	-0.45*	0.07	0.10	1.00	
Priapulida	0.10	0.11	0.04	-0.25	-0.28	-0.15	-0.13	-0.03	-0.11	-0.26	0.18	-0.01	0.37*	1.00
Depth	0.12	0.17	-0.06	-0.67*	-0.56*	-0.42*	-0.31	-0.12	-0.49*	-0.46*	0.35	-0.18	0.34	0.32
Median gr.size	-0.18	-0.24	0.10	0.72*	0.52*	0.54*	0.46*	0.12	0.47*	0.67*	-0.20	0.34	-0.49*	-0.36*
Mud content	0.27	0.33	-0.02	-0.76*	-0.58*	-0.49*	-0.42*	-0.25	-0.46*	-0.71*	-0.03	-0.17	0.65*	0.38*
Chl.a content	0.21	0.21	0.18	-0.34	-0.20	-0.18	-0.09	-0.09	-0.20	-0.38*	-0.12	0.04	0.64*	0.17
POC content	0.26	0.29	0.13	-0.57*	-0.39*	-0.29	-0.27	-0.16	-0.39*	-0.59*	-0.15	0.10	0.75*	0.38*
Taxa	0.22	0.14	0.40*	0.52*	0.24	0.47*	0.51*	0.53*	0.47*	0.47*	0.49*	0.51*	0.05	0.16
$Hill_1$	-0.34	-0.45*	0.65*	0.70*	0.46*	0.63*	0.56*	0.52*	0.69*	0.54*	0.33	0.40*	-0.25	-0.10
$Hill_2$	-0.30	-0.42*	0.66*	0.67*	0.42*	0.61*	0.54*	0.49*	0.69*	0.50*	0.32	0.40*	-0.23	-0.10
$Hill_\infty$	-0.30	-0.41*	0.67*	0.65*	0.41*	0.60*	0.54*	0.48*	0.68*	0.50*	0.32	0.41*	-0.23	-0.11
N/C ratio	0.47*	0.55*	-0.73*	-0.29	-0.19	-0.36*	-0.39*	-0.39*	-0.35*	-0.25	-0.24	-0.19	0.06	0.03

	Taxa	$Hill_1$	$Hill_2$	$Hill_\infty$	N/C
Depth	-0.14	-0.46*	-0.44*	-0.43*	0.13
Median gr.size	0.26	0.53*	0.50*	0.49*	-0.22
Mud content	-0.31	-0.55*	-0.51*	-0.50*	0.20
Chl.a content	-0.10	-0.12	-0.09	-0.08	-0.03
POC content	-0.17	-0.34	-0.32	-0.31	0.06

Table 15. Correlations between the macrobenthos and the abiotic parameters, log(x+1) transformed, found in the MILZON BENTHOS area 1991. (n = 85, α = 0.001, r = 0.347, 95 % reliability) * = significant

	Density (ind./m²)					Biomass (g AFDW/m²)					diversity			
	total	Poly.	Crus.	Moll.	Echi.	total	Poly.	Crus.	Moll.	Echi.	Spec.	$Hill_1$	$Hill_2$	$Hill_\infty$
total density	1.00													
Polychaeta "	0.76*	1.00												
Crustacea "	0.10	-0.17	1.00											
Mollusca "	0.61*	0.19	0.14	1.00										
Echinoderm. "	0.03	-0.47*	0.44*	0.23	1.00									
total biomass	0.20	0.15	0.07	-0.04	0.26	1.00								
Polychaeta "	0.04	0.15	-0.02	-0.31	0.12	0.62*	1.00							
Crustacea "	-0.07	-0.19	0.33	-0.08	0.47*	0.50*	0.30	1.00						
Mollusca "	0.22	0.30	-0.06	0.17	-0.21	0.47*	-0.04	-0.11	1.00					
Echinoderm. "	0.26	-0.05	0.21	0.29	0.48*	0.52*	0.18	0.41*	-0.03	1.00				
Species number	0.46*	0.10	0.31	0.47*	0.60*	0.22	0.15	0.26	-0.06	0.34	1.00			
$Hill_1$	-0.67*	-0.64*	0.15	-0.30	0.36*	0.01	0.14	0.32	-0.22	-0.06	0.26	1.00		
$Hill_2$	-0.72*	-0.60*	0.08	-0.40*	0.19	-0.01	0.14	0.28	-0.21	-0.12	0.08	0.95*	1.00	
$Hill_\infty$	-0.68*	-0.57*	0.06	-0.38*	0.12	-0.04	0.12	0.23	-0.19	-0.15	0.02	0.88*	0.97*	1.00
Depth	-0.12	-0.48*	0.31	0.05	0.85*	0.28	0.24	0.44*	-0.25	0.38*	0.54*	0.46*	0.32	0.25
Median gr.size	0.06	0.42*	-0.22	-0.10	-0.72*	-0.40*	-0.34	-0.40*	0.12	-0.41*	-0.50*	-0.38*	-0.26	-0.22
Mud content	-0.03	-0.36*	0.25	0.12	0.71*	0.41*	0.33	0.66*	-0.14	0.41*	0.49*	0.40*	0.27	0.20
Chl.a content	0.07	-0.08	0.00	0.25	0.17	0.22	0.21	0.34	0.07	0.15	0.15	0.06	0.05	0.06
POC content	0.04	-0.15	0.14	0.13	0.43*	-0.31	0.39*	0.48*	-0.14	0.28	0.41	0.27	0.18	0.13

Table 16. Correlations between the meio- and macrobenthos, log(x+1) transformed, found in the MILZON BENTHOS II area 1991. (n=85, α=0.001, r=0.347, 95 % reliability) *=significant

	Macrobenthos: Density (ind./m²)					Biomass (g AFDW/m²)								
	total	Poly.	Crus.	Moll.	Echi.	total	Poly.	Crus	Moll.	Echi.	Spec.	$Hill_1$	$Hill_2$	$Hill_\infty$
Meiobenthos :														
Total density	0.14	-0.05	0.19	0.21	0.25	0.10	-0.03	0.27	0.00	0.23	0.13	-0.03	-0.10	-0.13
Taxa	-0.18	-0.20	0.12	-0.13	-0.04	-0.26	-0.16	-0.28	-0.09	-0.21	-0.19	0.05	0.05	0.04
$Hill_1$	-0.36*	-0.19	-0.06	-0.29	-0.36*	-0.26	-0.20	-0.33	-0.00	-0.43*	-0.46*	-0.04	0.15	0.19
$Hill_2$	-0.39*	-0.23	-0.05	-0.29	-0.35*	-0.23	-0.17	-0.29	-0.01	-0.42*	-0.49*	-0.06	0.17	0.22
$Hill_\infty$	-0.40*	-0.24	-0.04	-0.28	-0.35*	-0.22	-0.16	-0.28	-0.01	-0.42*	-0.49*	-0.06	0.17	0.22
Nematoda	0.18	-0.02	0.19	0.24	0.29	0.12	-0.01	0.29	0.00	0.27	0.19	-0.02	-0.12	-0.15
Copepoda	-0.33	-0.35*	0.19	-0.09	-0.12	0.02	0.01	0.15	-0.14	-0.08	-0.16	0.09	0.29	0.32
Gastrotricha	-0.02	0.21	-0.13	-0.17	-0.57*	-0.40*	-0.32	-0.53*	0.07	-0.48*	-0.37*	-0.17	-0.18	-0.16
Turbellaria	0.08	0.27	-0.25	-0.05	-0.47*	-0.22	-0.24	-0.47*	0.21	-0.26	-0.24	-0.25	-0.23	-0.19
Archiannelida	-0.16	-0.03	-0.00	-0.20	-0.28	-0.20	-0.19	-0.15	0.07	-0.24	-0.19	0.13	0.17	0.16
Oligochaeta	-0.13	-0.09	-0.00	-0.13	-0.19	-0.34	-0.28	-0.24	-0.09	-0.29	-0.20	0.07	0.07	0.04
Polychaeta	-0.16	-0.16	-0.02	-0.08	-0.07	-0.19	-0.23	-0.41*	0.04	-0.19	-0.22	-0.05	0.04	0.05
Hydrozoa	-0.16	-0.02	-0.13	-0.24	-0.38*	-0.21	-0.29	-0.30	0.19	-0.33	-0.40*	-0.10	-0.07	-0.06
Tardigrada	-0.06	0.09	-0.06	-0.05	-0.35*	-0.42*	-0.39*	-0.40*	-0.07	-0.33	-0.34	-0.18	-0.20	-0.18
Ostracoda	-0.38*	-0.44*	0.11	-0.22	0.27	-0.01	-0.04	0.00	-0.09	-0.05	-0.06	0.27	0.38*	0.37
Halacarida	-0.16	-0.10	-0.01	-0.21	-0.03	0.02	0.09	0.01	0.05	-0.21	-0.18	0.02	0.11	0.09
Kinorhyncha	-0.14	-0.30	0.19	0.12	0.41*	0.38*	0.39*	0.44*	-0.05	0.30	0.11	0.05	0.17	0.16
Priapulida	-0.09	-0.20	-0.02	-0.07	0.28	-0.03	0.03	0.03	-0.10	0.13	0.16	0.22	0.09	-0.00

Table 17. Numbers of the ICES (1986) locations, compared with the MILZON-BENTHOS II (1991) locations (cf. Figs. 2 and 3).

ICES	MILZON-BENTHOS II	
Nr	Station	Nr
59	1-4	4
69	1-5	5
79	2-1	6
89	3-5	15
51	4-2	17
60	5-3	23
70	6-2	27
61	6-4	29
42	7-3	33
52	8-3	38
43	17-2	77
53	18-1	81

Figures

Figures :

I Abiotic parameters

1.(a) The investigated area of the MILZON-BENTHOS II project 1991.
1.(b) Survey area of the MILZON-BENTHOS I (1988-1989) and II (1991) projects.
2. Locations of EXP*BMN project 1991 in the study area of MILZON-BENTHOS II project 1991.
3. Locations of ICES (1986) and META stations (de Wilde et al. 1984) in the study area of the MILZON-BENTHOS II 1991 project.
4. Depth (m) recordings, uncorrected for differences due to the tidal cycle.
5. Median grain size (for the fraction 63 - 2000 μm) of the upper 10 cm of the sediment.
6. Mud content (fraction < 63 μm, %) of the upper 10 cm of the sediment.
7. Chlorophyll-a content (μg/g) of the upper 3 cm of the sediment.
8. POC content (% C) of the upper 3 cm of the sediment.

II Meiobenthos

9. Total number of meiobenthic taxa ($Hill_0$).
10. Diversity ($Hill_1$) of the meiobenthos.
11. Diversity ($Hill_2$) of the meiobenthos.
12. Diversity ($Hill_\infty$) of the meiobenthos.
13. Total density of the meiobenthos (ind./10 cm^2).
14. Spatial distribution of the Nematoda (ind./10 cm^2).
15.(a/b) Spatial distribution of the Copepoda (ind./10 cm^2).
16. Spatial distribution of the Nematoda/Copepoda (N/C) ratio.
17. Spatial distribution of the Gastrotricha (ind./10 cm^2).
18. Spatial distribution of the Turbellaria (ind./10 cm^2).
19. Spatial distribution of the Archiannelida (ind./10 cm^2).
20. Spatial distribution of the Oligochaeta (ind./10 cm^2).
21. Spatial distribution of the Polychaeta (< 1mm)(ind./10 cm^2).
22. Spatial distribution of the Hydrozoa (ind./10 cm^2).
23. Spatial distribution of the Tardigrada (ind./10 cm^2).
24. Spatial distribution of the Ostracoda (ind./10 cm^2).
25. Spatial distribution of the Halacarida (ind./10 cm^2).
26. Spatial distribution of the Kinorhyncha (ind./10 cm^2).
27. Spatial distribution of the Priapulida (ind./10 cm^2).
28. TWINSPAN clustering of the meiobenthos density (ind./10 cm^2).
29. TWINSPAN dichotomy of the meiobenthos density (ind./10 cm^2).
30.(a-c) Box and whisker plots of some average biotic and abiotic variables after TWINSPAN analysis using the data of the meiobenthos density (ind./10 cm^2).

III Macrobenthos

31. Total number of macrobenthic species ($Hill_0$).
32. Diversity ($Hill_1$) of the macrobenthos.
33. Diversity ($Hill_2$) of the macrobenthos.
34. Diversity ($Hill_\infty$) of the macrobenthos.
35. Total density of the macrobenthos (ind./m^2).
36. Spatial distribution of the Polychaeta density (ind./m^2).
37. Spatial distribution of the Mollusca density (ind./m^2).
38. Spatial distribution of the Crustacea density (ind./m^2).
39. Spatial distribution of the Echinodermata density (ind./m^2).
40. Total biomass of the macrobenthos (g AFDW/m^2).
41. Spatial distribution of the Polychaeta biomass (g AFDW/m^2).
42. Spatial distribution of the Mollusca biomass (g AFDW/m^2).
43. Spatial distribution of the Crustacea biomass (g AFDW/m^2).
44. Spatial distribution of the Echinodermata biomass (g AFDW/m^2).
45. TWINSPAN clustering of the macrobenthos density (ind./m^2).
46. TWINSPAN dichotomy of the macrobenthos density (ind./m^2).
47.(a-d) Box and whisker plots of some average biotic and abiotic variables after TWINSPAN analysis using the data of the macrobenthos density (ind./m^2).
48. TWINSPAN clustering of the macrobenthos biomass (g AFDW/m^2).
49. Spatial distribution (ind./m^2) of the Polychaeta Anaitides mucosa.

50. Spatial distribution (ind./m^2) of the Polychaeta Capitella capitata.
51. Spatial distribution (ind./m^2) of the Polychaeta Chaetozone setosa.
52. Spatial distribution (ind./m^2) of the Polychaeta Chaetopterus variopedatus.
53. Spatial distribution (ind./m^2) of the Polychaeta Gattyana cirrosa.
54. Spatial distribution (ind./m^2) of the Polychaeta Goniada maculata.
55. Spatial distribution (ind./m^2) of the Polychaeta Lanice conchilega.
56. Spatial distribution (ind./m^2) of the Polychaeta Lumbrineris latreilli.
57. Spatial distribution (ind./m^2) of the Polychaeta Magelona papillicornis.
58. Spatial distribution (ind./m^2) of the Polychaeta Nephtys cirrosa.
59. Spatial distribution (ind./m^2) of the Polychaeta Nephtys hombergii.
60. Spatial distribution (ind./m^2) of the Polychaeta Pectinaria koreni.
61. Spatial distribution (ind./m^2) of the Polychaeta Pholoe minuta.
62. Spatial distribution (ind./m^2) of the Polychaeta Scoloplos armiger.
63. Spatial distribution (ind./m^2) of the Polychaeta Spiophanes bombyx.
64. Spatial distribution (ind./m^2) of the Mollusca Abra alba.
65. Spatial distribution (ind./m^2) of the Mollusca Macoma baltica.
66. Spatial distribution (ind./m^2) of the Mollusca Spisula subtruncata.
67. Spatial distribution (ind./m^2) of the Mollusca Tellina fabula.
68. Spatial distribution (ind./m^2) of the Mollusca Mysella bidentata.
69. Spatial distribution (ind./m^2) of the Crustacea Bathyporeia elegans.
70. Spatial distribution (ind./m^2) of the Crustacea Callianassa subterranea.
71. Spatial distribution (ind./m^2) of the Crustacea Harpinia antennaria.
72. Spatial distribution (ind./m^2) of the Echinodermata Amphiura filiformis.
73. Spatial distribution (ind./m^2) of the Echinodermata Echinocardium cordatum.
74. Spatial distribution (ind./m^2) of the Echinodermata Echinocyamus pusillus.
75. Spatial distribution (ind./m^2) of the Nemertinae.
76. Spatial distribution (ind./m^2) of the Phoronida.
77. Spatial distribution (ind./m^2) of the Sipunculida.

IV Meio- and macrobenthos

78. Correlation between abiotic variables and TWINSPAN clusters of the meiobenthos density (ind./10 cm^2).
79. Correlation between abiotic variables and TWINSPAN clusters of the macrobenthos density (ind./m^2).
80. TWINSPAN clustering of the meiobenthos density (ind./10 cm^2) by including of the ICES data of 1986.
81. TWINSPAN clustering of the meiobenthos density (ind./10 cm^2) including the MILZON-BENTHOS data of 1988 and 1989.
82. TWINSPAN dichotomy of the meiobenthos density (ind./10 cm^2) including the MILZON-BENTHOS data of 1988 and 1989.
83.(a-e) Distribution of the total density (ind./10 cm^2), Nematoda, Copepoda, Gastrotricha and Turbellaria in the total study area of 1988, 1989 and 1991.
84. TWINSPAN clustering of the macrobenthos density (ind./m^2) including the MILZON-BENTHOS I data of 1988 and 1989.
85. TWINSPAN dichotomy of the macrobenthos density (ind./m^2) including the MILZON-BENTHOS I data of 1988 and 1989.
86. TWINSPAN clustering of the macrobenthos density (ind./m^2) including the ICES data of 1986.
87.(a/b) Comparing of the MILZON-BENTHOS II (1991) and the ICES (1986) data.

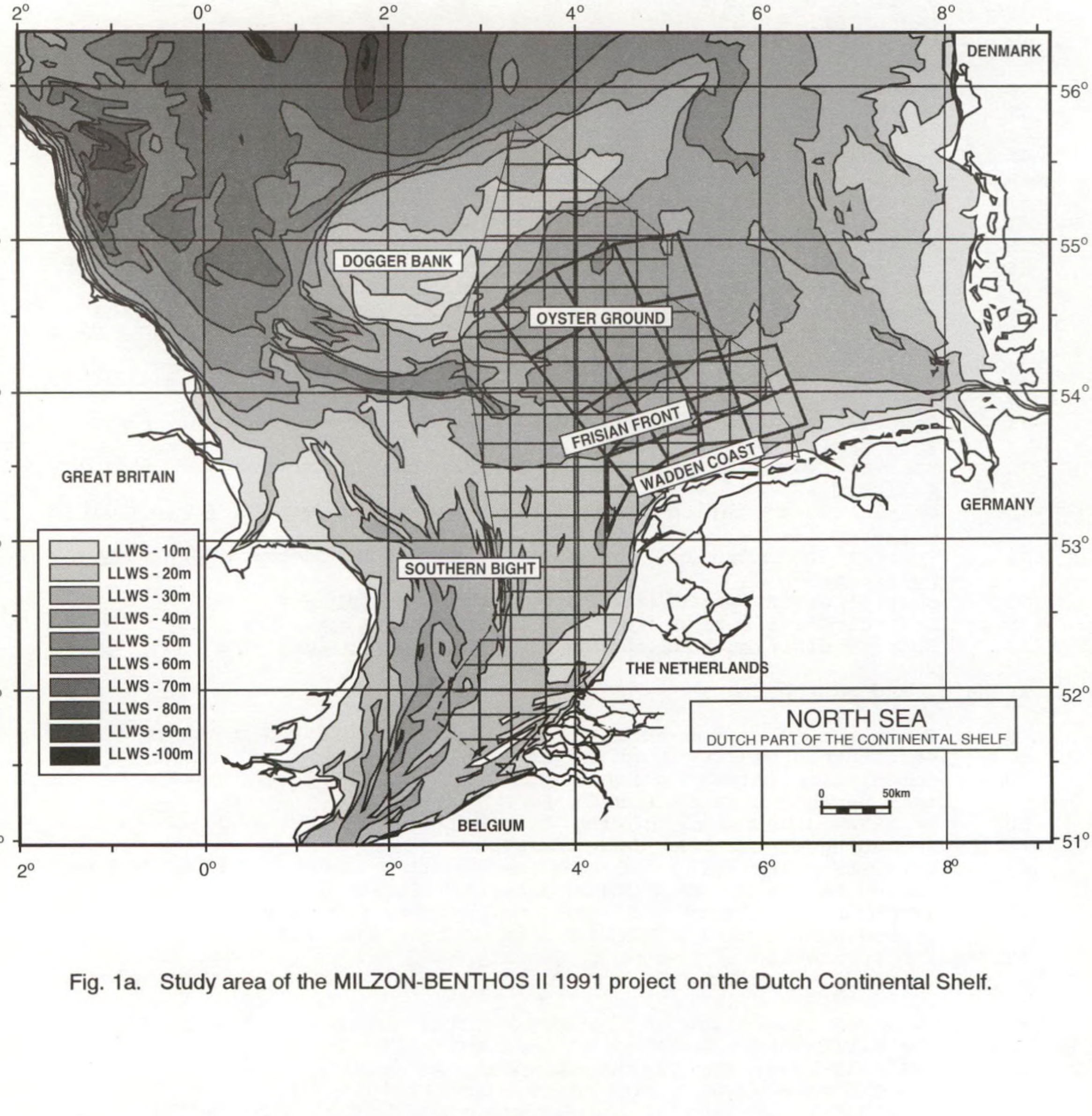


Fig. 1a. Study area of the MILZON-BENTHOS II 1991 project on the Dutch Continental Shelf.

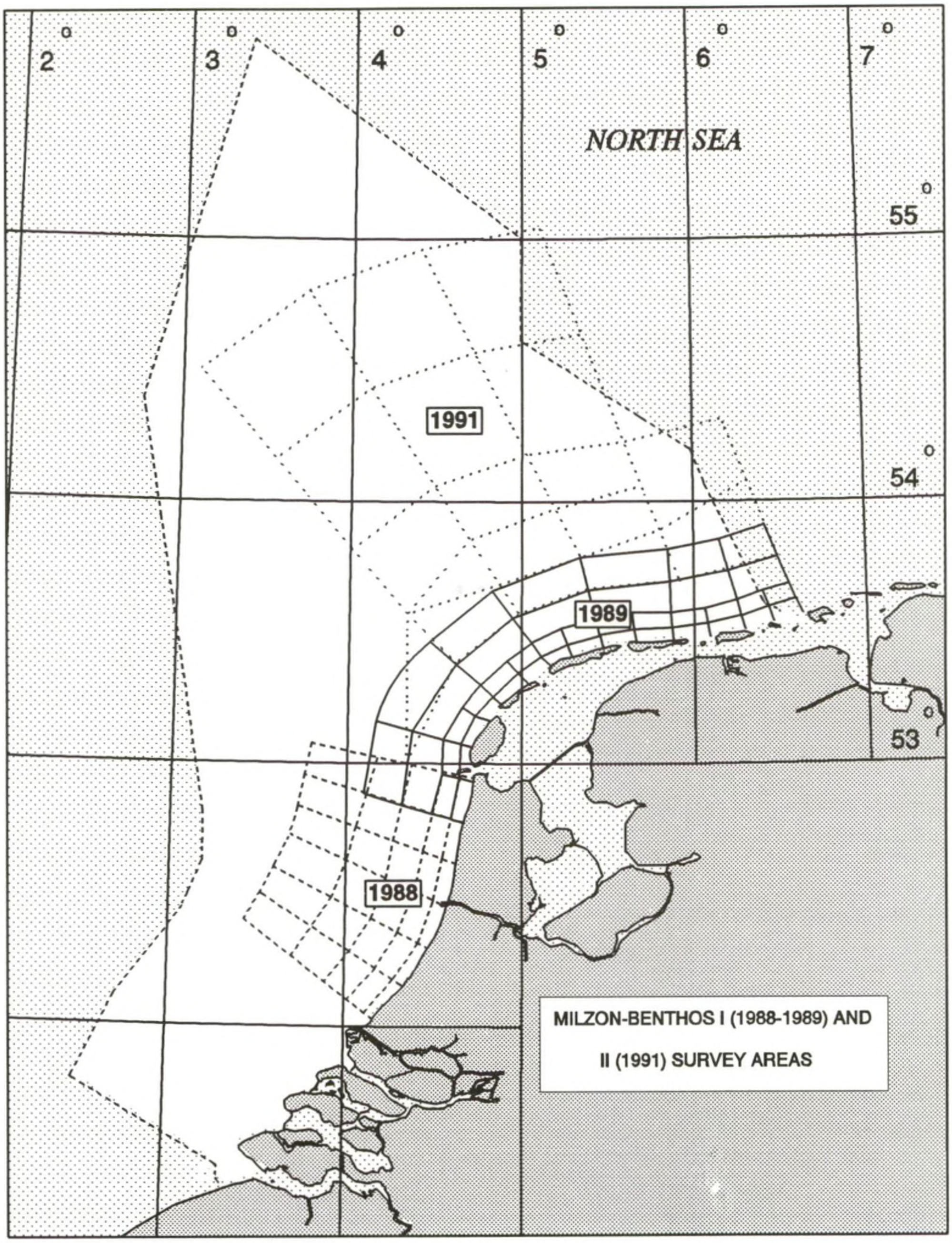


Fig. 1b. Survey area of the MILZON-BENTHOS I (1988-1989) and II (1991) projects.

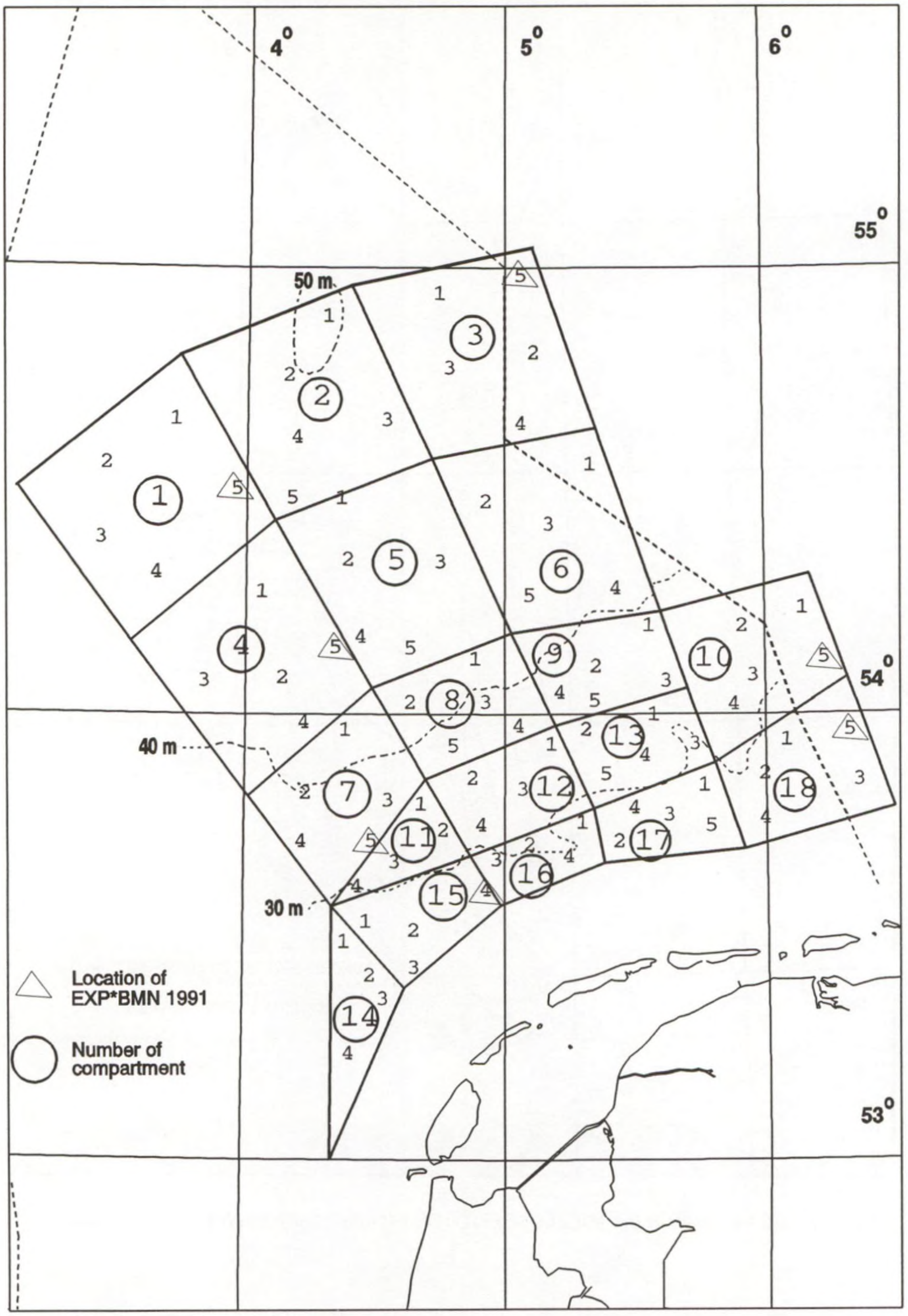


Fig. 2. Locations of the EXP*BMN 1991 project in the study area of MILZON-BENTHOS II 1991.(..... = isobaths of 30, 40 and 50 m).

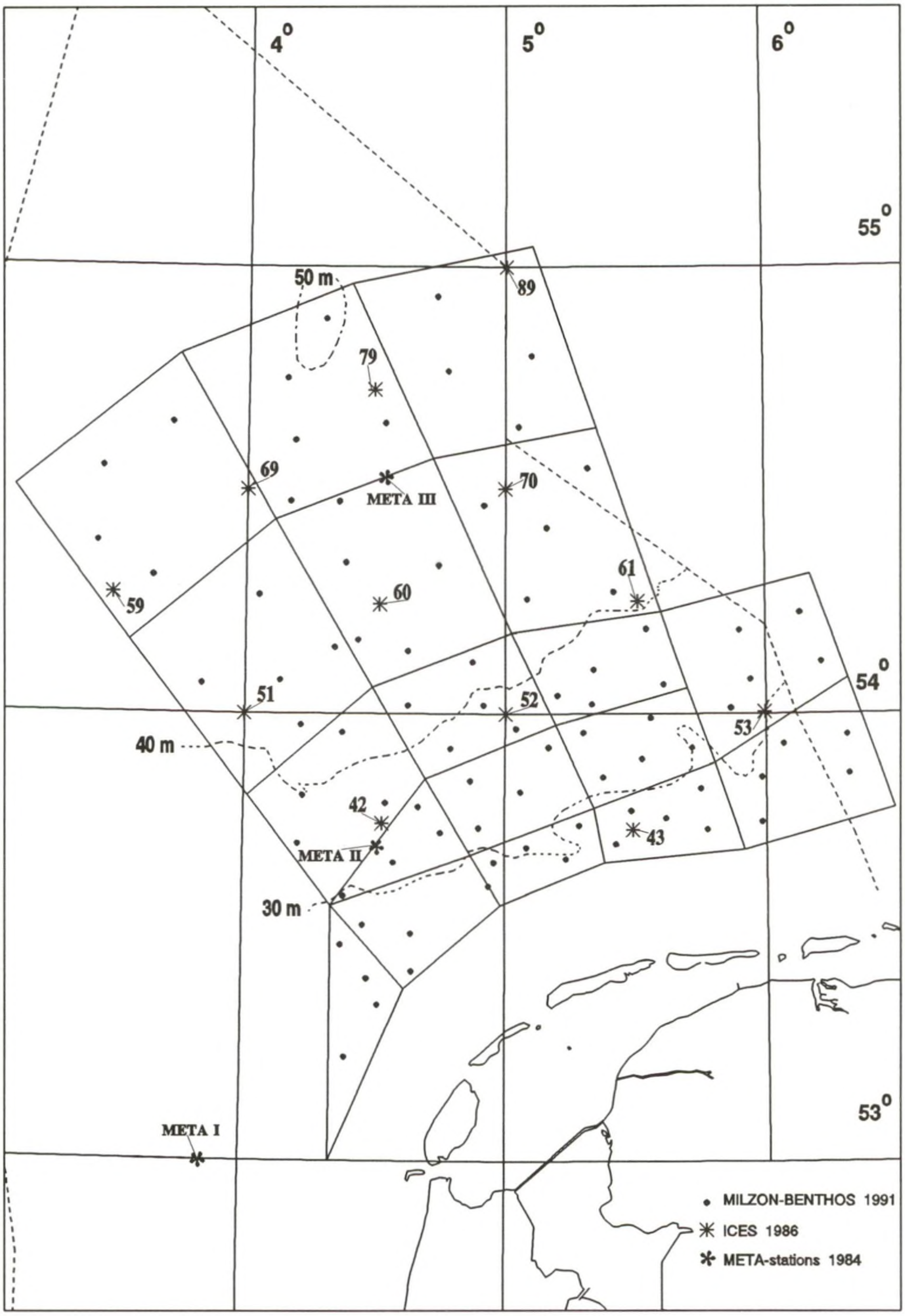


Fig. 3. Locations of ICES (1986) and META stations (de Wilde et al., 1984) in the study area of the MILZON-BENTHOS II 1991 project.

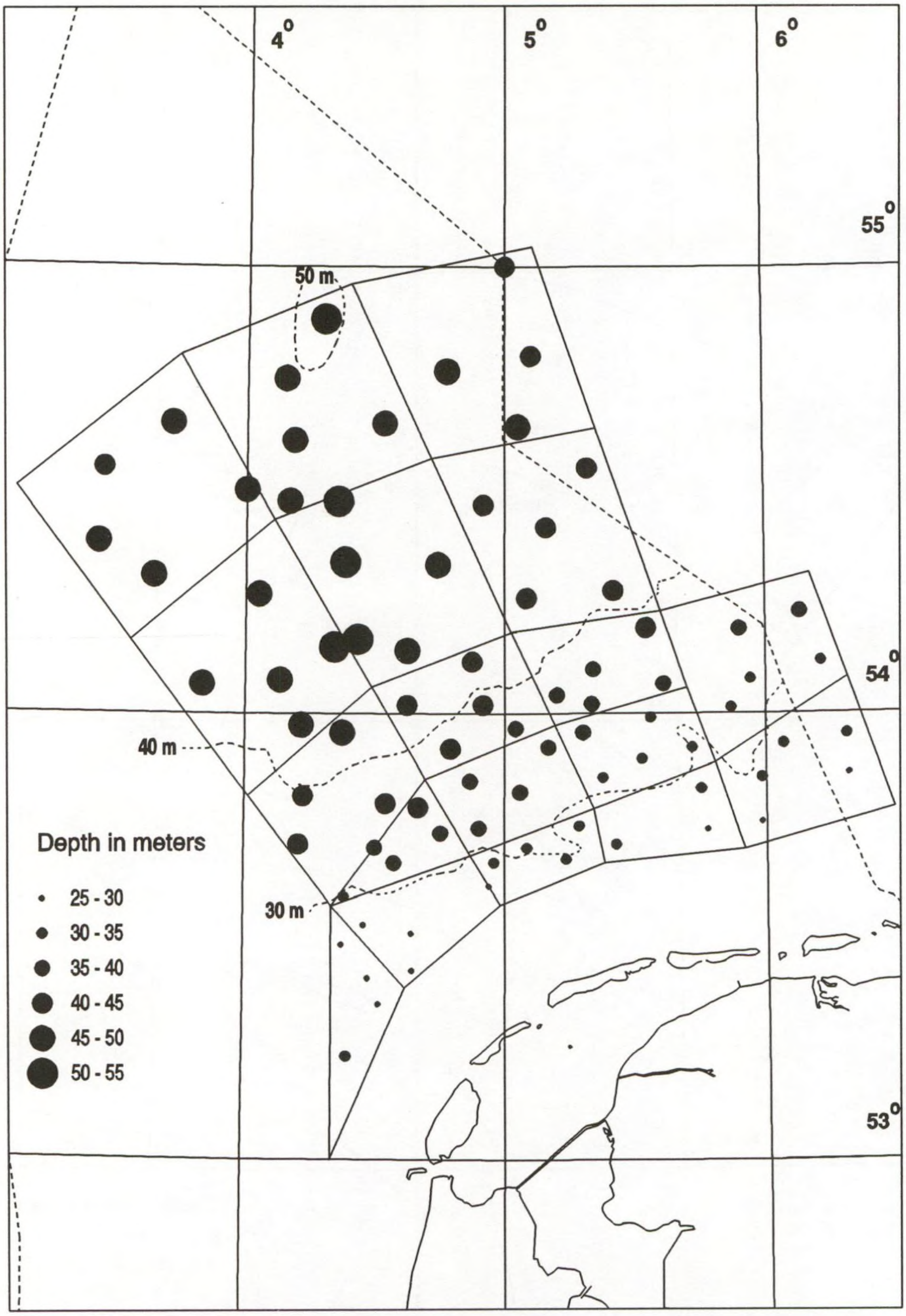


Fig. 4. Depth (m) recordings, uncorrected for differences due to the tidal cycle. Official 30, 40 and 50 m isobaths are indicated.

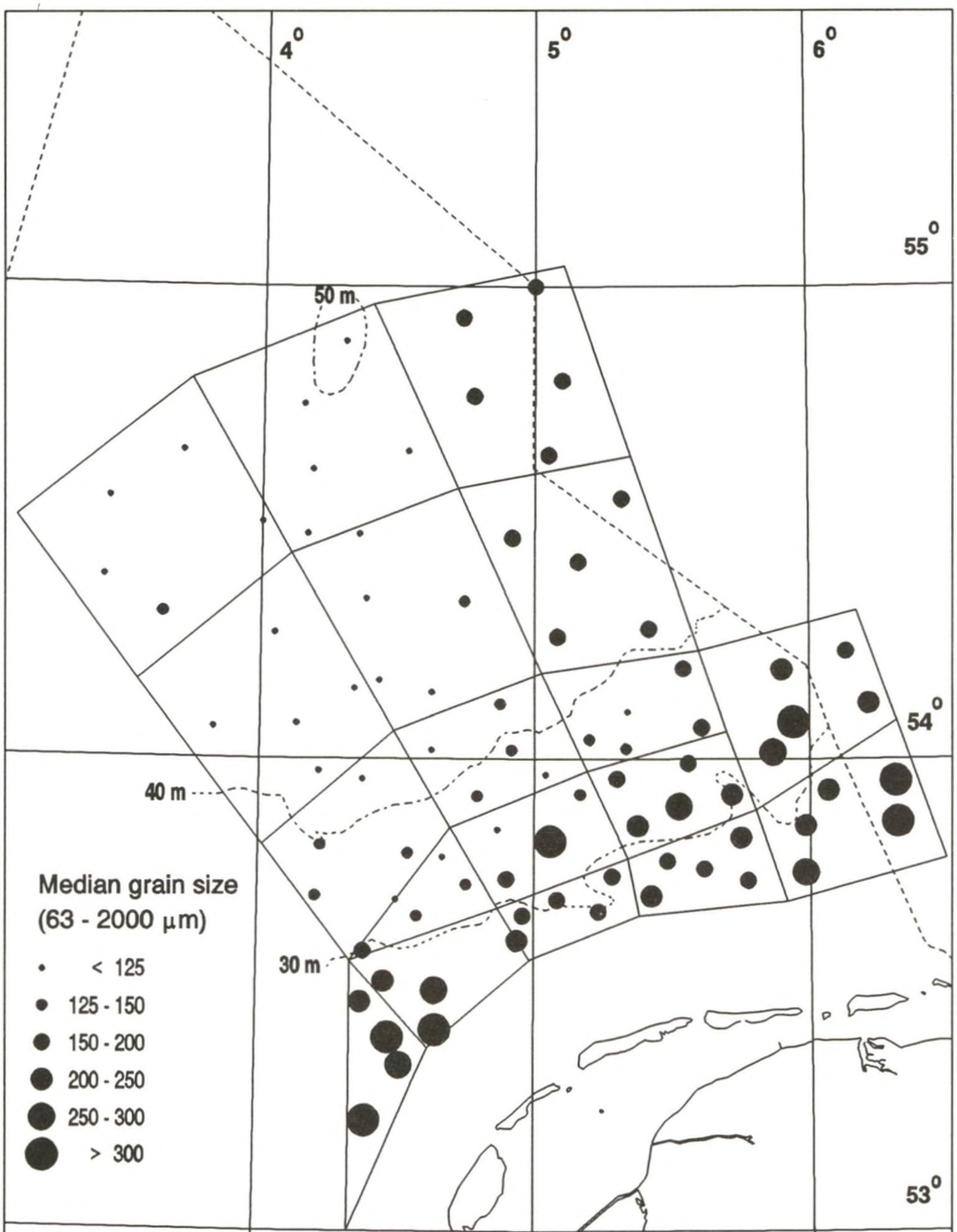


Fig. 5. Median grain size (for the fraction 63 - 2000 µm) of the upper 10 cm of the sediment.

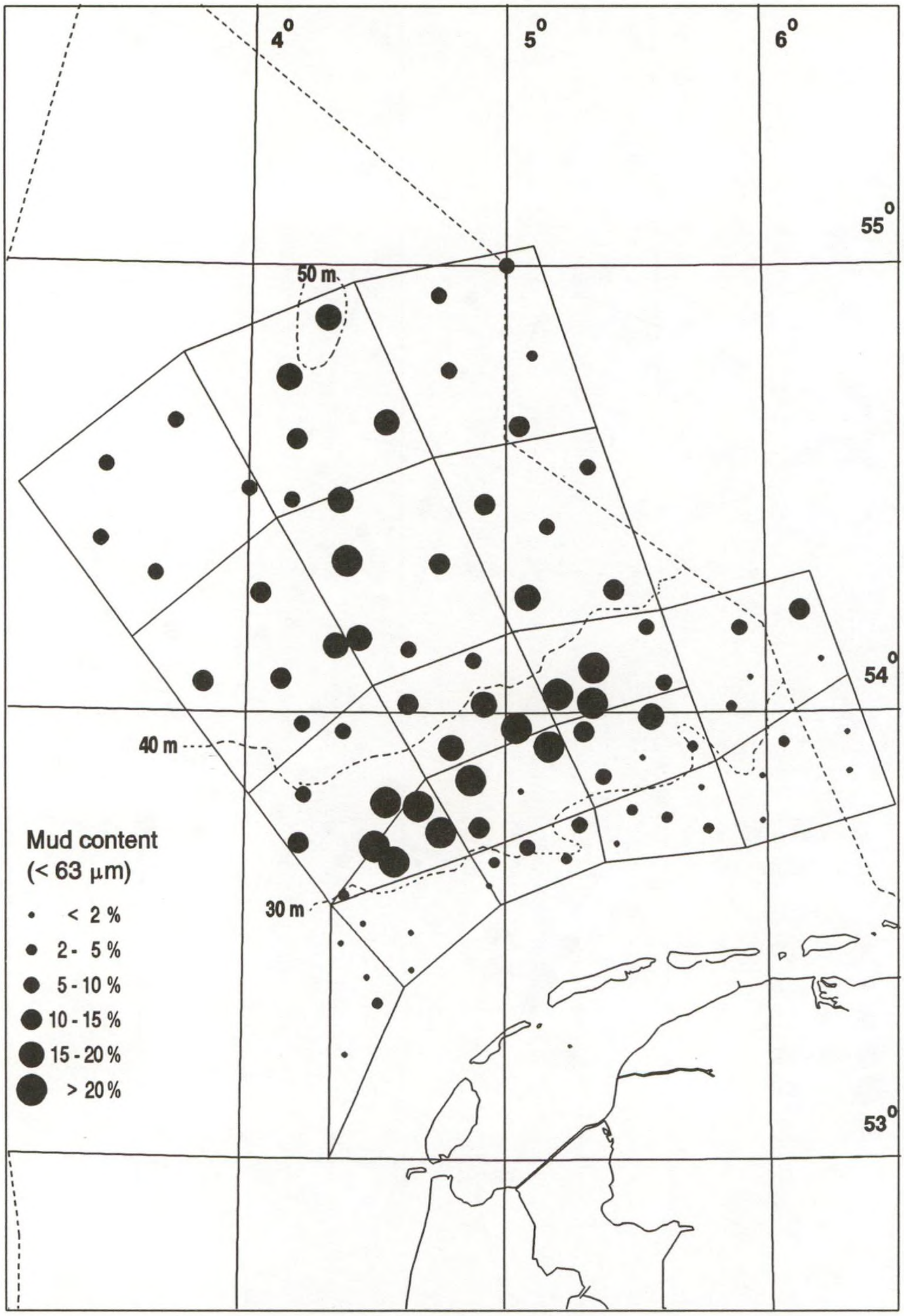


Fig. 6. Mud content (%, particles <63 μm) of the upper 10 cm of the sediment.

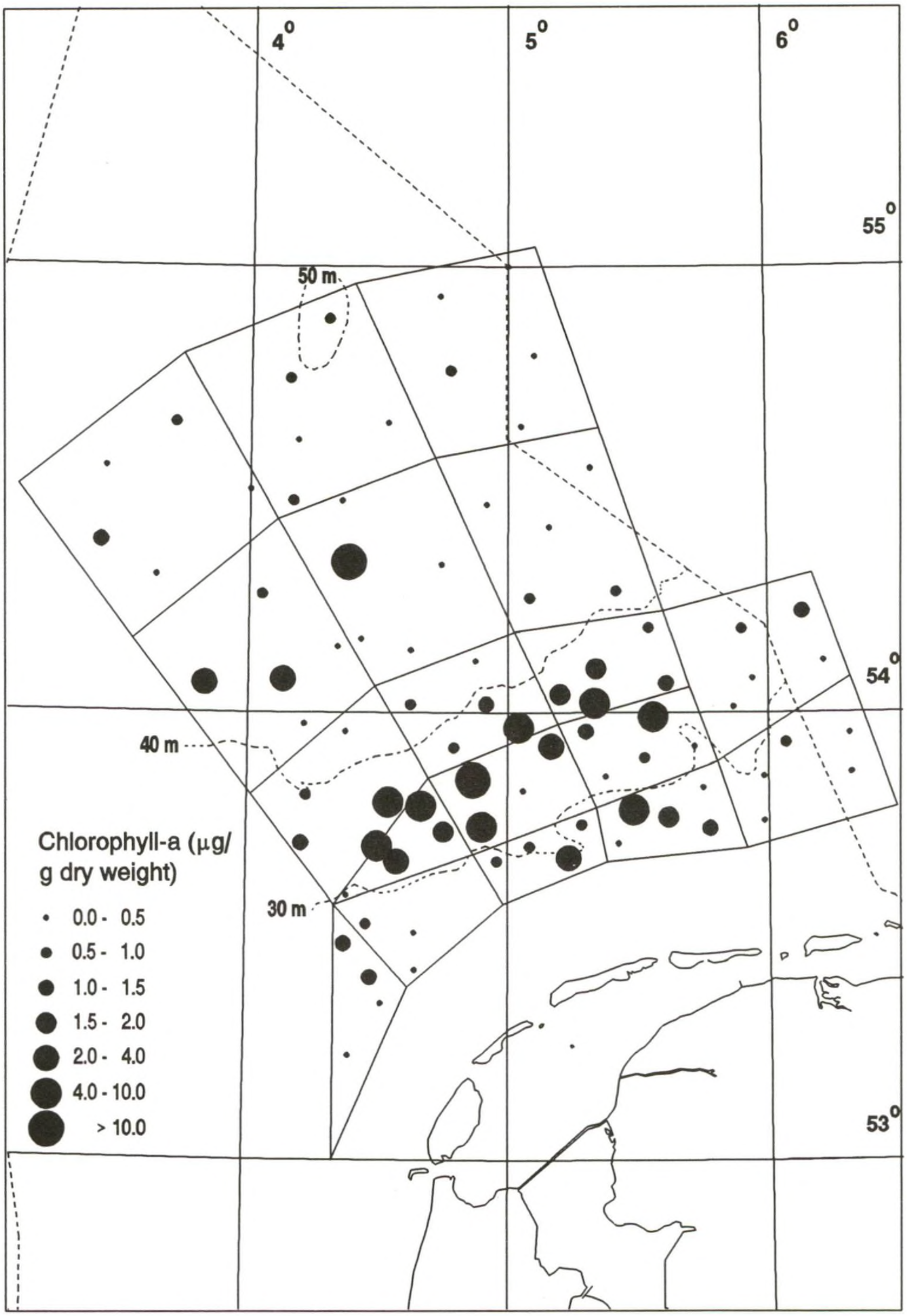


Fig. 7. Chlorophyll-a content (µg/g dry weight) of the upper 3 cm of the sediment.

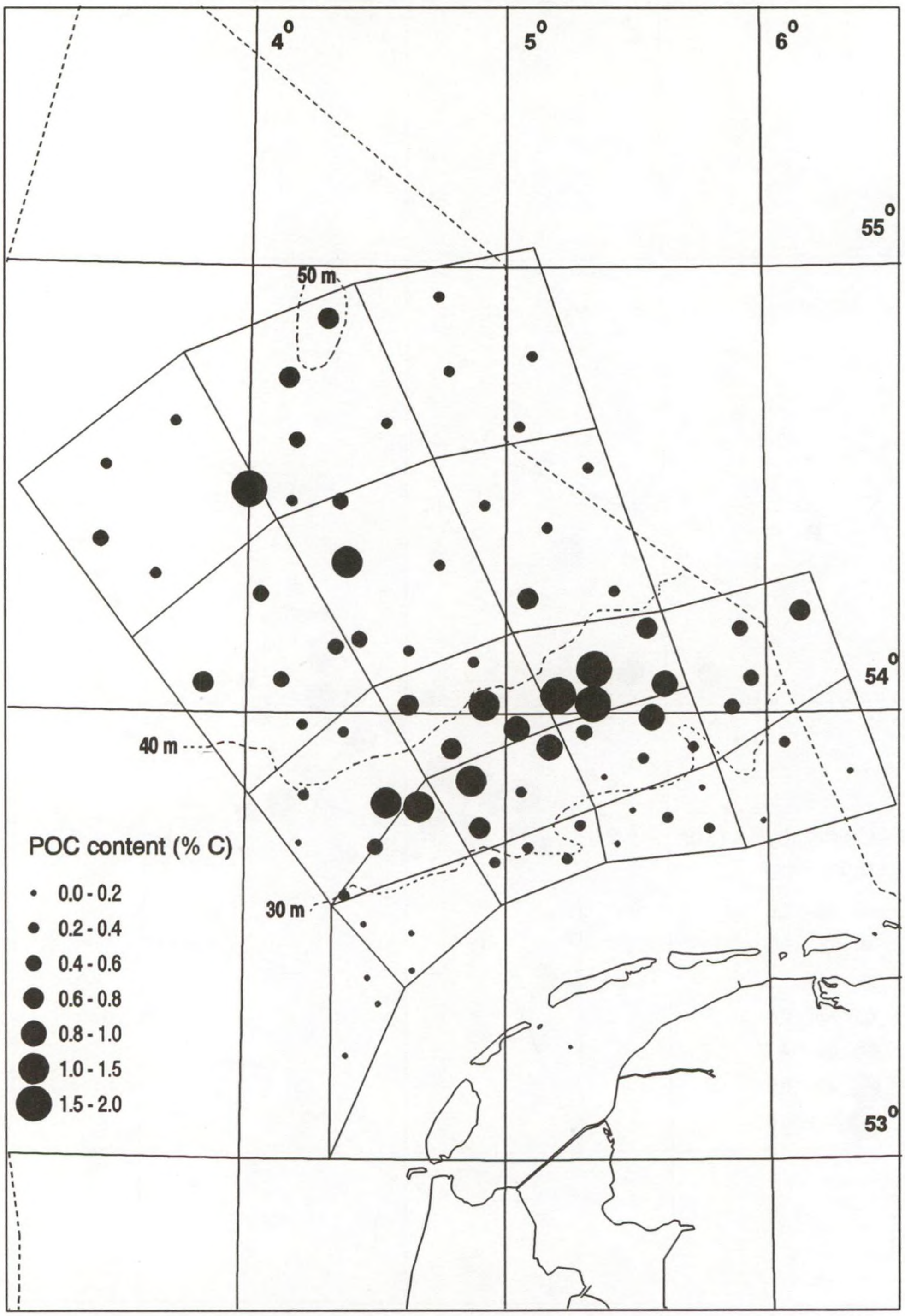


Fig. 8. POC content (% C) of the upper 3 cm of the sediment.

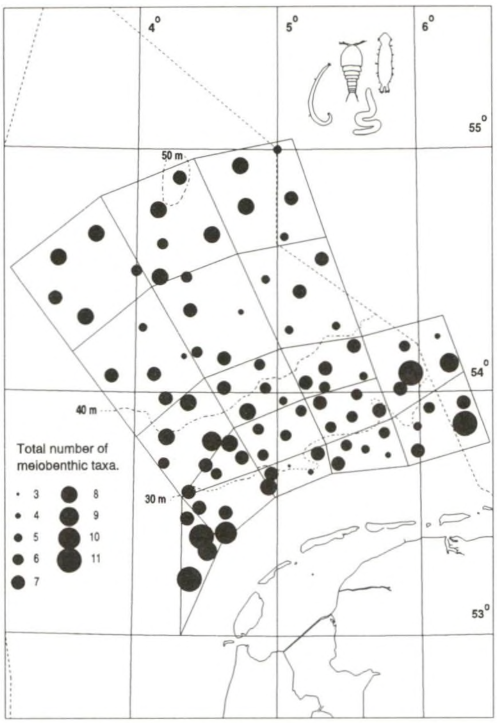


Fig. 9. Total number of meiobenthic taxa (Hill 0).

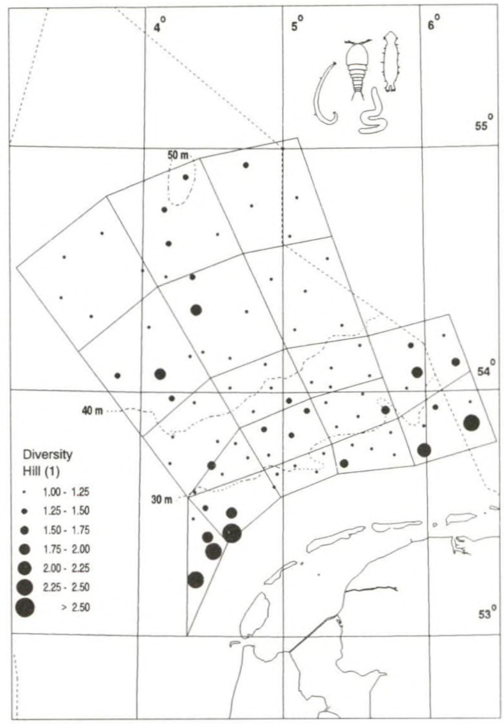


Fig. 10. Diversity (Hill (1)) of the meiobenthos.

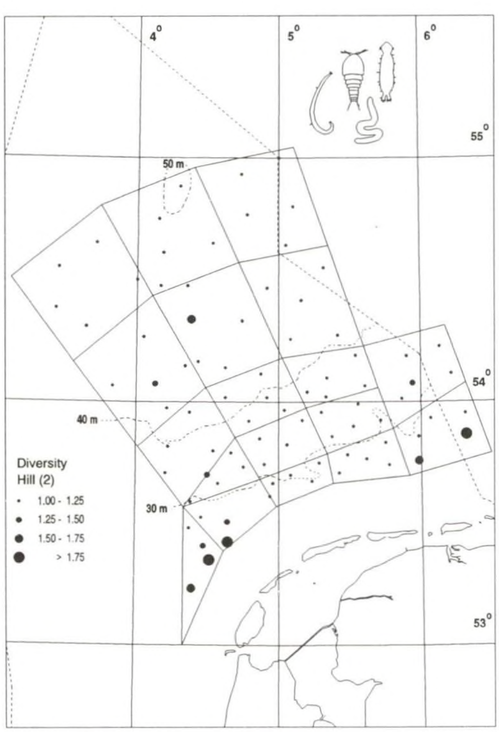


Fig. 11. Diversity (Hill (2)) of the meiobenthos.

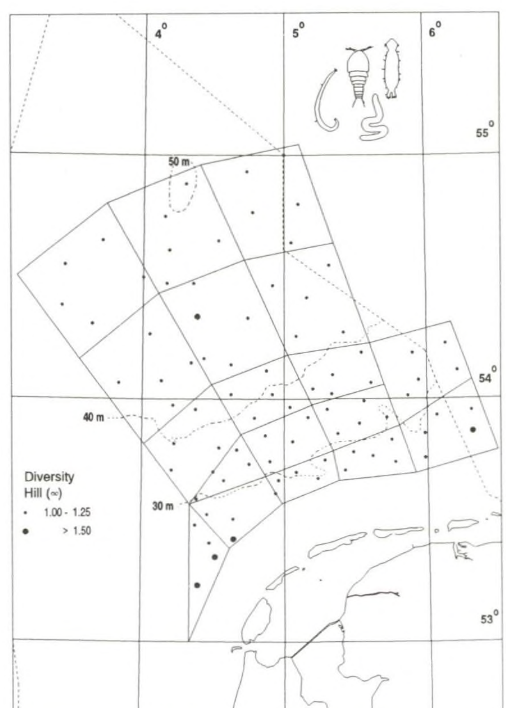


Fig. 12. Diversity (Hill (∞)) of the meiobenthos.

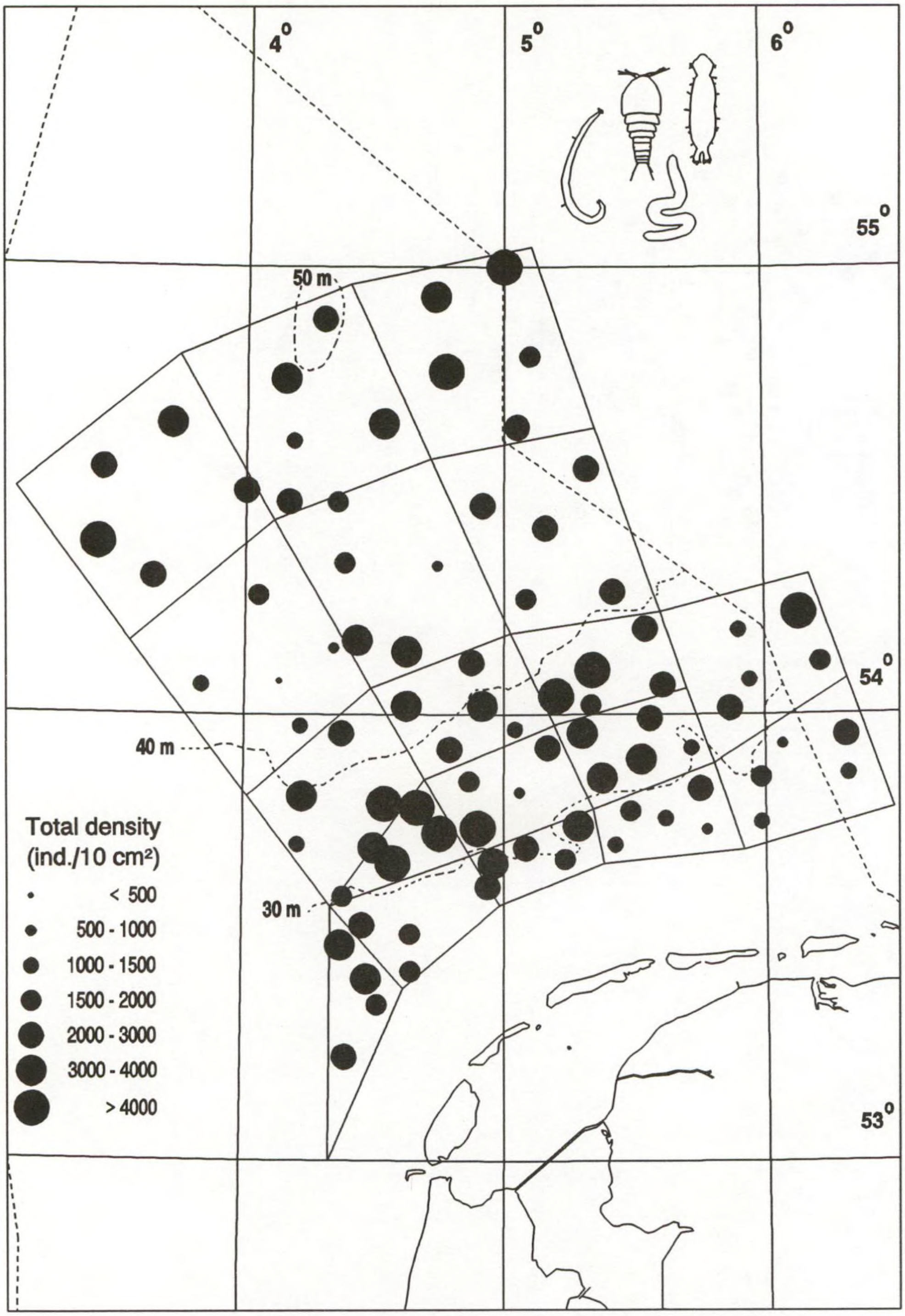


Fig. 13. Total density of the meiobenthos (ind./10 cm²).

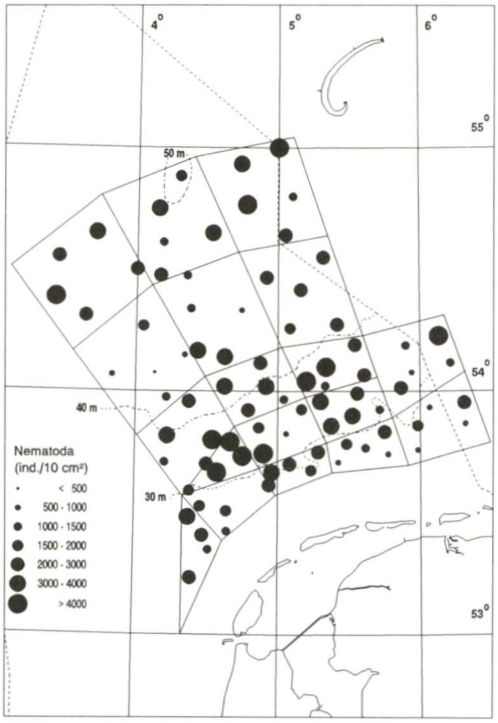


Fig. 14. Spatial distribution of the Nematoda (ind./10 cm²).

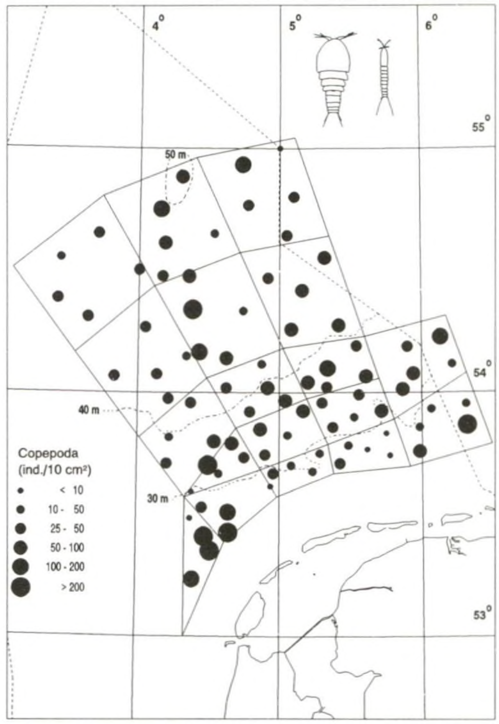


Fig. 15a. Spatial distribution of the (total) Copepoda (ind./10 cm²).

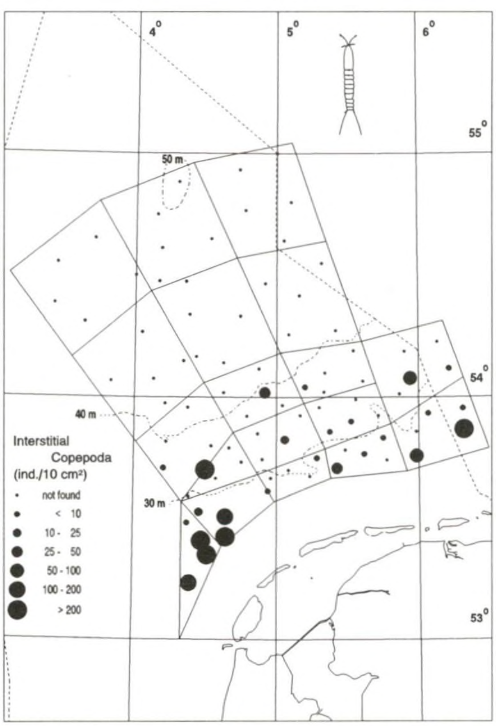


Fig. 15b. Spatial distribution of the interstitial Copepoda (ind./10 cm²).

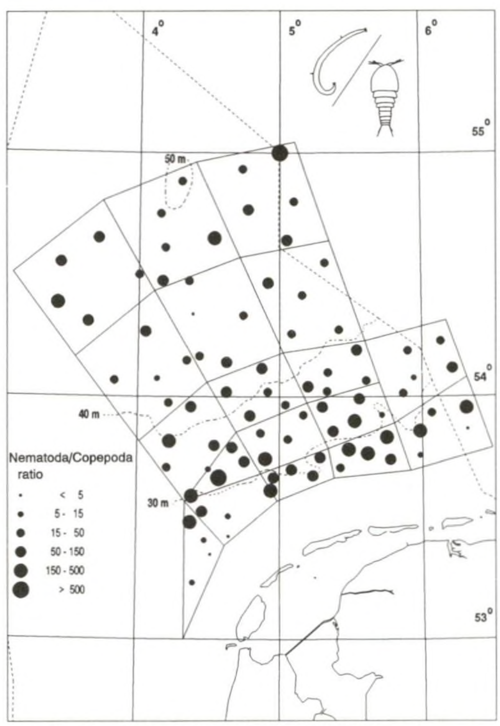


Fig. 16. Spatial distribution of the Nematoda/Copepoda ratio.

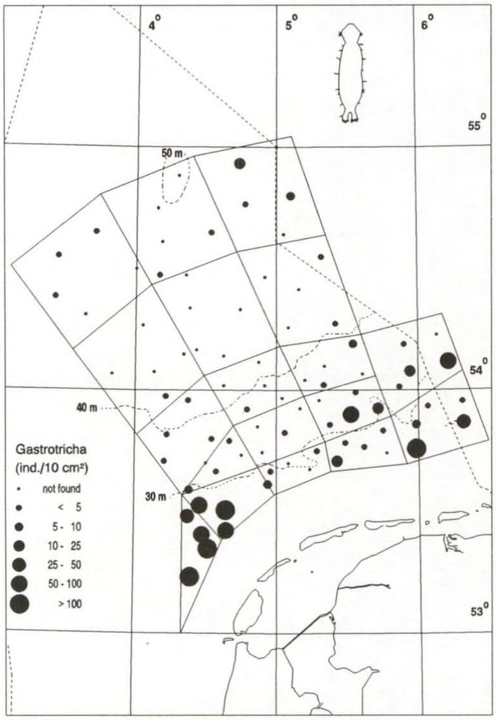


Fig. 17. Spatial distribution of the Gastrotricha (ind./10 cm²).

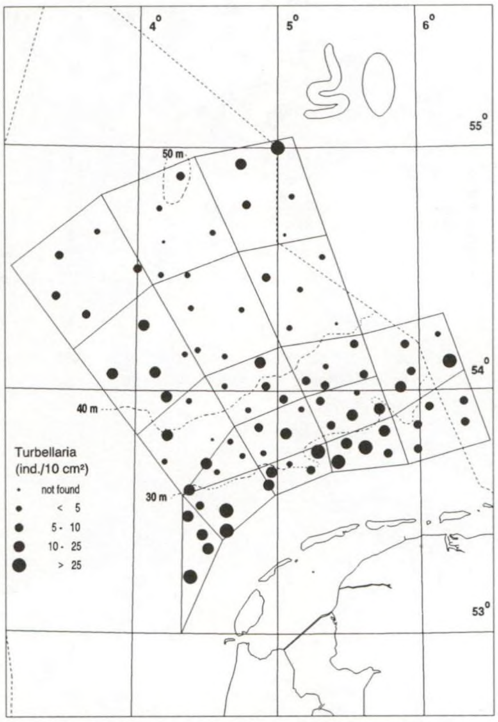


Fig. 18. Spatial distribution of the Turbellaria (ind./10 cm²).

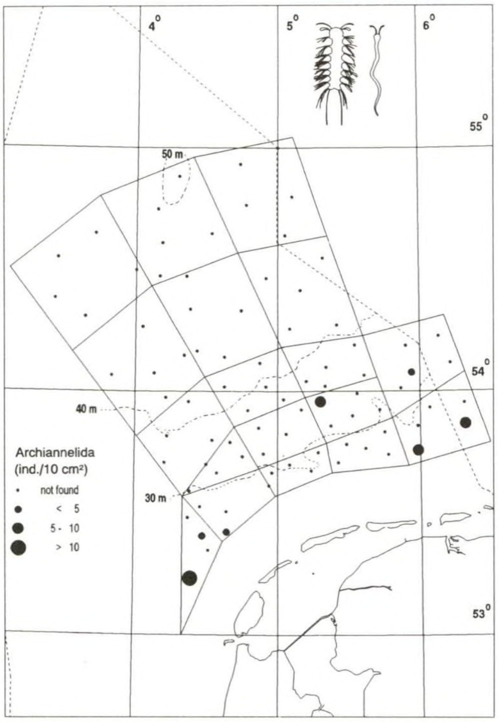


Fig. 19. Spatial distribution of the Archiannelida (ind./10 cm²).

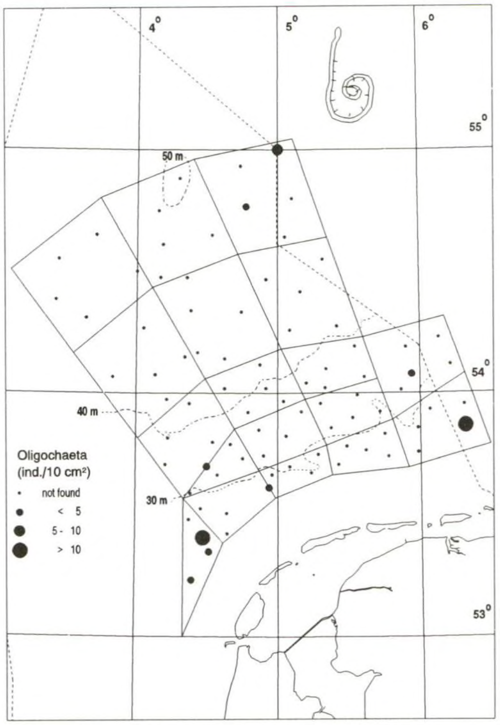


Fig. 20. Spatial distribution of the Oligochaeta (ind./10 cm²).

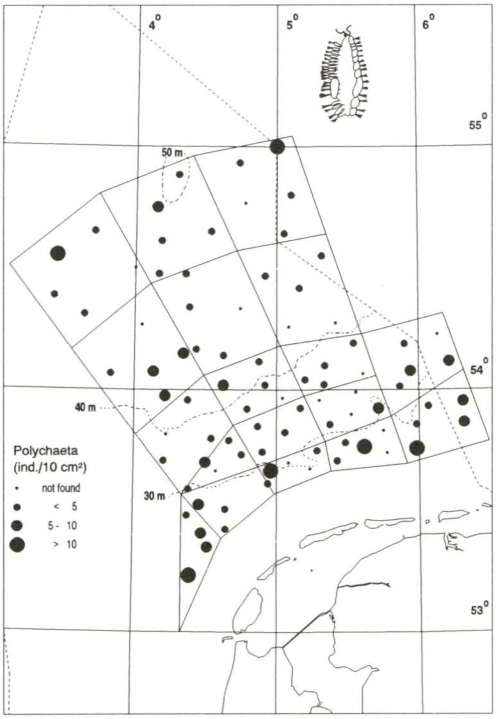


Fig. 21. Spatial distribution of the Polychaeta (< 1 mm)(ind./10 cm²).

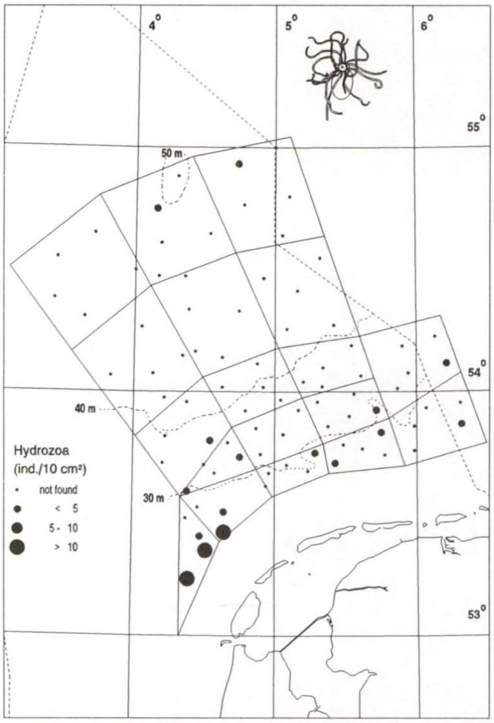


Fig. 22. Spatial distribution of the Hydrozoa (ind./10 cm²).

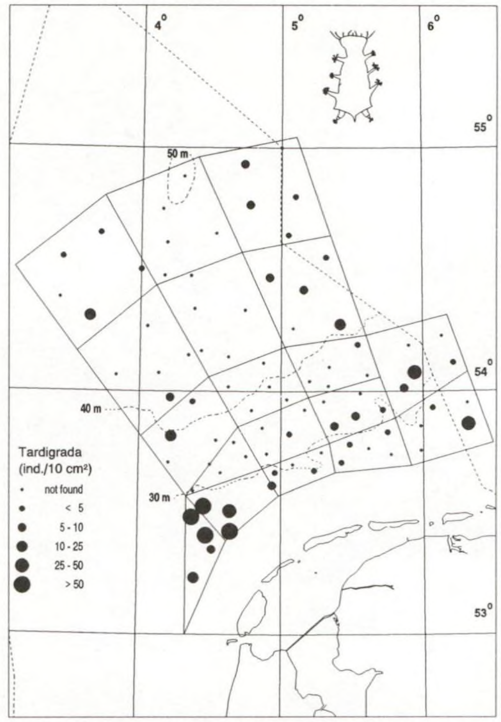


Fig. 23. Spatial distribution of the Tardigrada (ind./10 cm²).

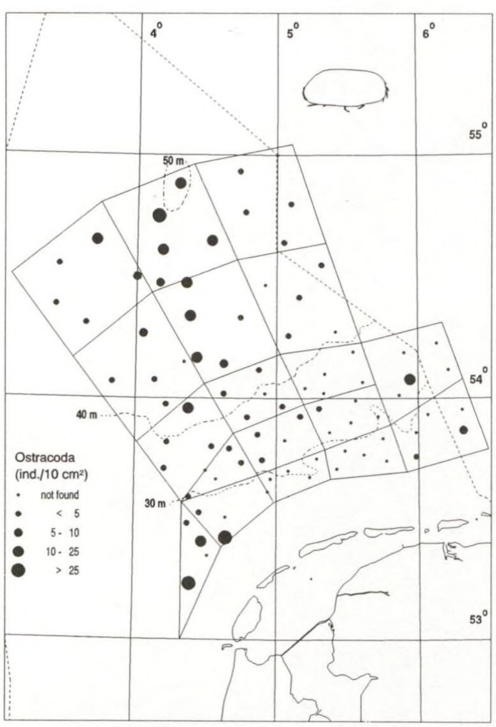


Fig. 24. Spatial distribution of the Ostracoda (ind./10 cm²).

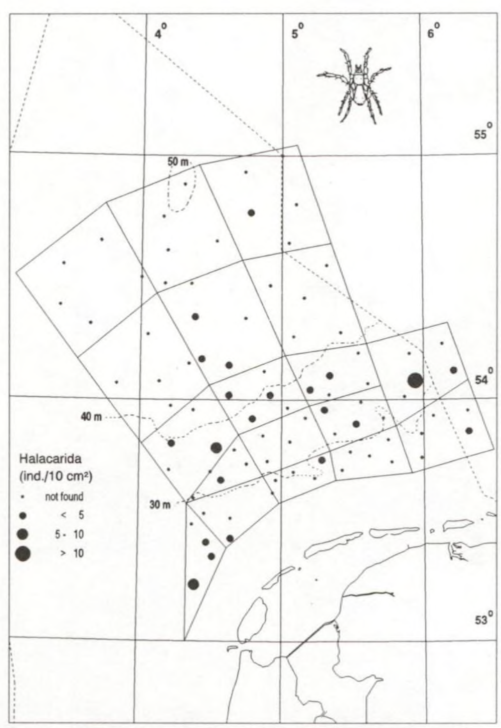


Fig. 25. Spatial distribution of the Halacarida (ind./10 cm²).

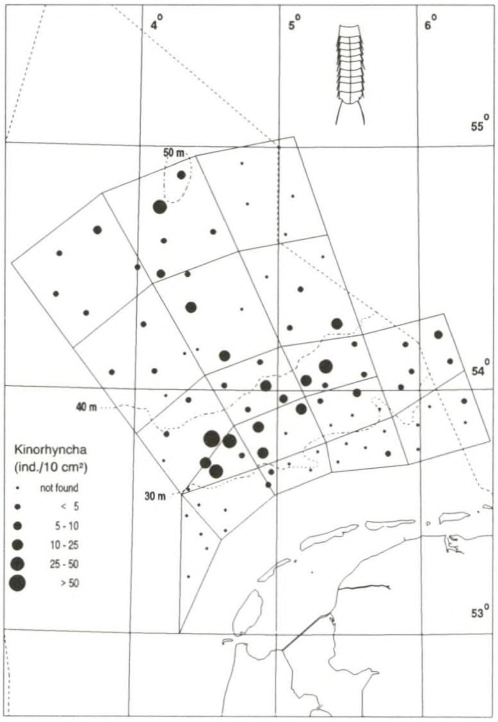


Fig. 26. Spatial distribution of the Kinorhyncha (ind./10 cm²).

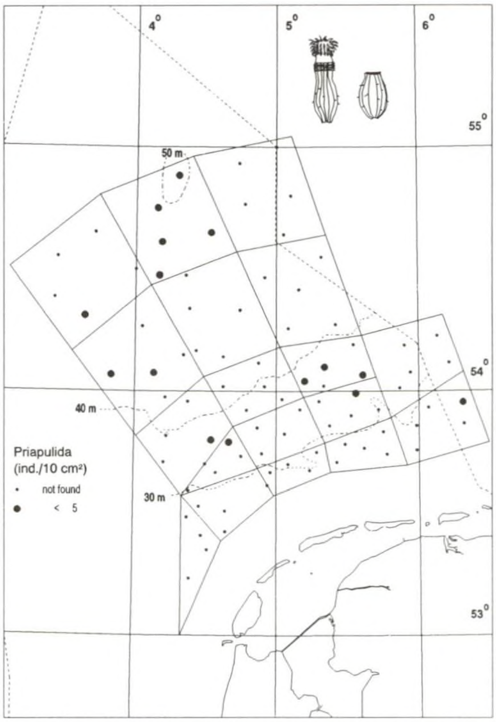


Fig. 27. Spatial distribution of the Priapulida (ind./10 cm²).

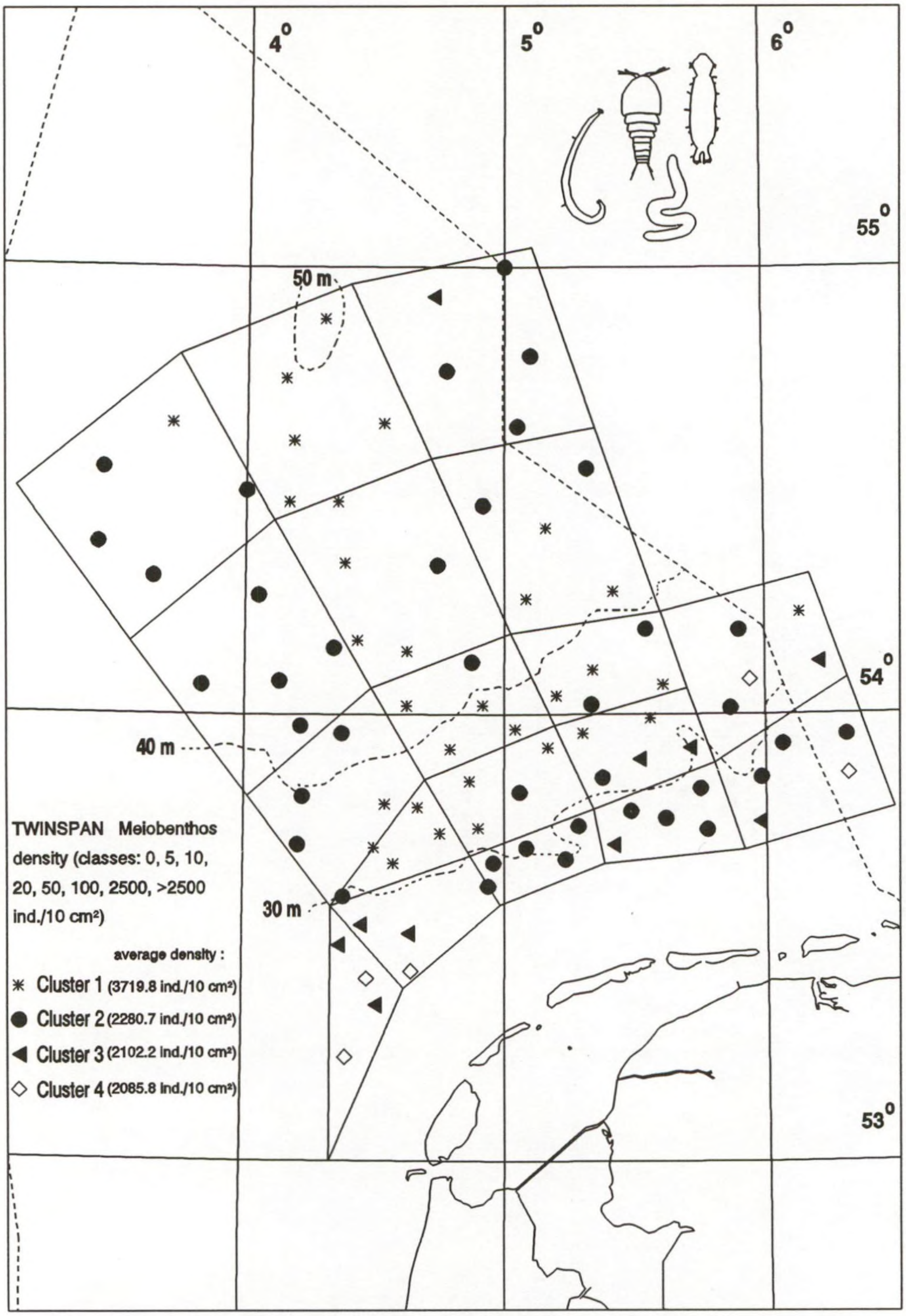


Fig. 28. TWINSPAN clustering of the meiobenthos density (ind./10 cm²).

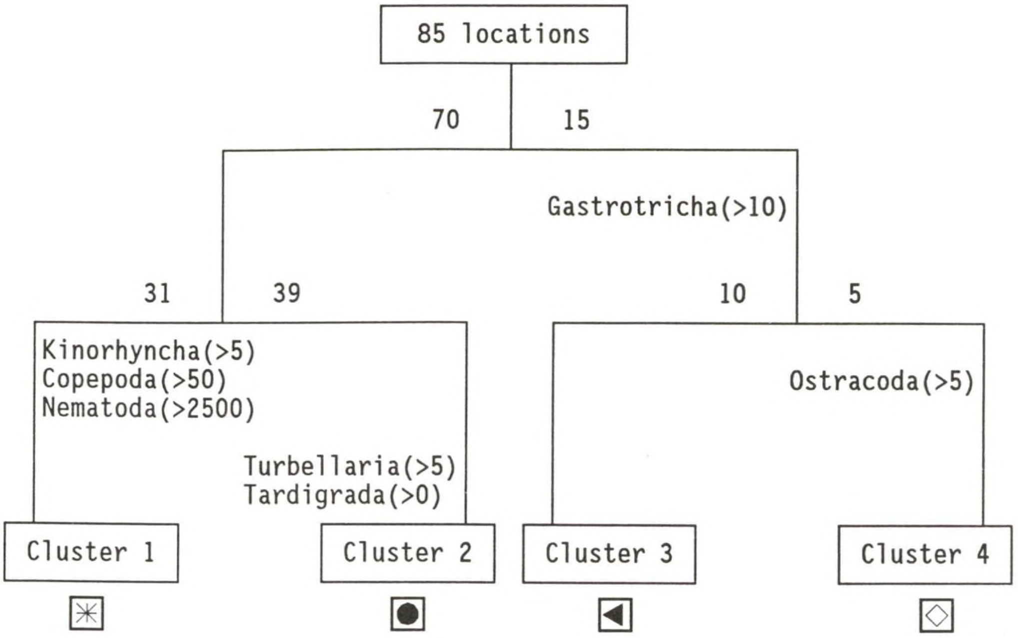


Fig. 29. Dichotomy of the TWINSPAN clusters found in the MILZON-BENTHOS II area 1991 by using the meiobenthos density (ind./10 cm^2). At each level the number of stations involved are shown.
Classes: 0, 5, 10, 50, 100, 2500, >2500 ind./10 cm^2

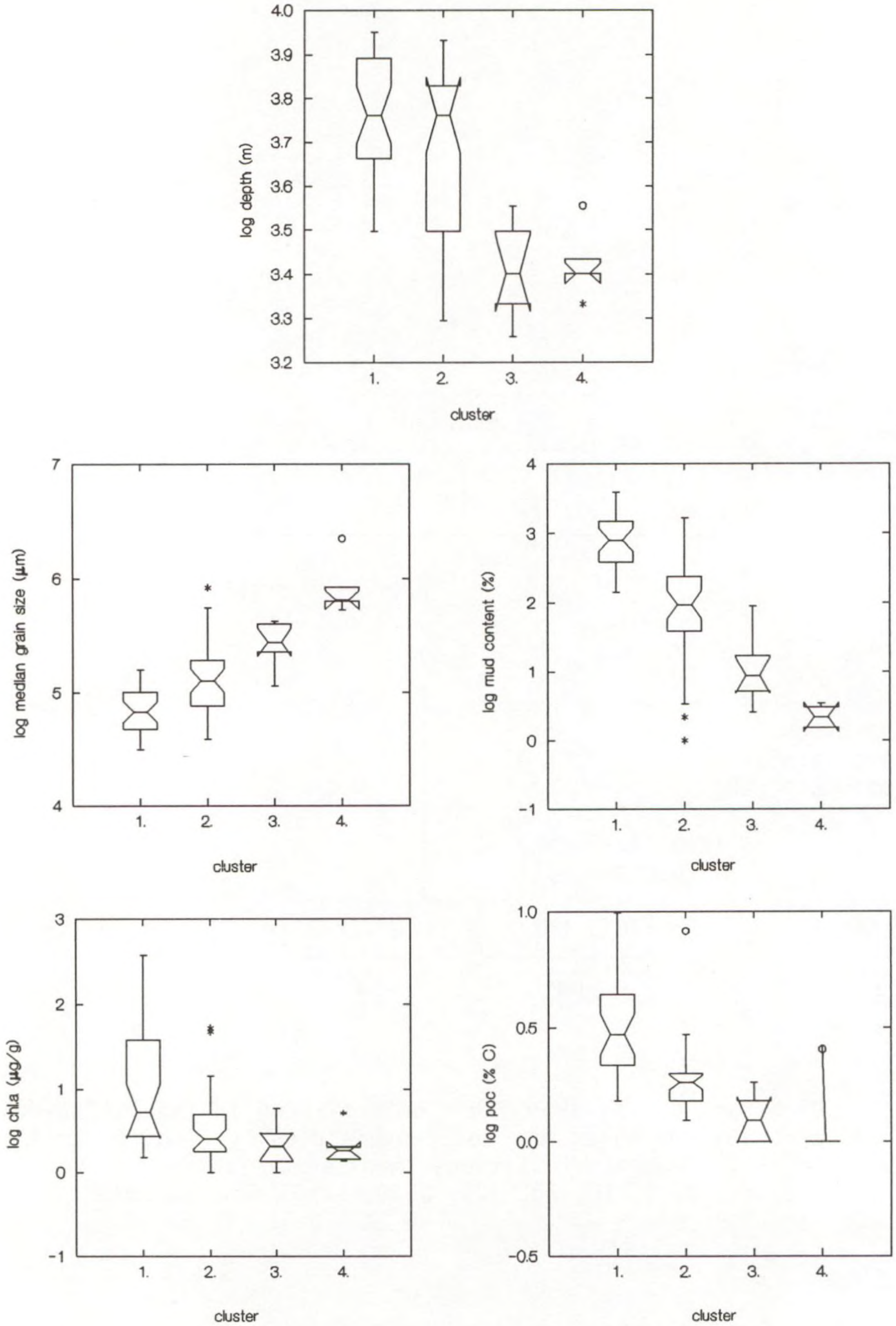


Fig. 30a. **Box and whisker plots of the average abiotic parameters (log(x+1)-transformed after TWINSPAN analysis using the data of the meiobenthic density (ind./10 cm²) (cf. Figs. 28, 29 and Table 6).**

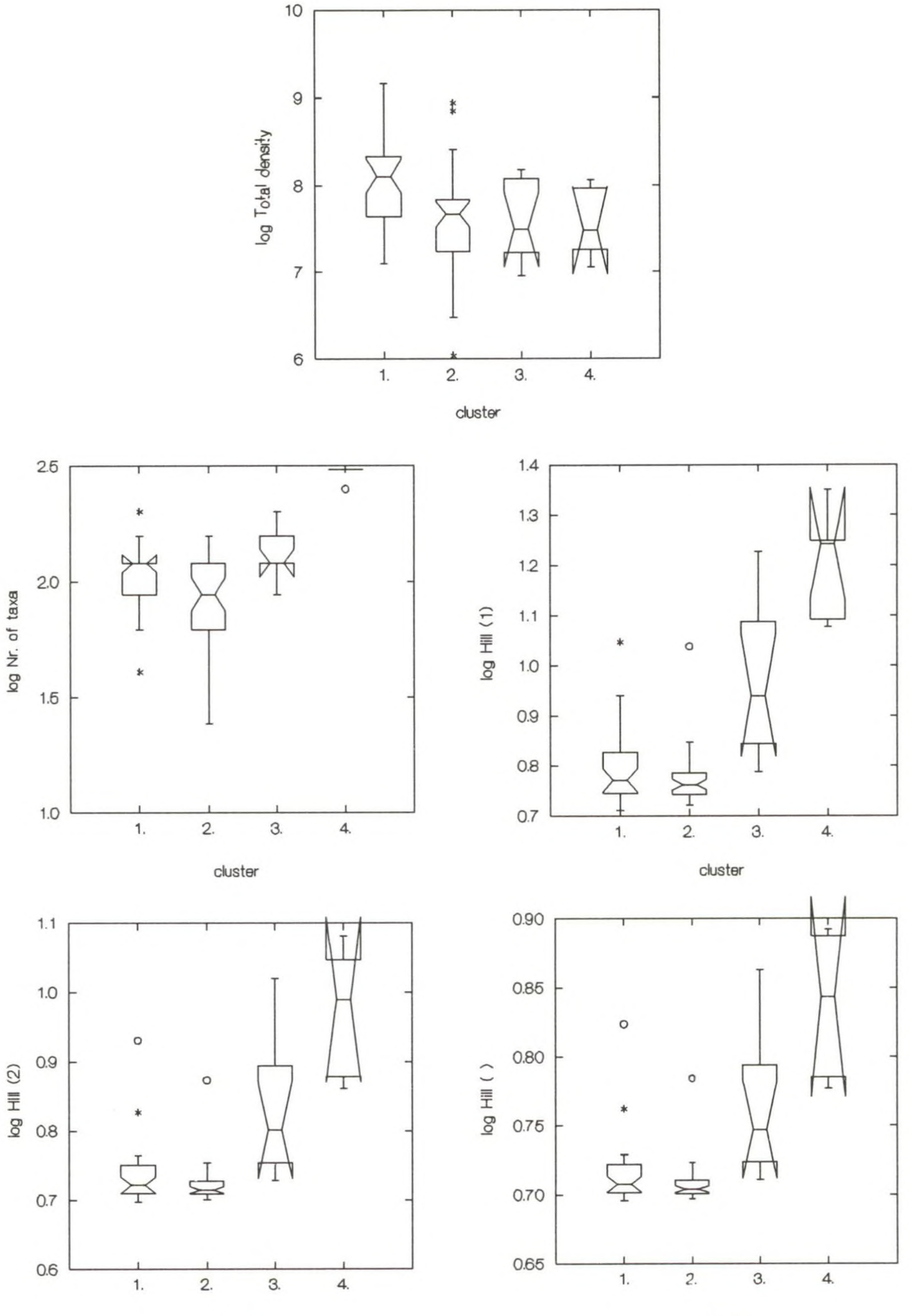


Fig. 30b. Box and whisker plots of some average meiobenthic parameters (log(x+1)-transformed after TWINSPAN analysis using the data of the meiobenthic density (ind./10 cm²) (cf. Figs. 28, 29 and Table 6).

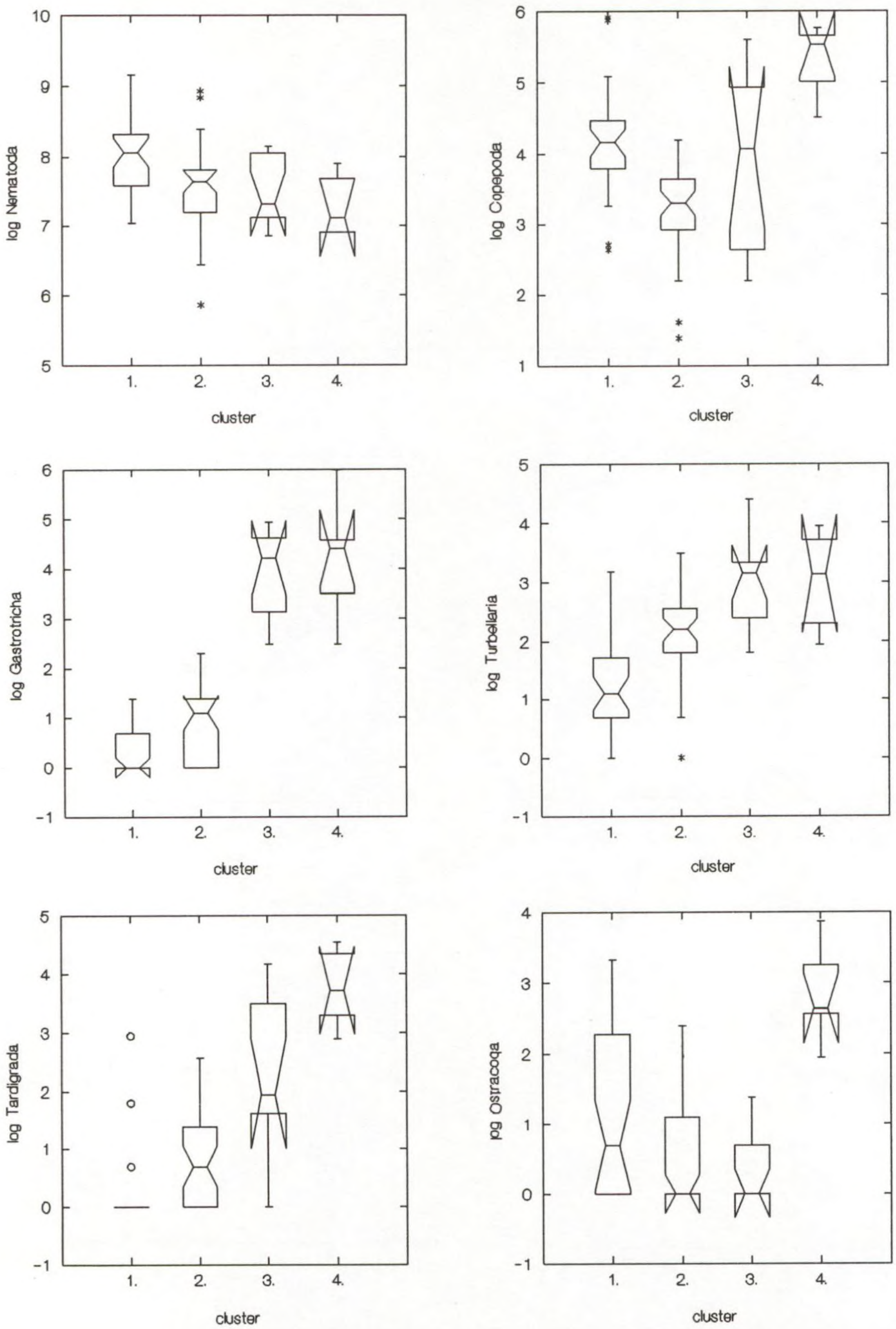


Fig. 30c. Box and whisker plots of the average density (log(x+1)-transformed) after TWINSPAN analysis using the data of the meiobenthos density (ind./10 cm²) (cf. Figs. 28, 29 and Table 6).

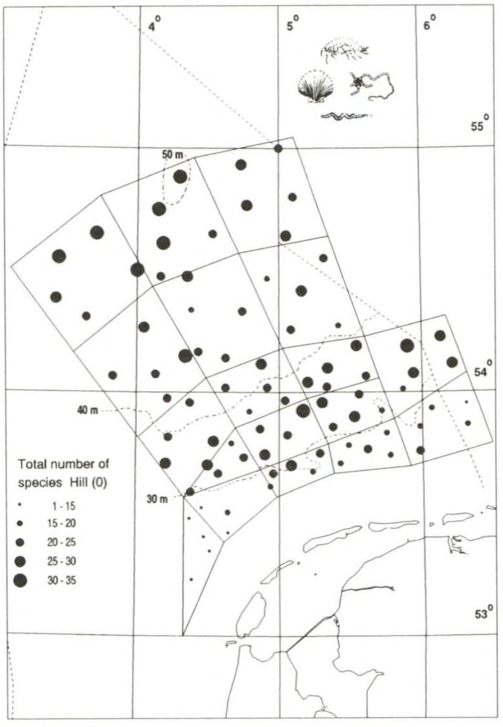


Fig. 31. Total number of macrobenthic species (Hill (0)).

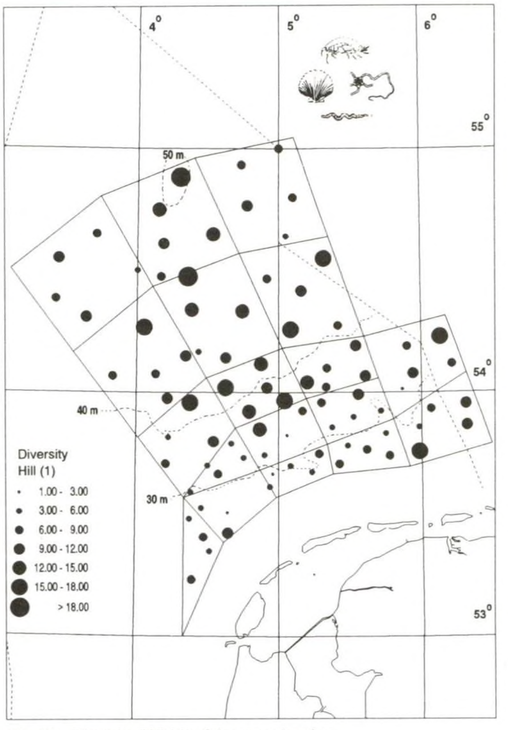


Fig. 32. Diversity (Hill (1)) of the macrobenthos.

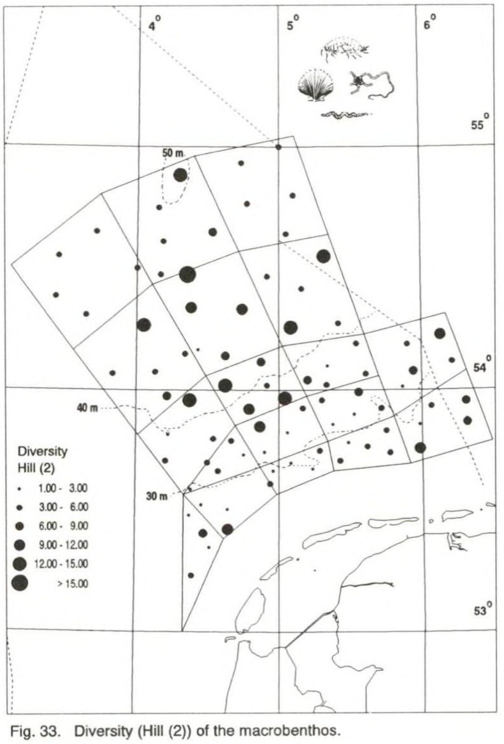


Fig. 33. Diversity (Hill (2)) of the macrobenthos.

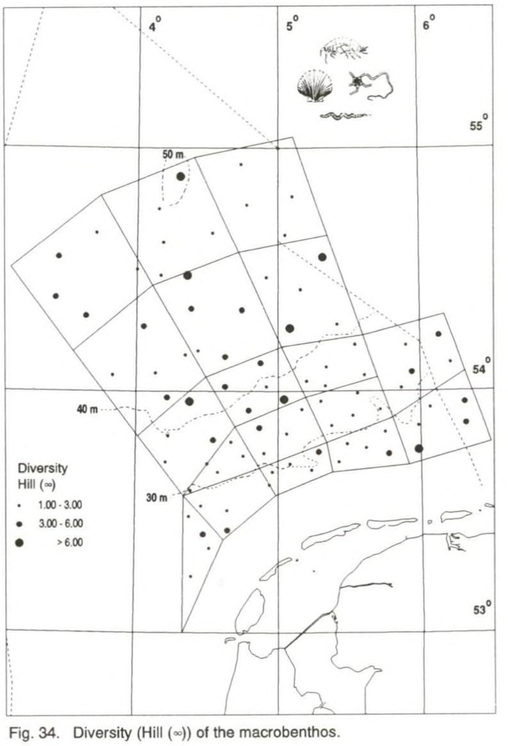


Fig. 34. Diversity (Hill (∞)) of the macrobenthos.

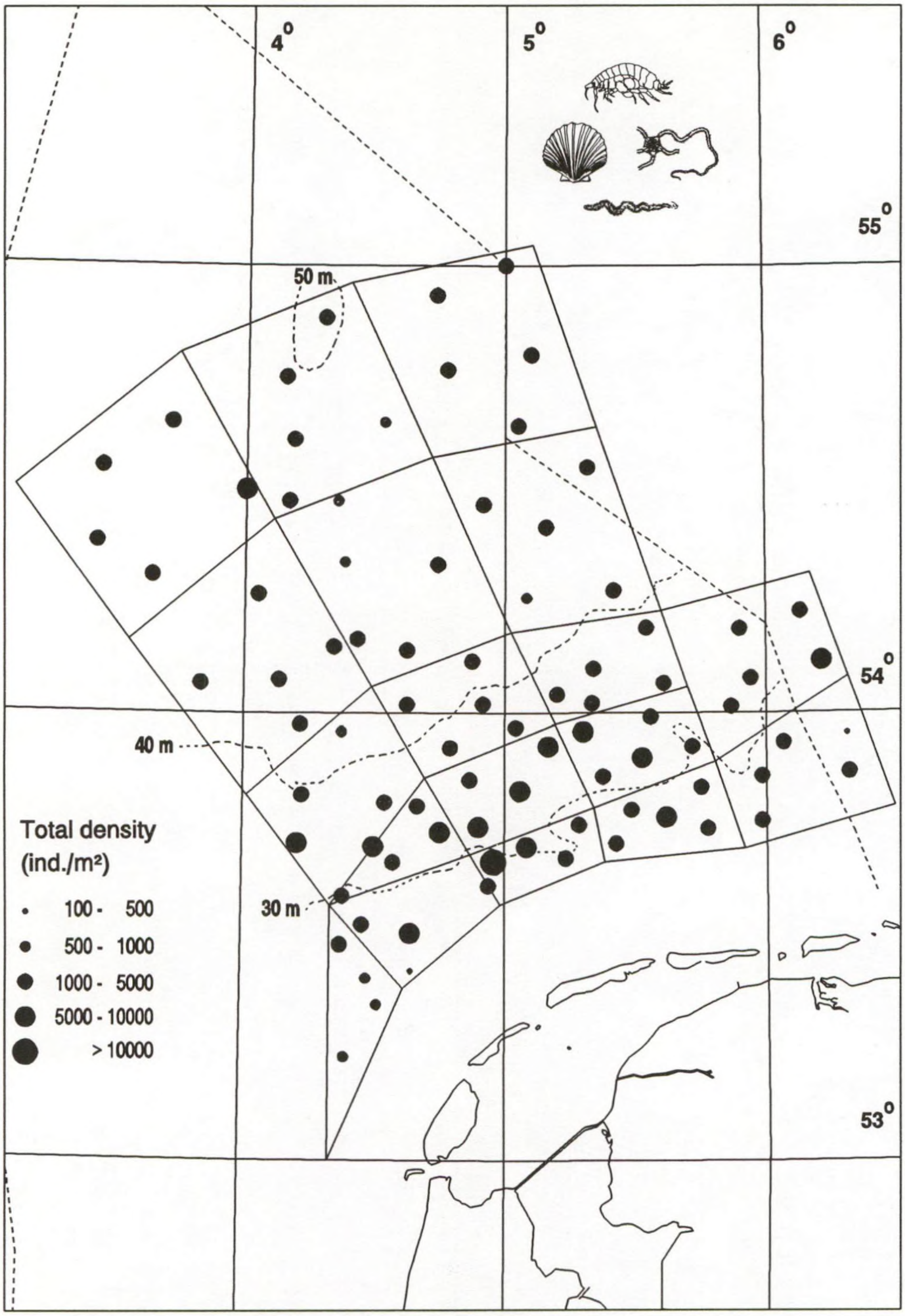


Fig. 35. Total density of the macrobenthos (ind./m²).

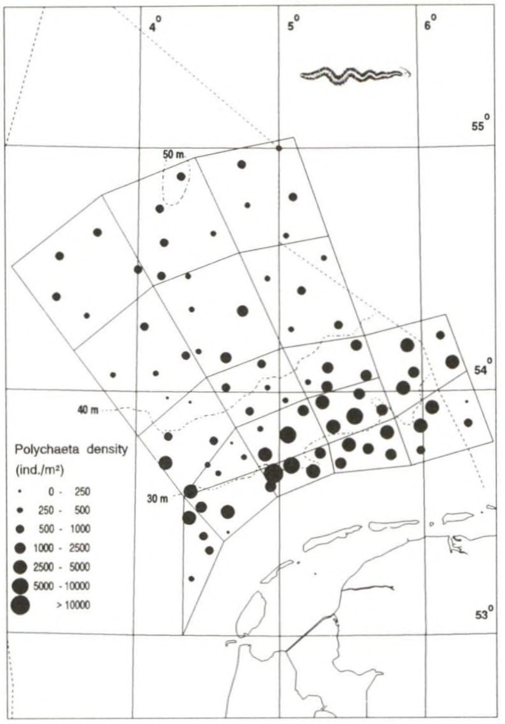


Fig. 36. Spatial distribution of the Polychaeta density (ind./m²).

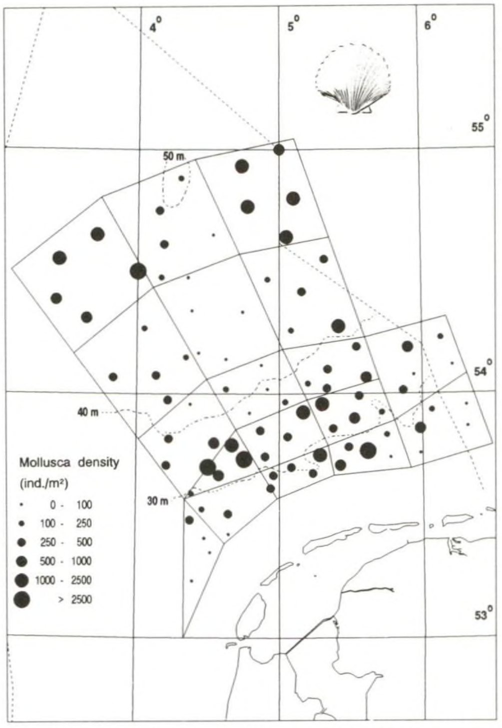


Fig. 37. Spatial distribution of the Mollusca density (ind./m²).

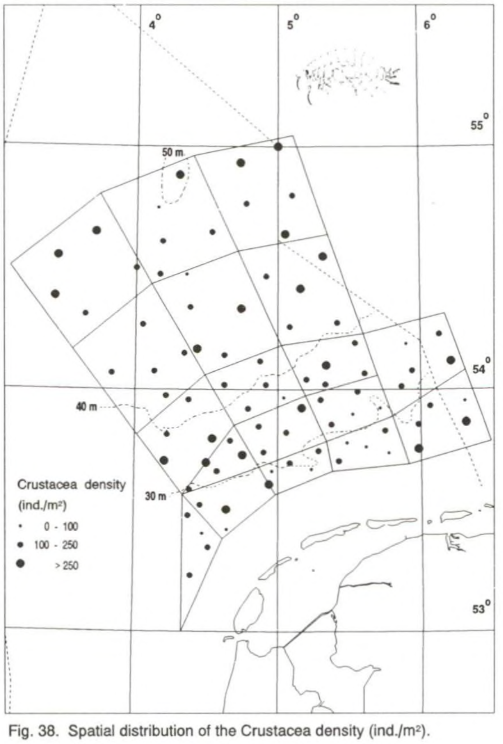


Fig. 38. Spatial distribution of the Crustacea density (ind./m²).

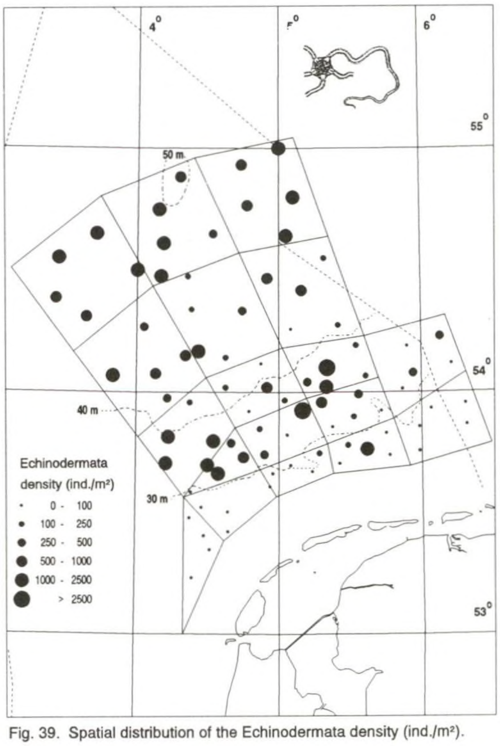


Fig. 39. Spatial distribution of the Echinodermata density (ind./m²).

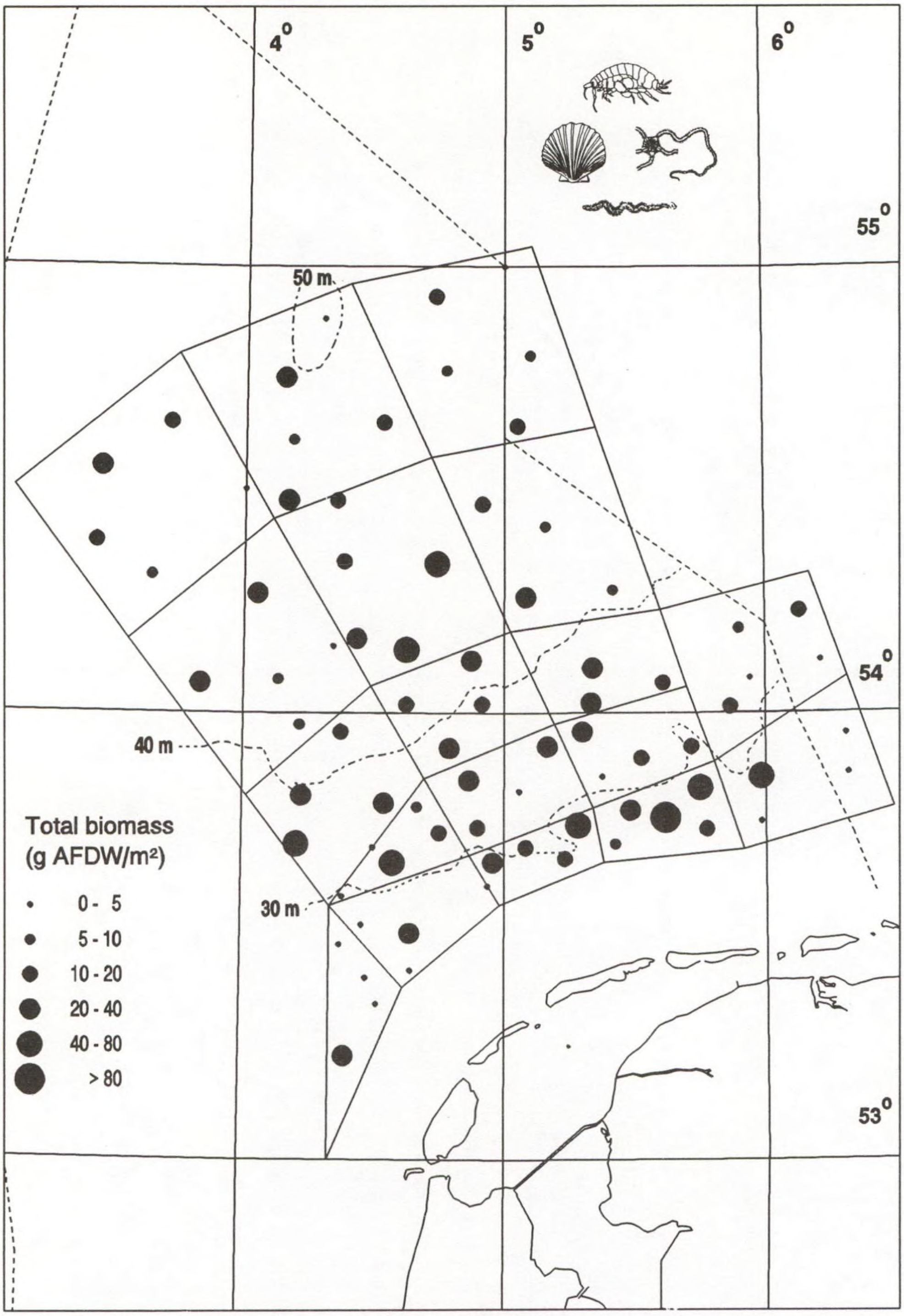


Fig. 40. Total biomass of the macrobenthos (g AFDW/m²).

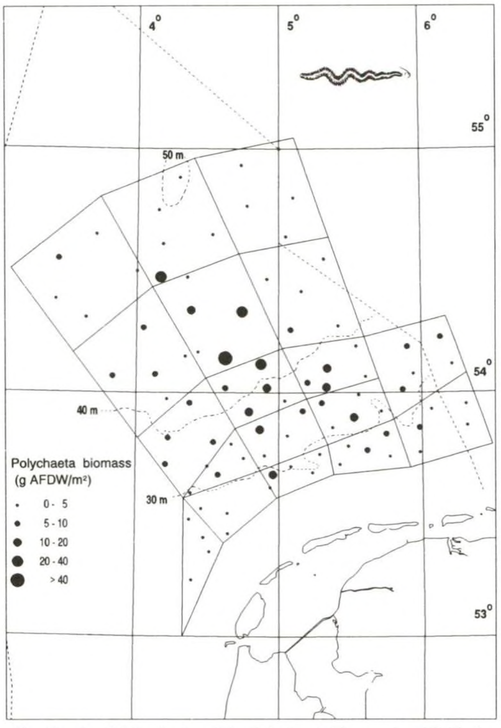


Fig. 41. Spatial distribution of the Polychaeta biomass (g AFDW/m²).

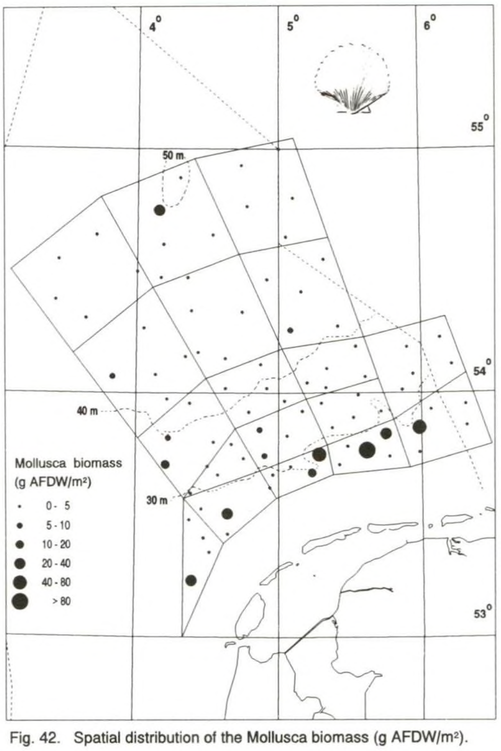


Fig. 42. Spatial distribution of the Mollusca biomass (g AFDW/m²).

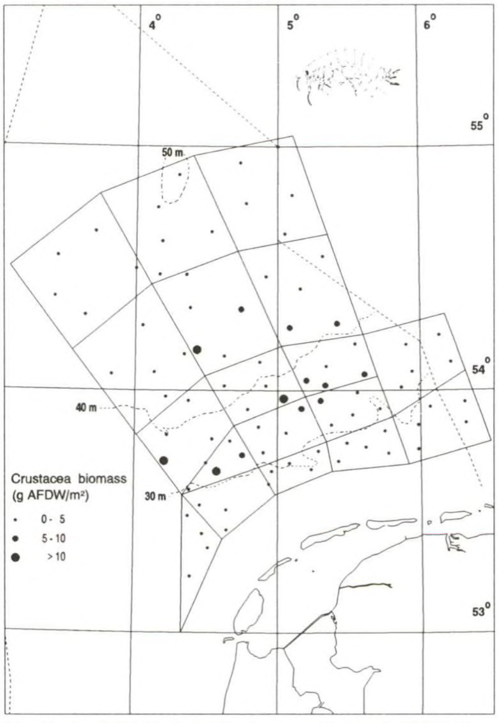


Fig. 43. Spatial distribution of the Crustacea biomass (g AFDW/m²).

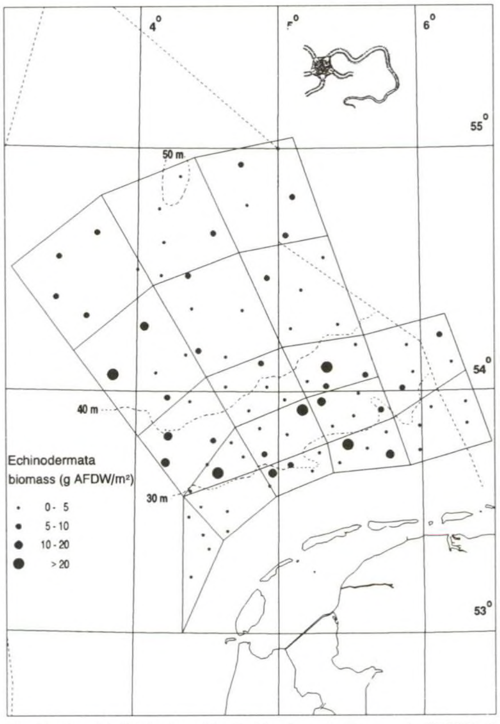


Fig. 44. Spatial distribution of the Echinodermata biomass (g AFDW/m²).

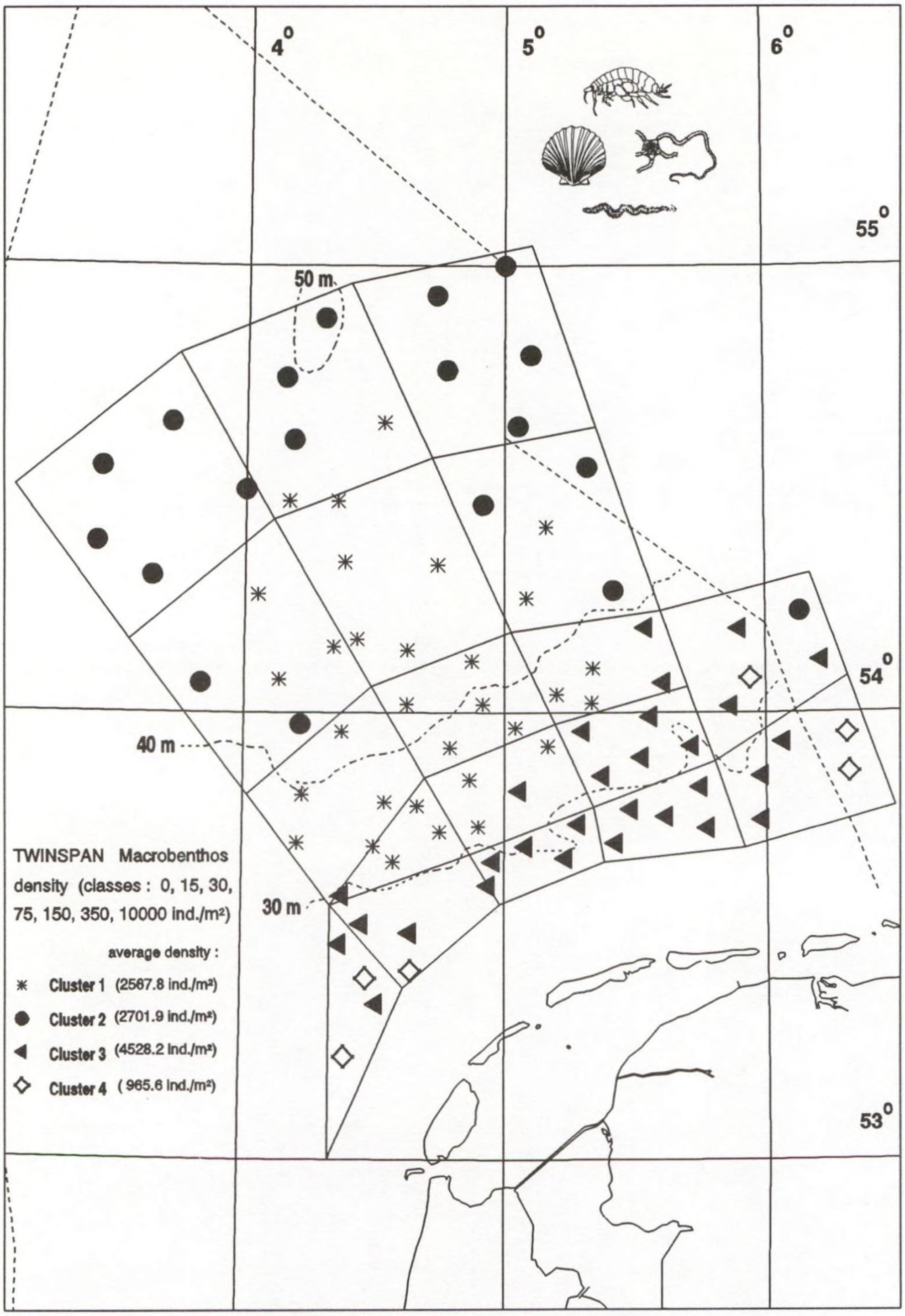


Fig. 45. TWINSPAN clustering of the macrobenthos density (ind./m²).

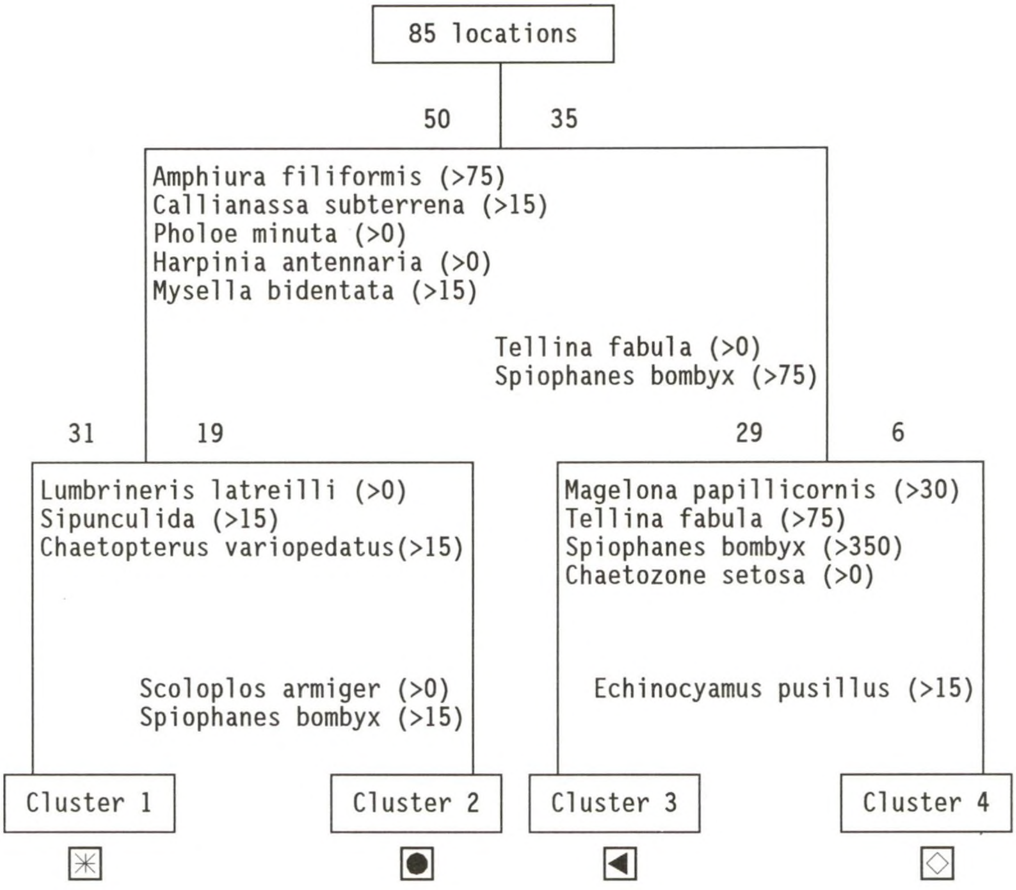


Fig. 46. Dichotomy of the TWINSPAN cluster found in the MILZON-BENTHOS II area 1991 by using the macrobenthos density (ind./m²). Classes : 0, 15, 30, 75, 150, 350, 10000 ind./m²

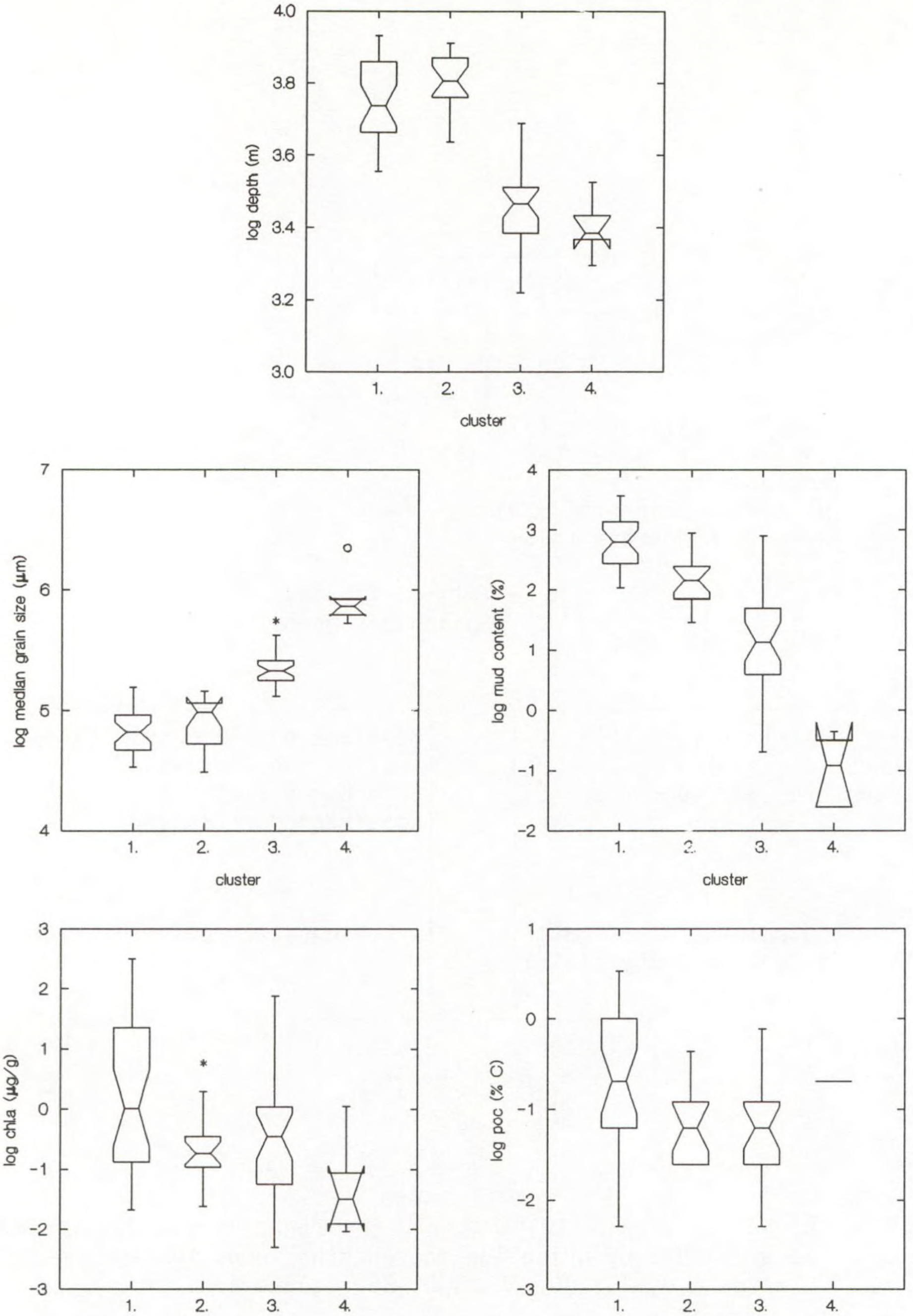


Fig. 47a. **Box and whisker plots of the average abiotic parameters (log(x+1)-transformed) after TWINSPAN analysis using the data of the macrobenthic density (ind./m²) (cf. Figs. 45, 46 and Table 11).**

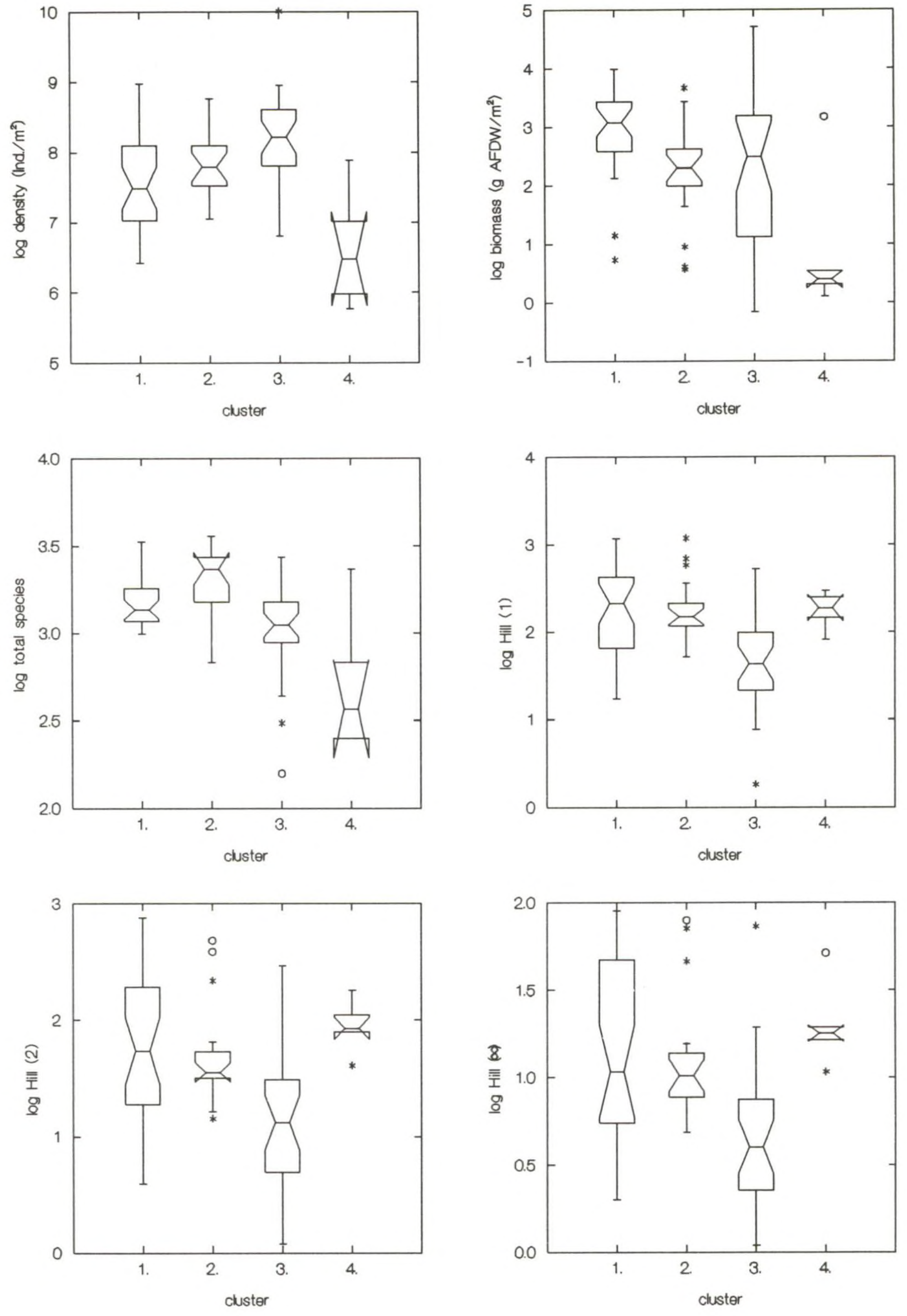


Fig. 47b. Box and whisker plots of some average macrobenthic parameters (log(x+1)-transformed after TWINSPAN analysis using the data of the macrobenthic density (ind./m²) (cf. Figs. 45, 46 and Table 11).

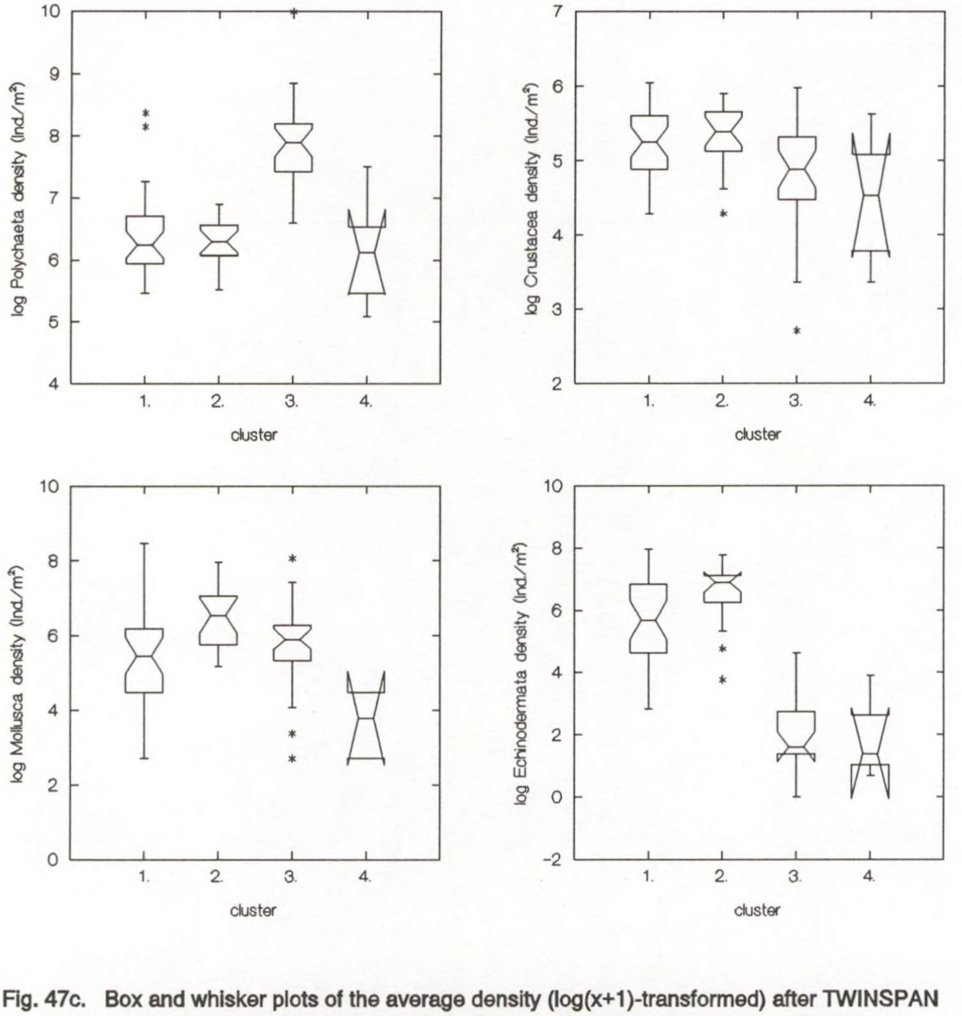


Fig. 47c. **Box and whisker plots of the average density (log(x+1)-transformed) after TWINSPAN analysis using the data of the macrobenthos density (ind./m²) (cf. Figs. 45, 46 and Table 11).**

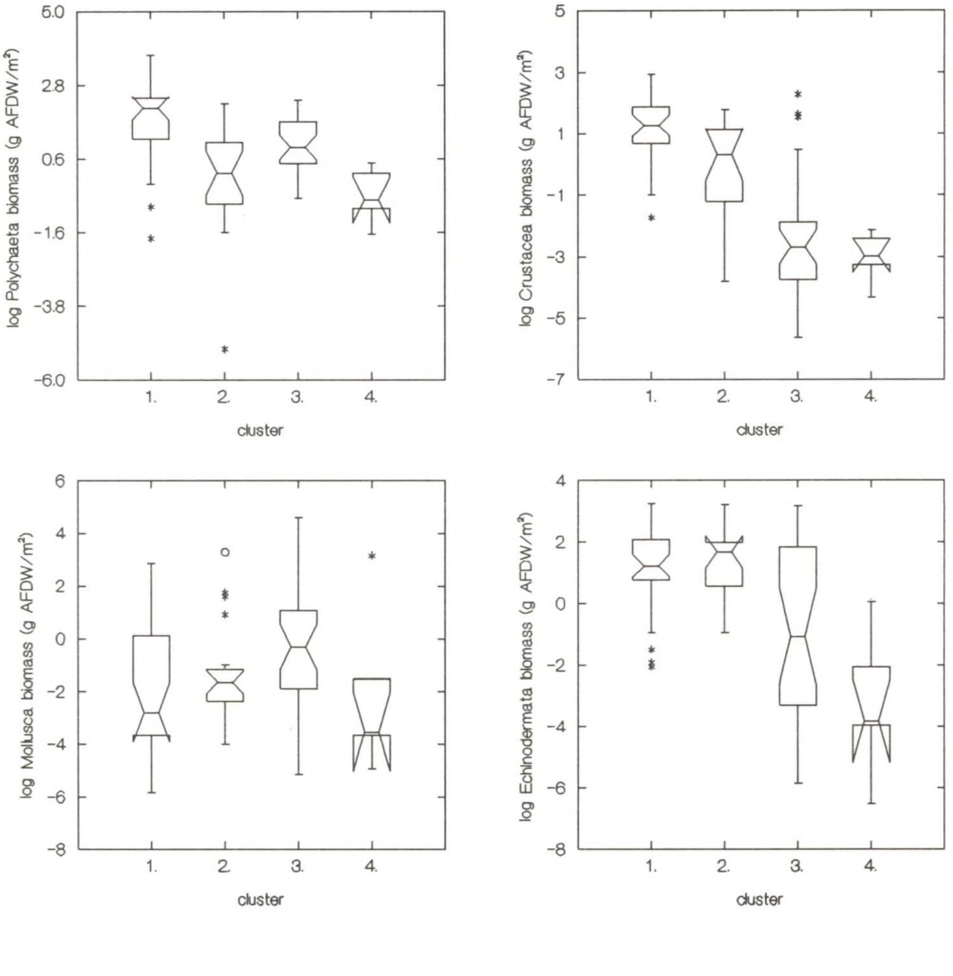


Fig. 47d. Box and whisker plots of the average biomass (log(x+1)-transformed) after TWINSPAN analysis using the data of the macrobenthos density (ind./m²) (cf. Figs. 45, 46 and Table 11).

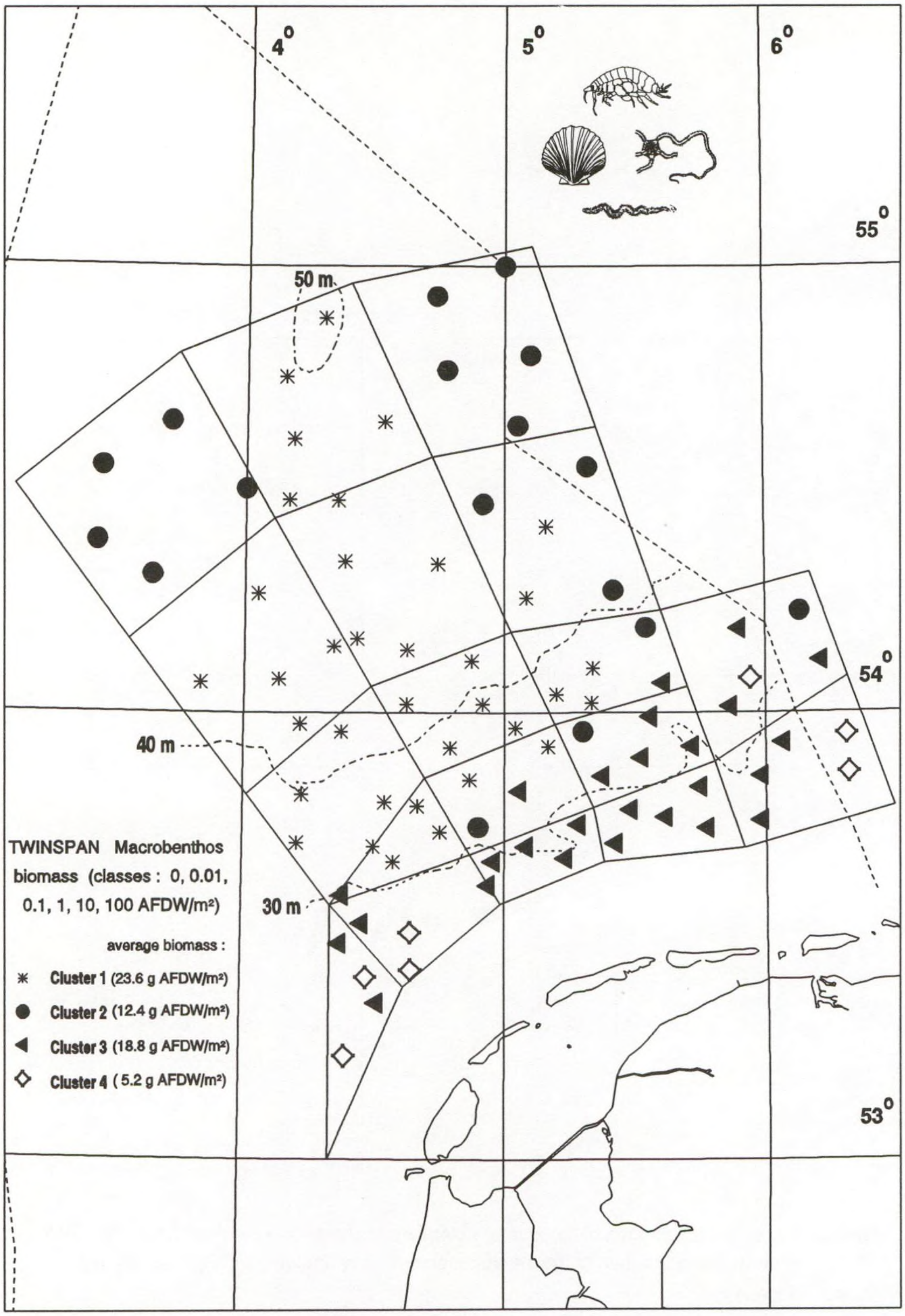


Fig. 48. TWINSPAN clustering of the macrobenthos biomass (g AFDW/m²).

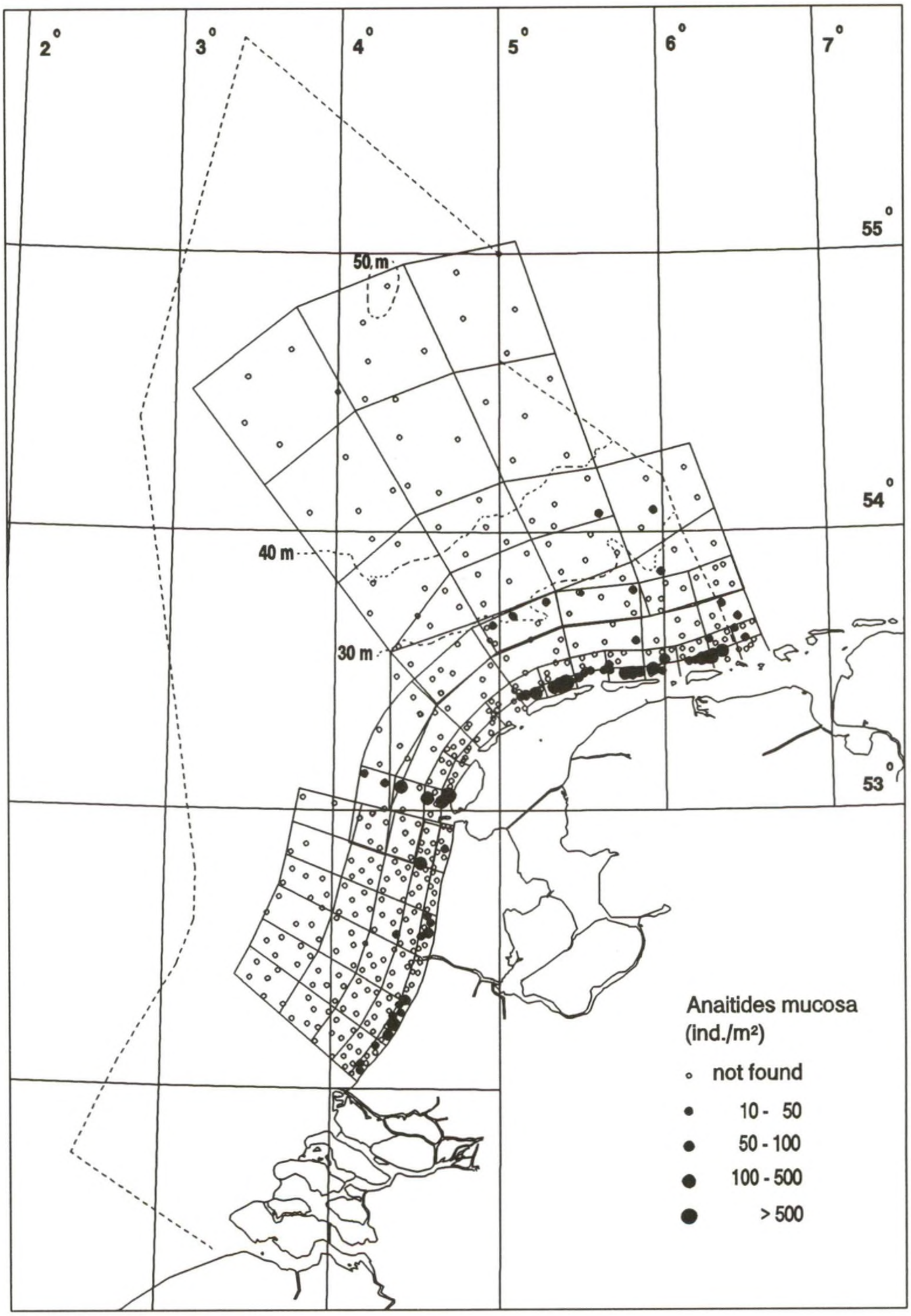


Fig. 49. Spatial distribution (ind./m²) of the polychaeta Anaitides mucosa.

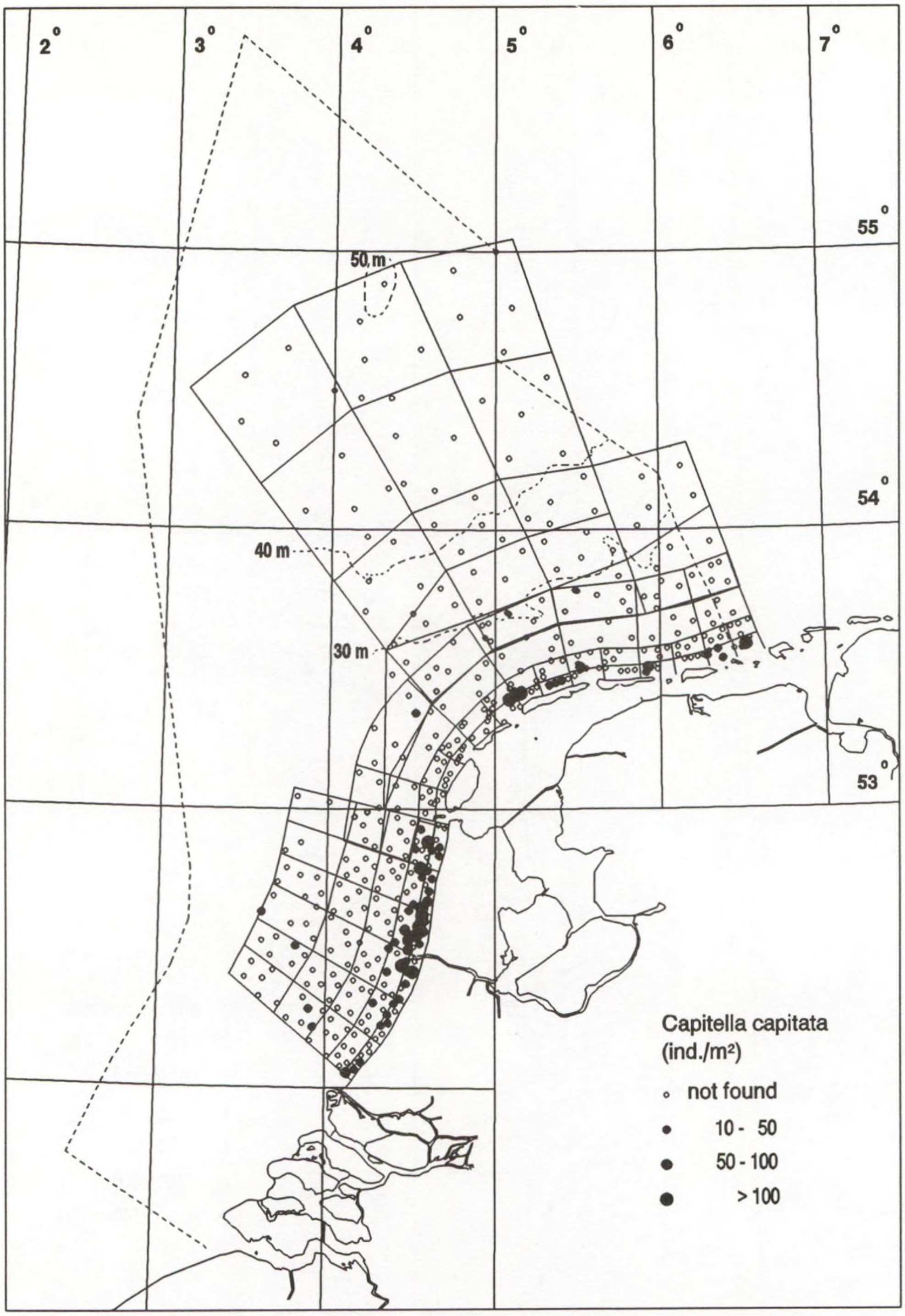


Fig. 50. Spatial distribution (ind./m²) of the Polychaeta Capitella capitata.

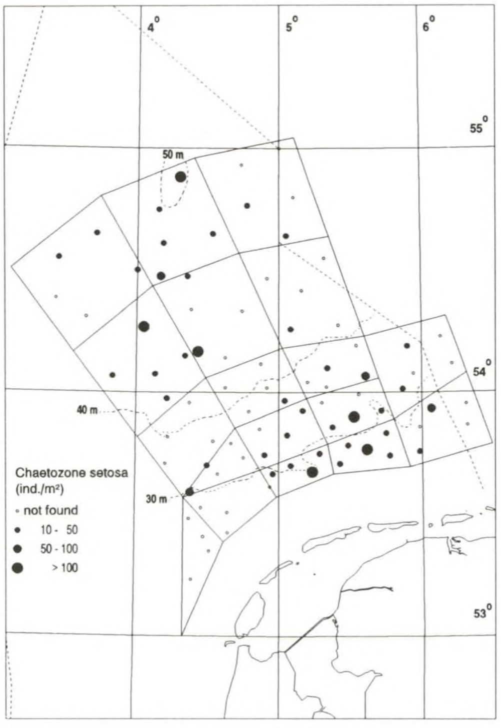


Fig. 51. Spatial distribution (ind./m²) of the Polychaeta Chaetozone setosa.

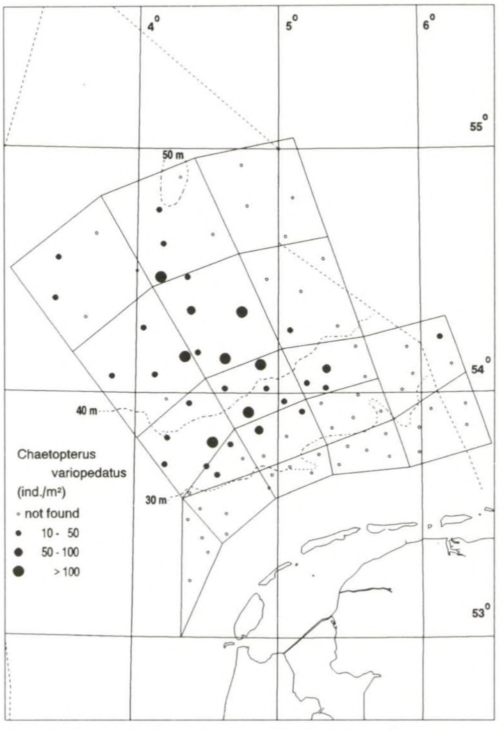


Fig. 52. Spatial distribution (ind./m²) of the Polychaeta Chaetopterus variopedatus.

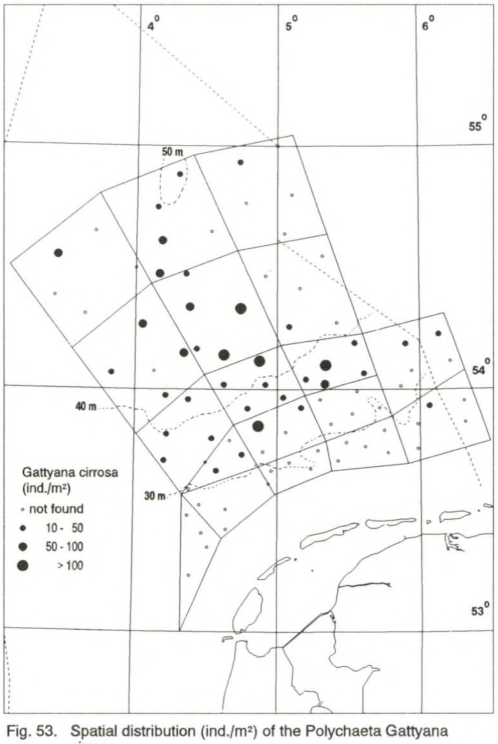


Fig. 53. Spatial distribution (ind./m²) of the Polychaeta Gattyana cirrosa.

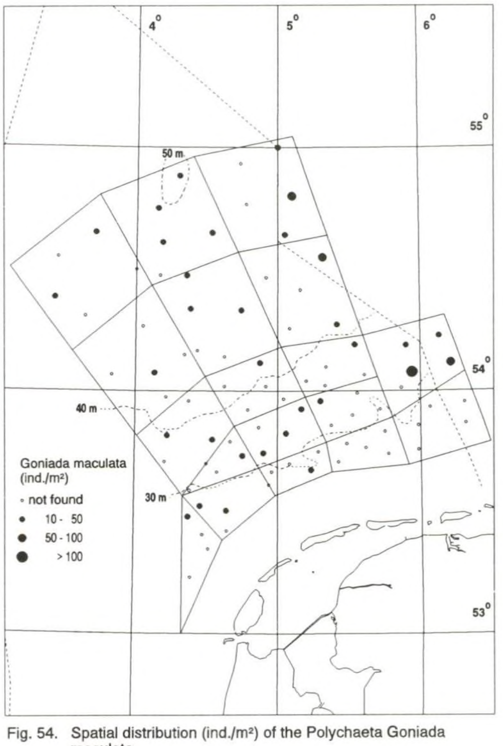


Fig. 54. Spatial distribution (ind./m²) of the Polychaeta Goniada maculata.

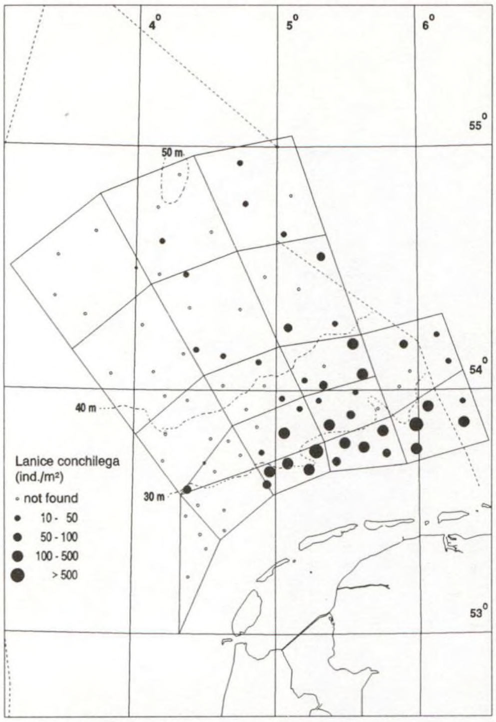


Fig. 55. Spatial distribution (ind./m²) of the Polychaeta Lanice conchilega.

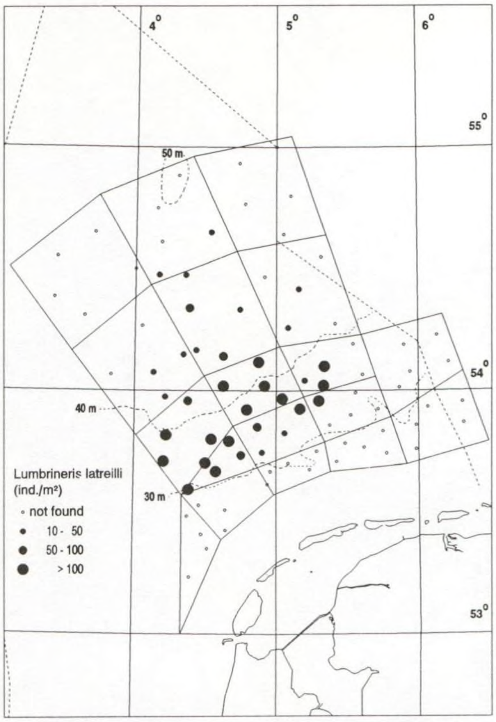


Fig. 56. Spatial distribution (ind./m²) of the Polychaeta Lumbrineris latreilli.

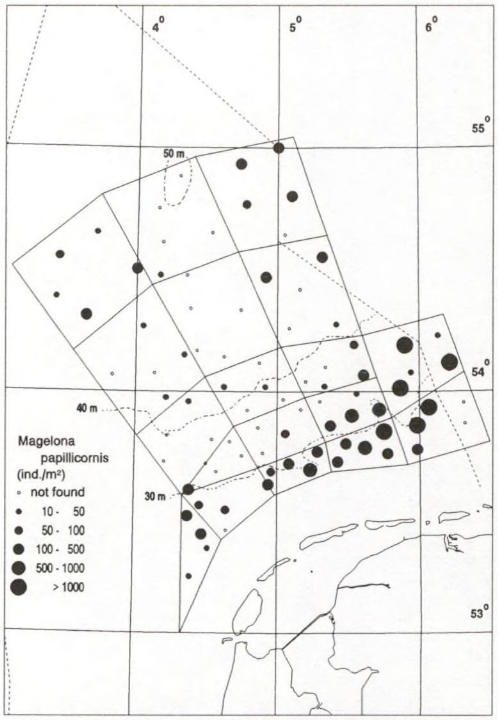


Fig. 57. Spatial distribution (ind./m²) of the Polychaeta Magelona papillicornis.

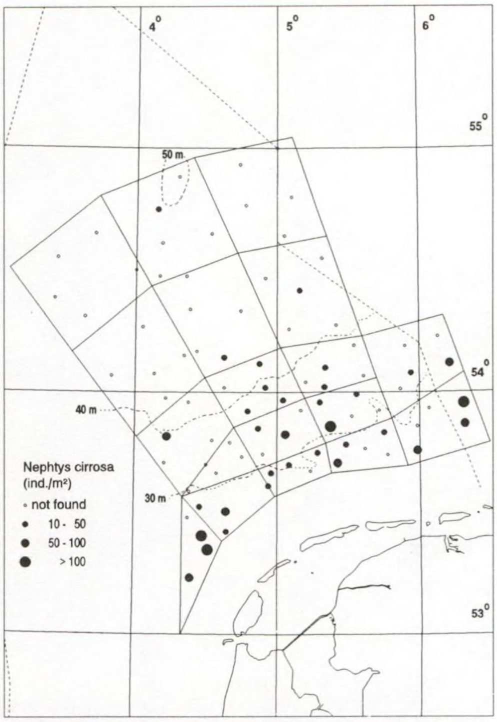


Fig. 58. Spatial distribution (ind./m²) of the Polychaeta Nephtys cirrosa.

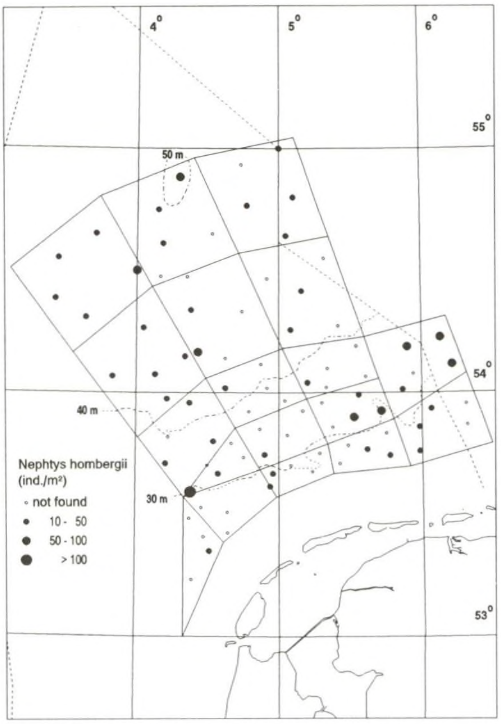


Fig. 59. Spatial distribution (ind./m²) of the Polychaeta Nephtys hombergii.

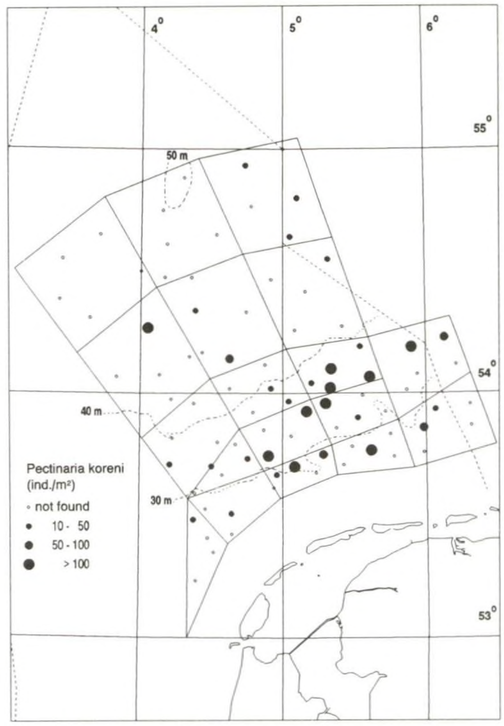


Fig. 60. Spatial distribution (ind./m²) of the Polychaeta Pectinaria koreni.

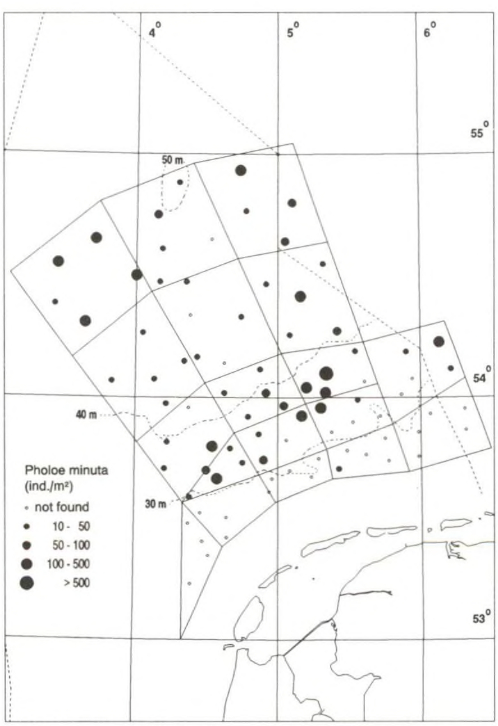


Fig. 61. Spatial distribution (ind./m²) of the Polychaeta Pholoe minuta.

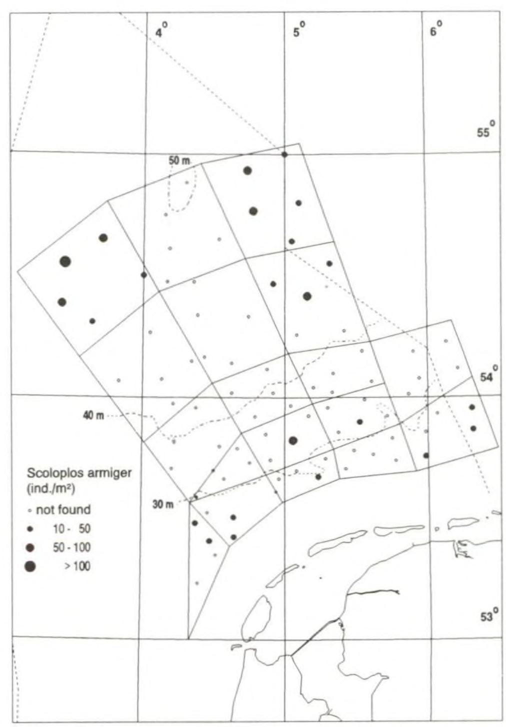


Fig. 62. Spatial distribution (ind./m²) of the Polychaeta Scoloplos armiger.

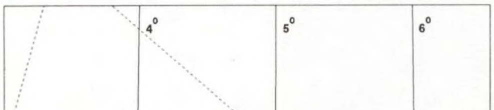


Fig. 63. Spatial distribution (ind./m²) of the Polychaeta Spiophanes bombyx.

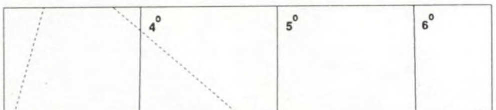


Fig. 64. Spatial distribution (ind./m²) of the Mollusca Abra alba.

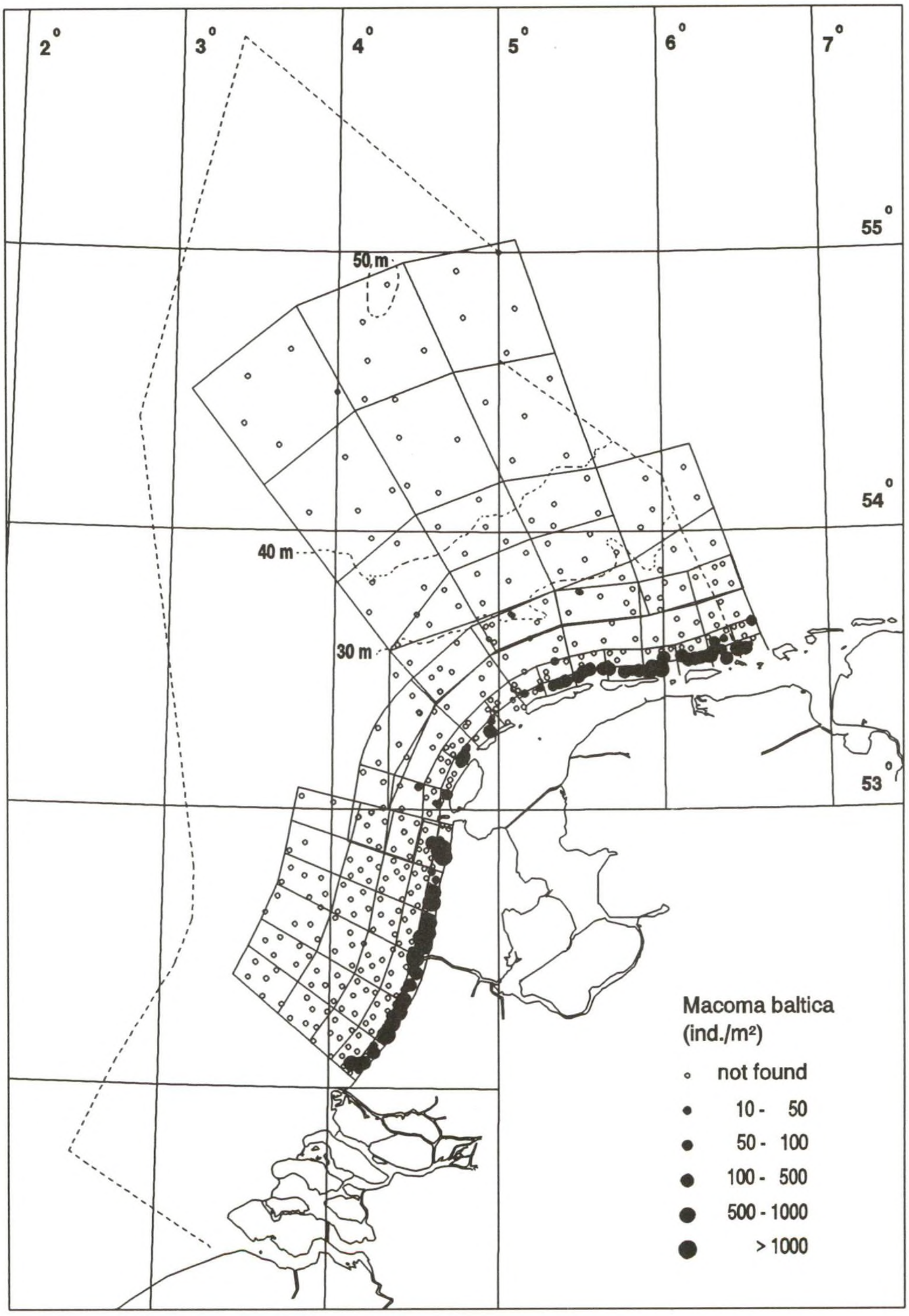


Fig. 65. Spatial distribution (ind./m²) of the Mollusca Macoma baltica.

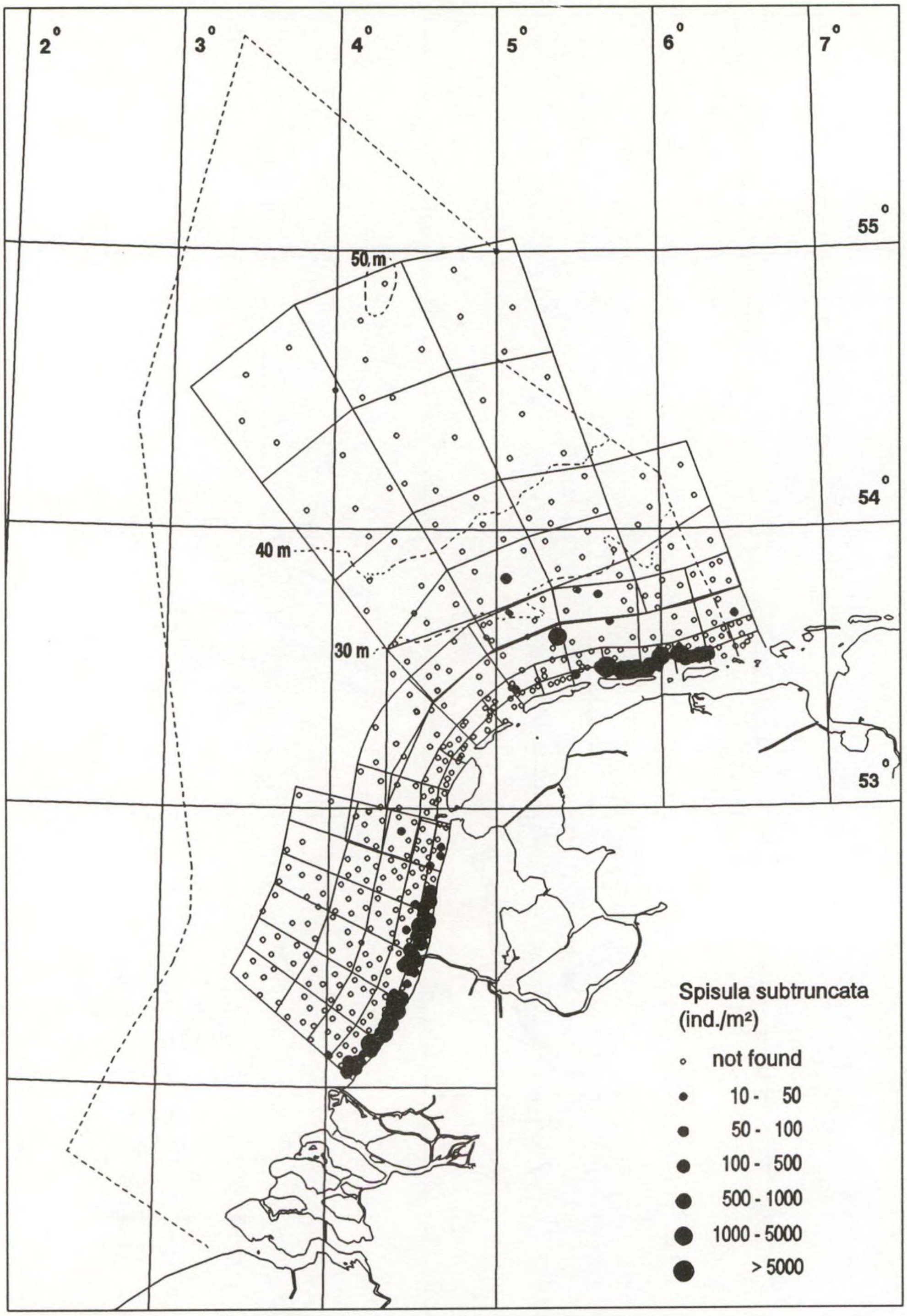


Fig. 66. Spatial distribution (ind./m²) of the Mollusca Spisula subtruncata.

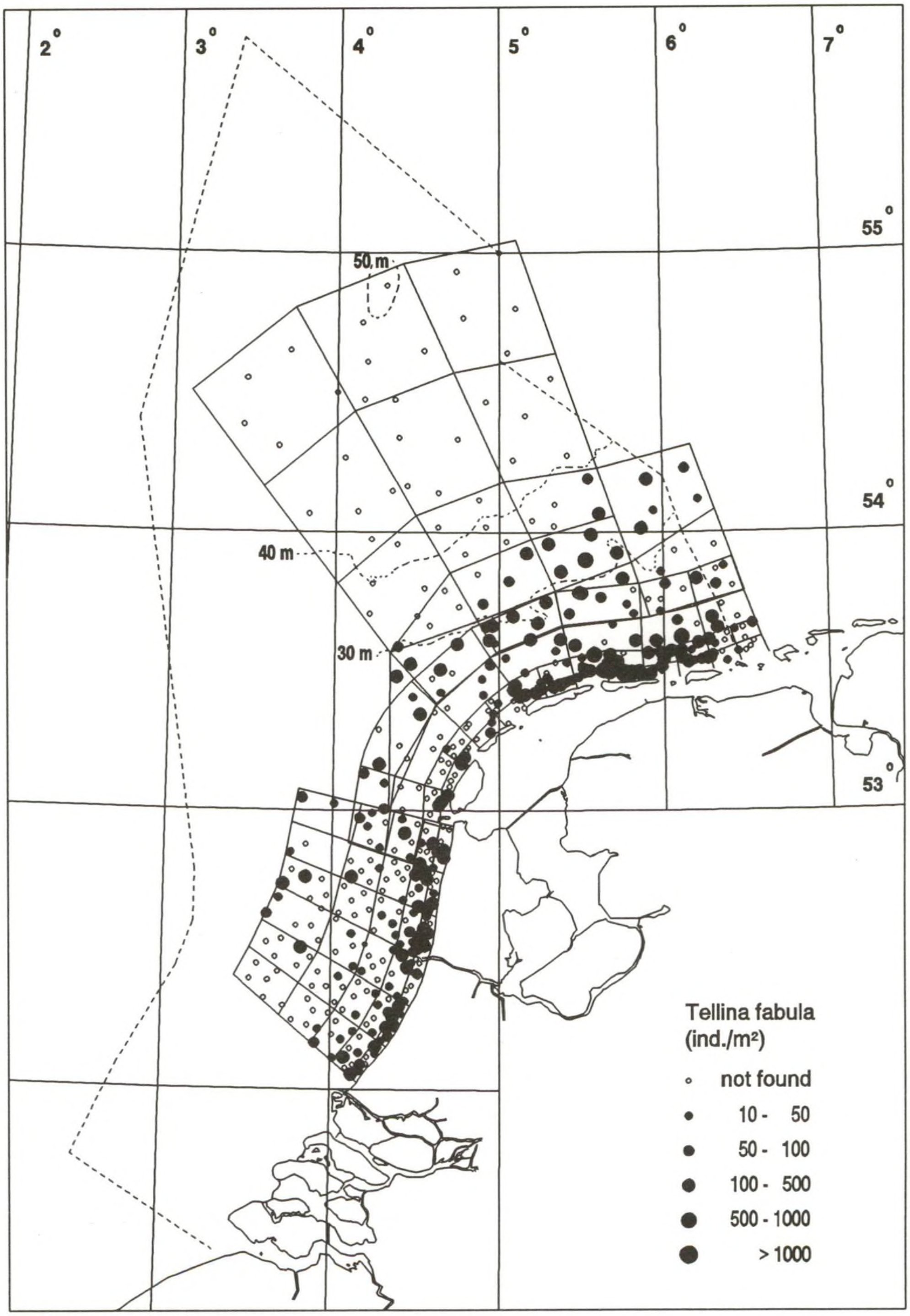


Fig. 67. Spatial distribution (ind./m²) of the Mollusca Tellina fabula.

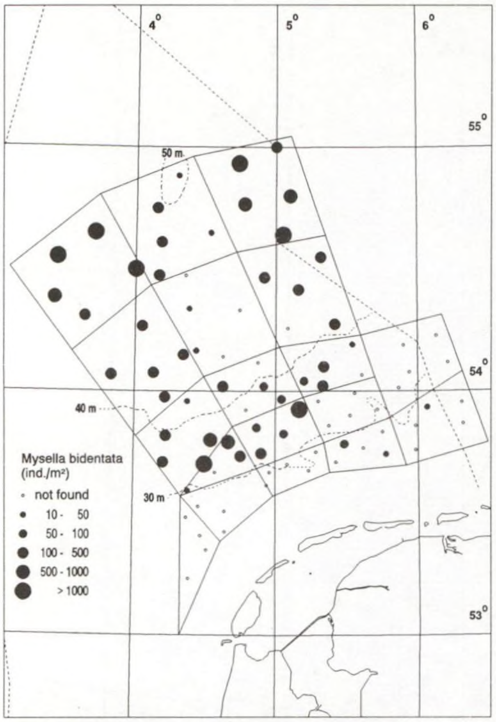


Fig. 68. Spatial distribution (ind./m²) of the Mollusca Mysella bidentata.

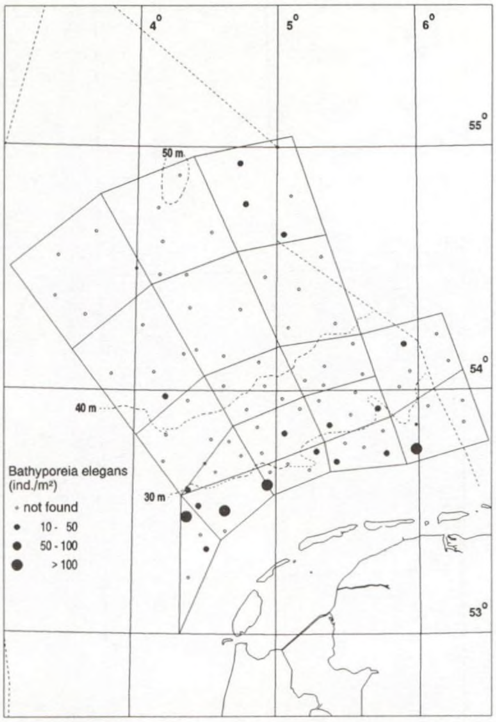


Fig. 69. Spatial distribution (ind./m²) of the Crustacea Bathyporeia elegans.

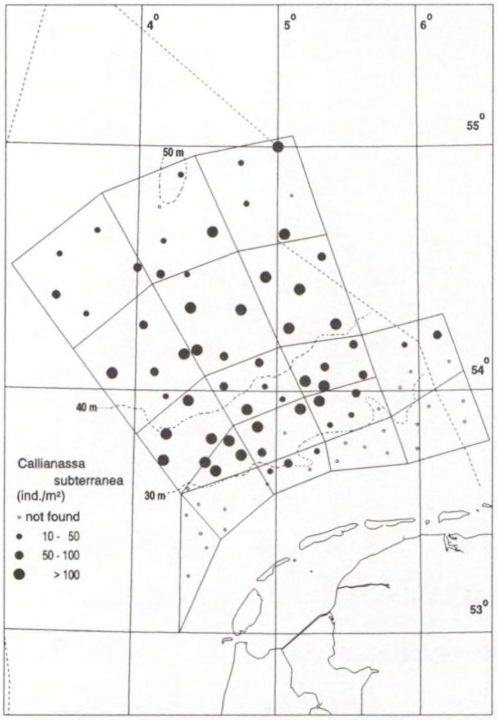


Fig. 70. Spatial distribution (ind./m²) of the Crustacea Callianassa subterranea.

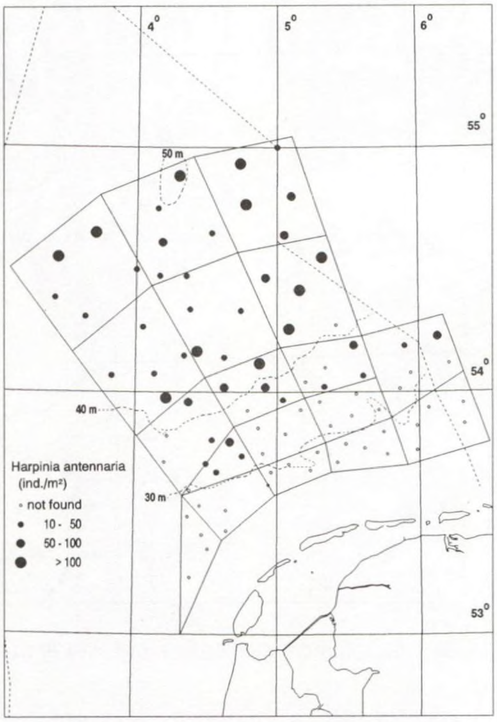


Fig. 71. Spatial distribution (ind./m²) of the Crustacea Harpinia antennaria.

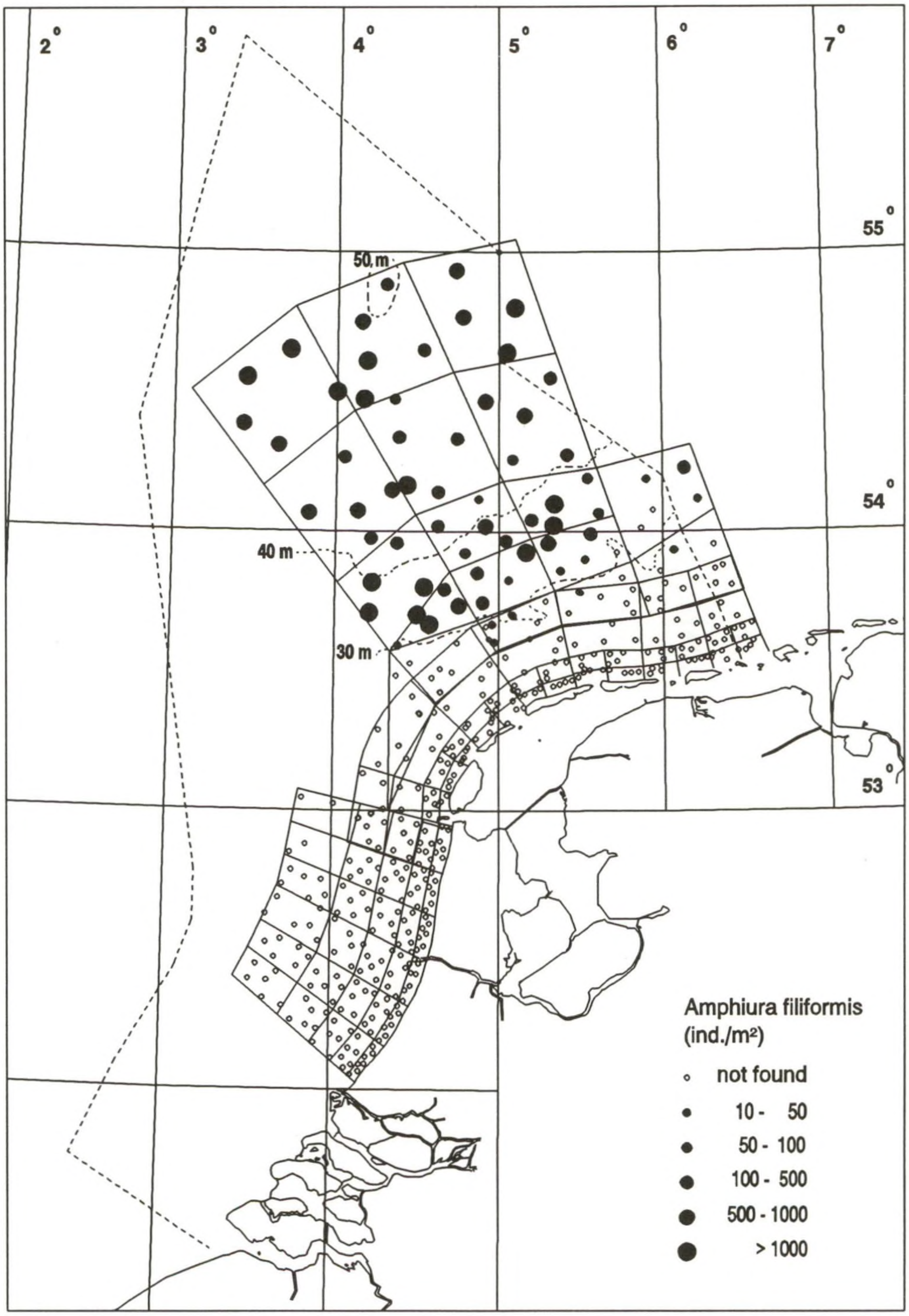


Fig. 72. Spatial distribution (ind./m²) of the Echinodermata Amphiura filiformis.

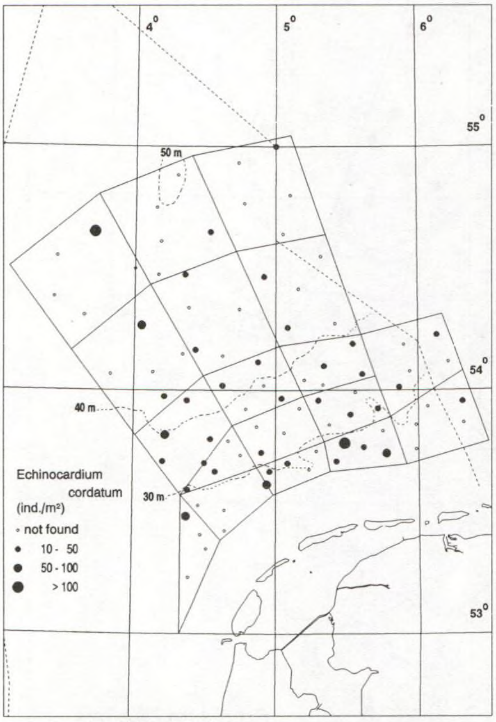


Fig. 73. Spatial distribution (ind./m²) of the Echinodermata Echinocardium cordatum.

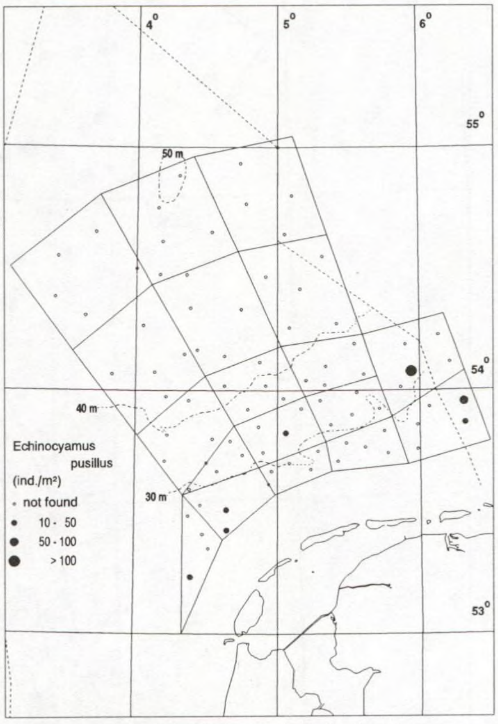


Fig. 74. Spatial distribution (ind./m²) of the Echinodermata Echinocyamus pusillus.

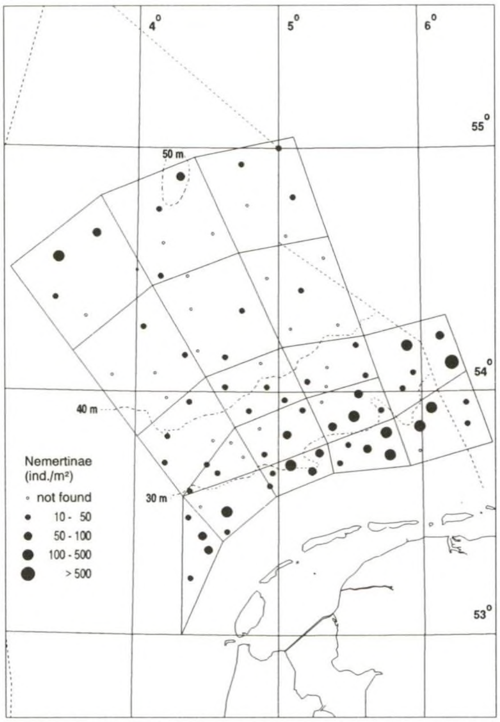


Fig. 75. Spatial distribution (ind./m²) of the Nemertinae.

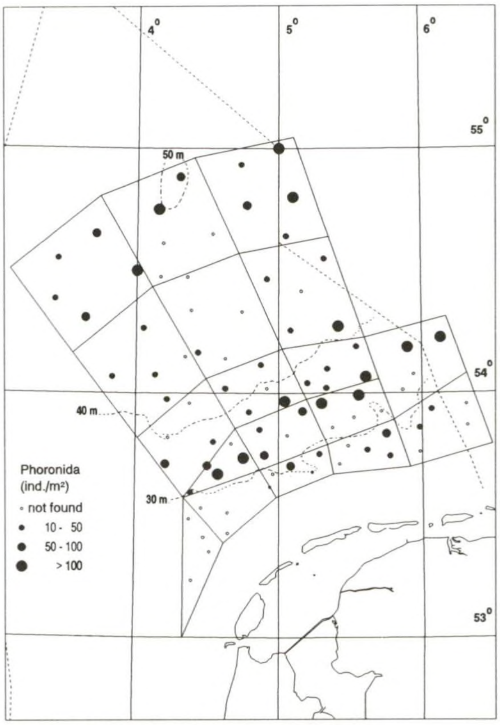


Fig. 76. Spatial distribution (ind./m²) of the Phoronida.

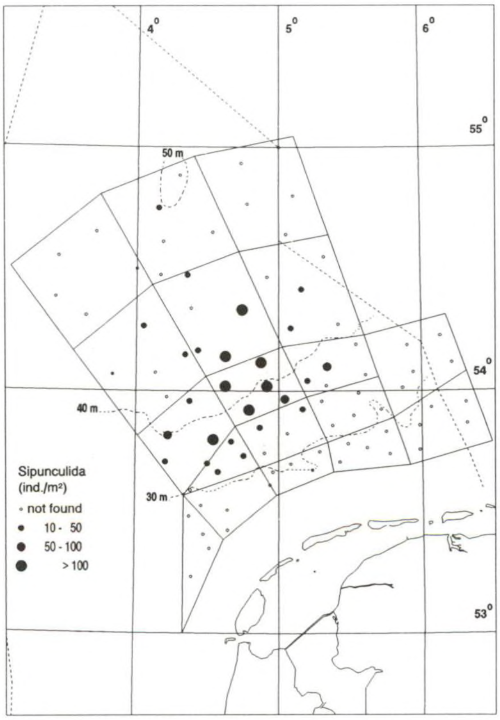


Fig. 77. Spatial distribution (ind./m²) of the Sipunculida.

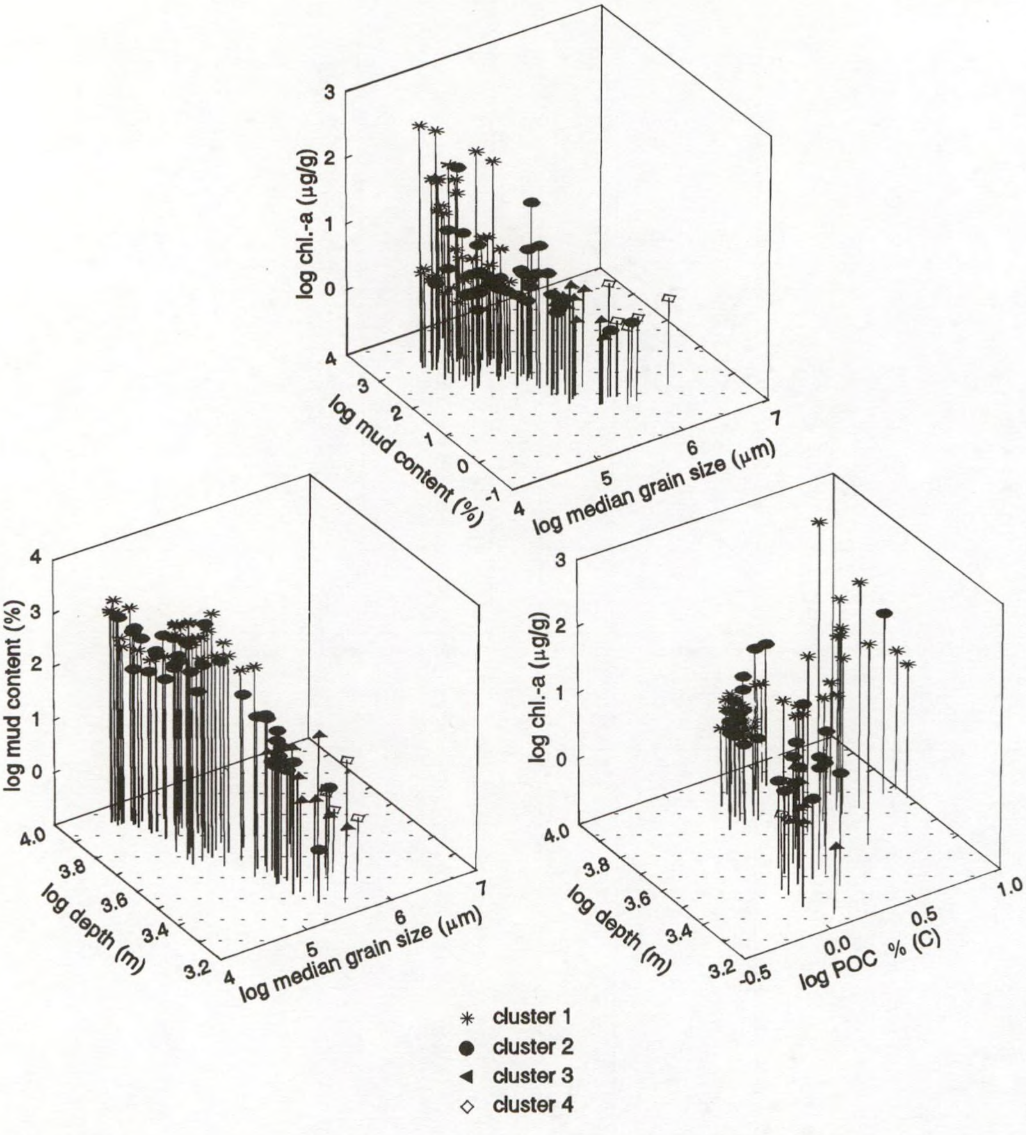


Fig. 78. Correlations between abiotic parameters and TWINSPAN clusters of the meiobenthos density (ind./10 cm^2) (cf. Figs. 28, 29 and Table 6).

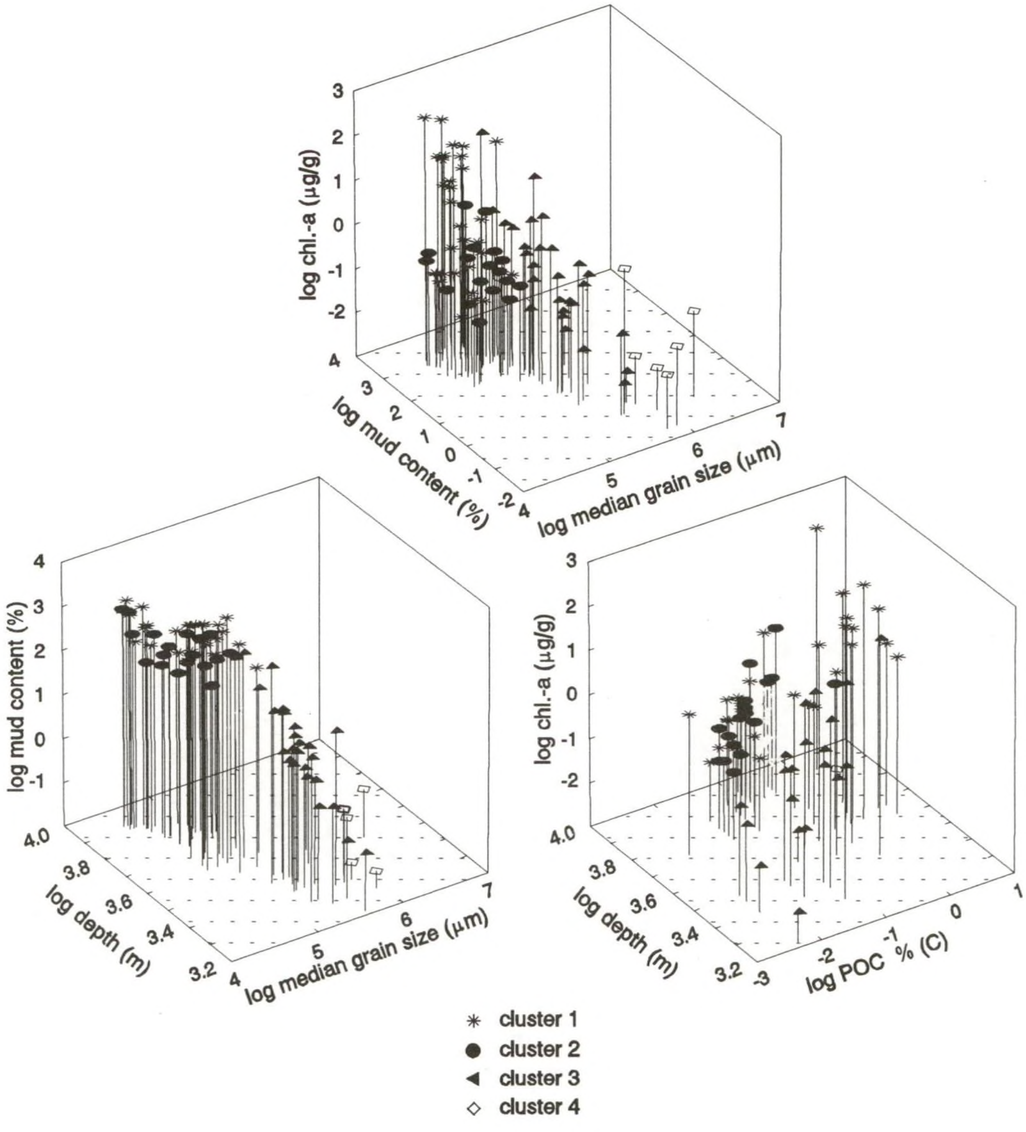


Fig. 79. Correlations between abiotic parameters and TWINSPAN clusters of the macrobenthos density (ind./m²) (cf. Figs. 45, 46 and Table 11).

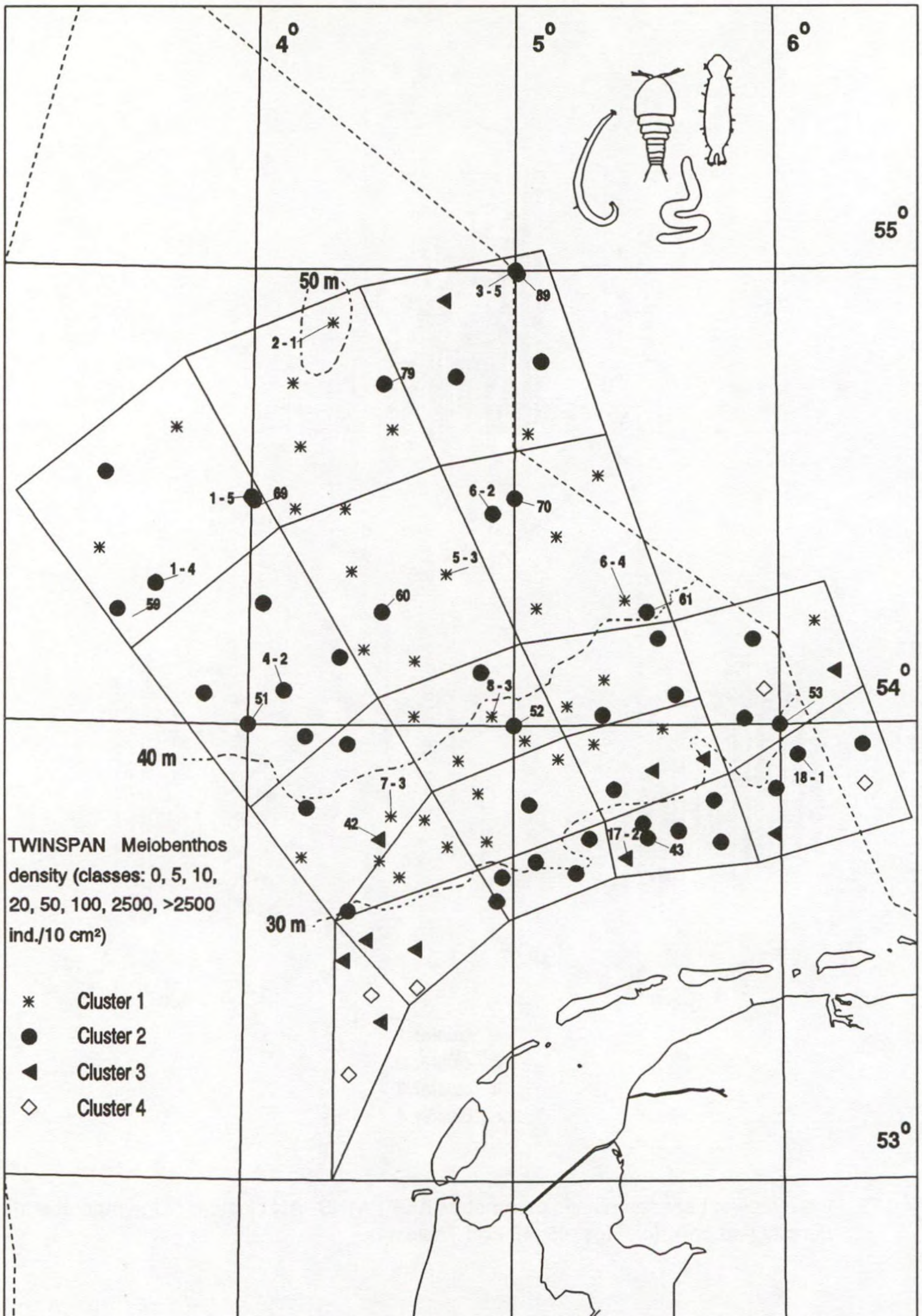


Fig. 80. TWINSPAN clustering of the meiobenthos density (ind./10 cm²) including the ICES data of 1986 (cf. Table 17).

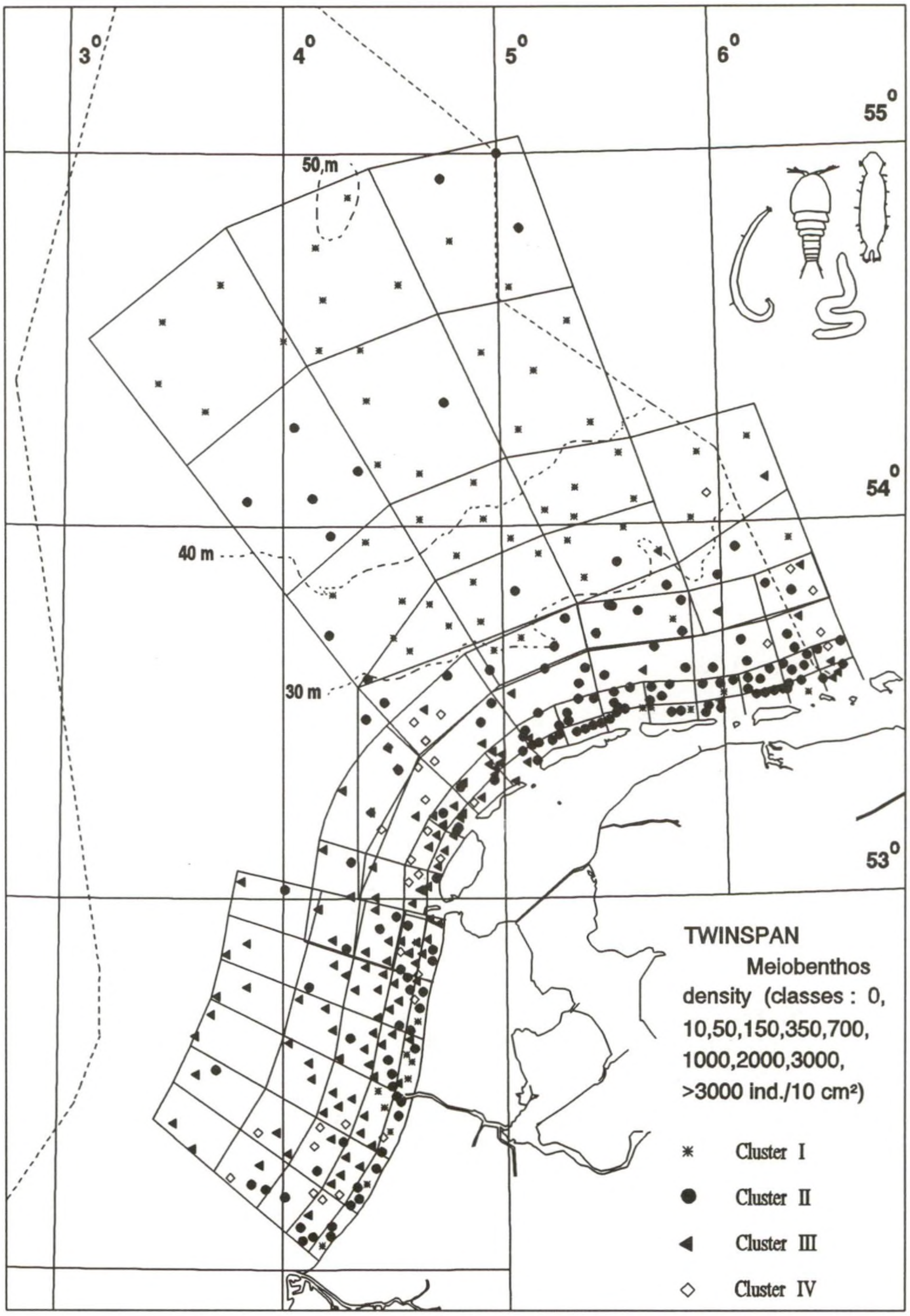


Fig. 81. TWINSPAN clustering of the meiobenthos density (ind./10 cm²) including the MILZON-BENTHOS I data of 1988 and 1989.

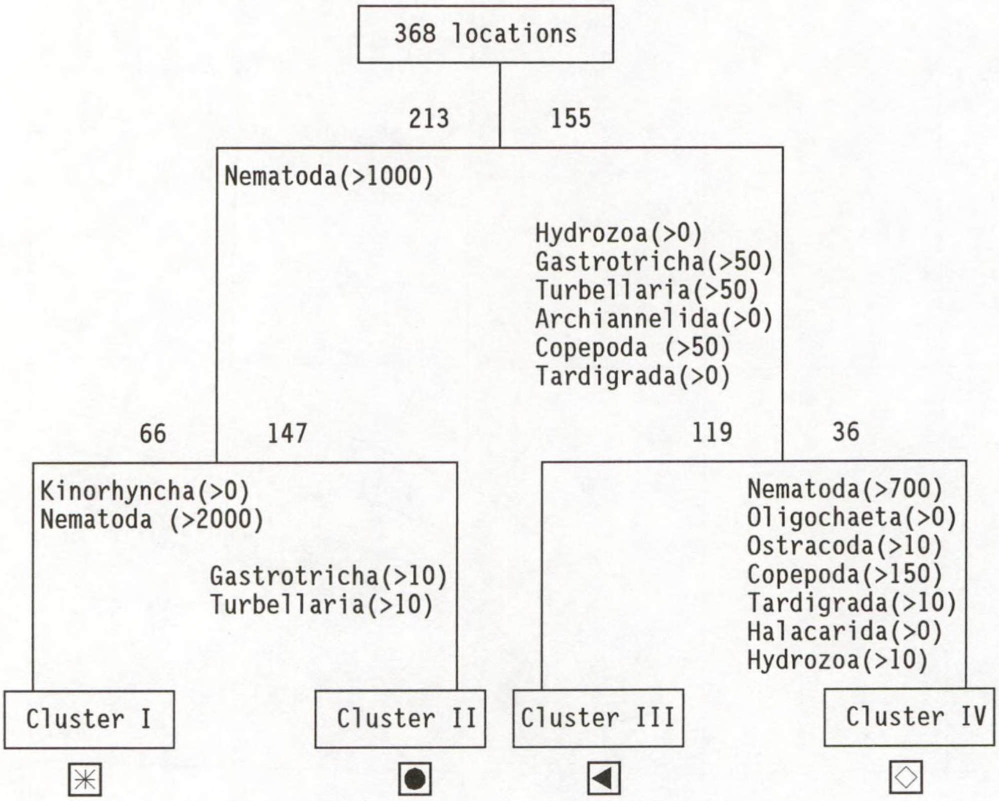


Fig. 82. Dichotomy of the TWINSPAN clusters of the whole MILZON-BENTHOS area of 1988, 1989 and 1991 by using the meiobenthos density (ind./10 cm^2).
Classes: 0, 10, 50, 150, 350, 700, 1000, 2000, 3000, >3000 ind./10 cm^2

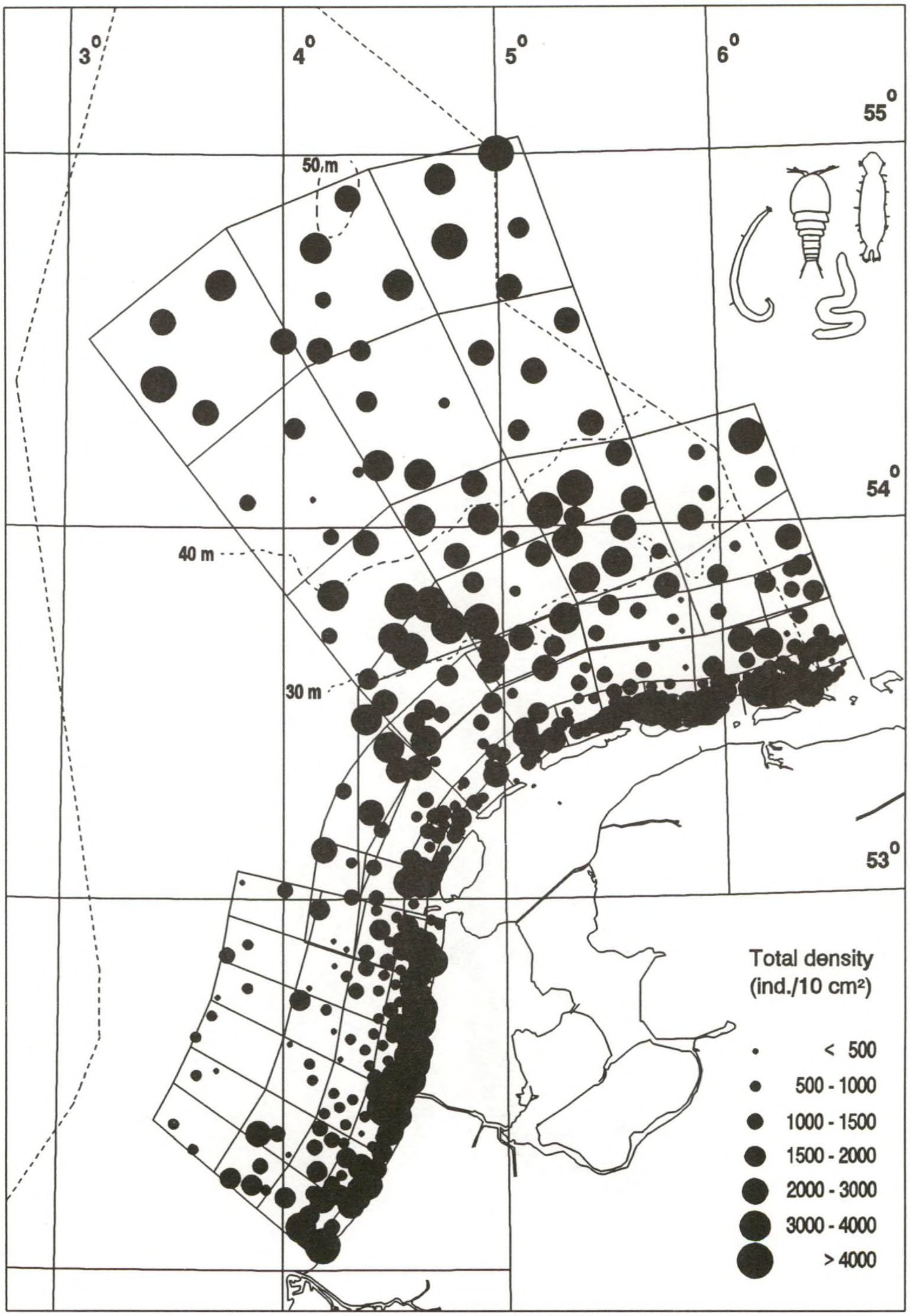


Fig. 83a. Spatial distribution of the total meiobenthic density (ind./10 cm²) including the MILZON-BENTHOS I data of 1988 and 1989.

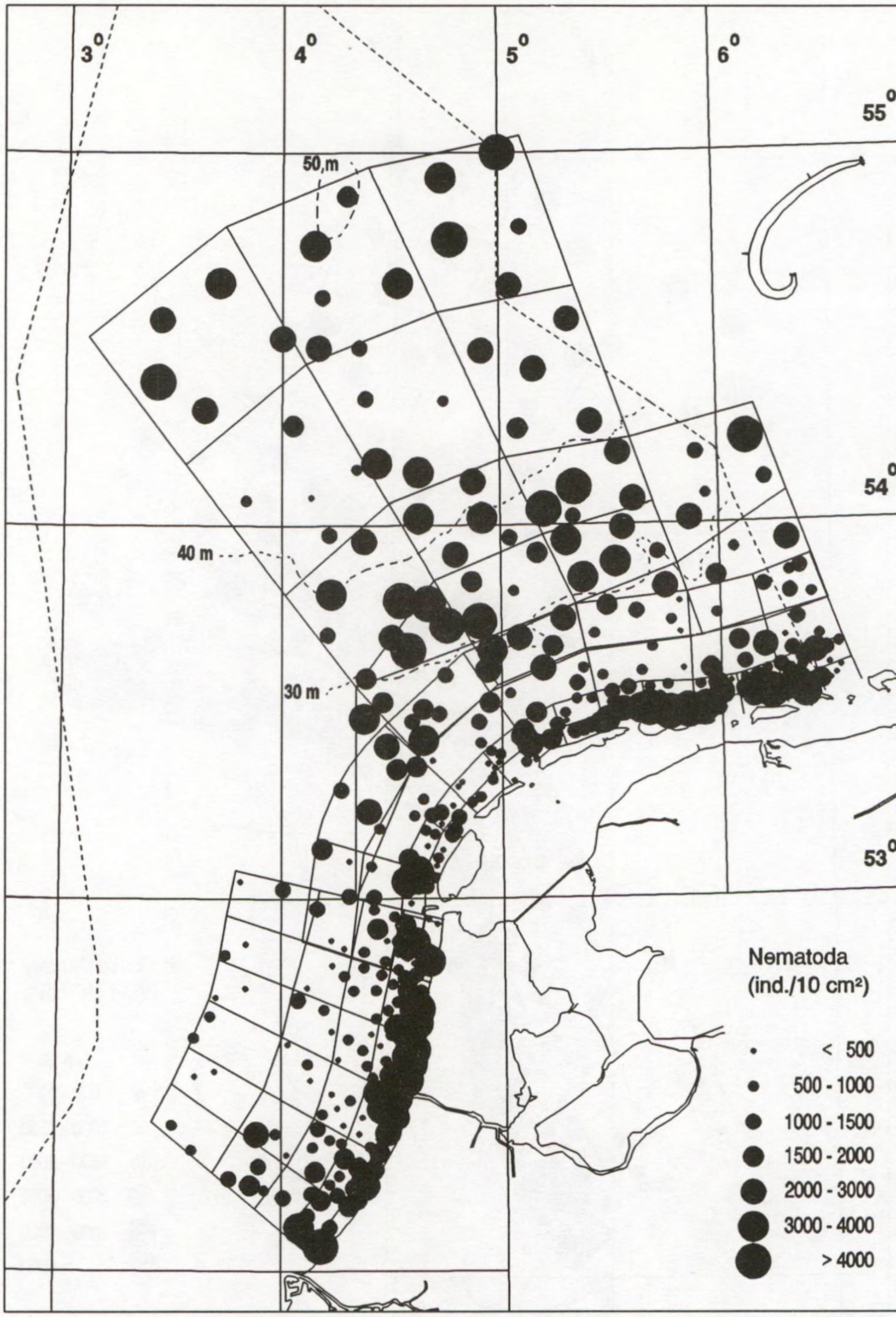


Fig. 83b. Spatial distribution of the Nematoda (ind./10 cm²) including the MILZON-BENTHOS I data of 1988 and 1989.

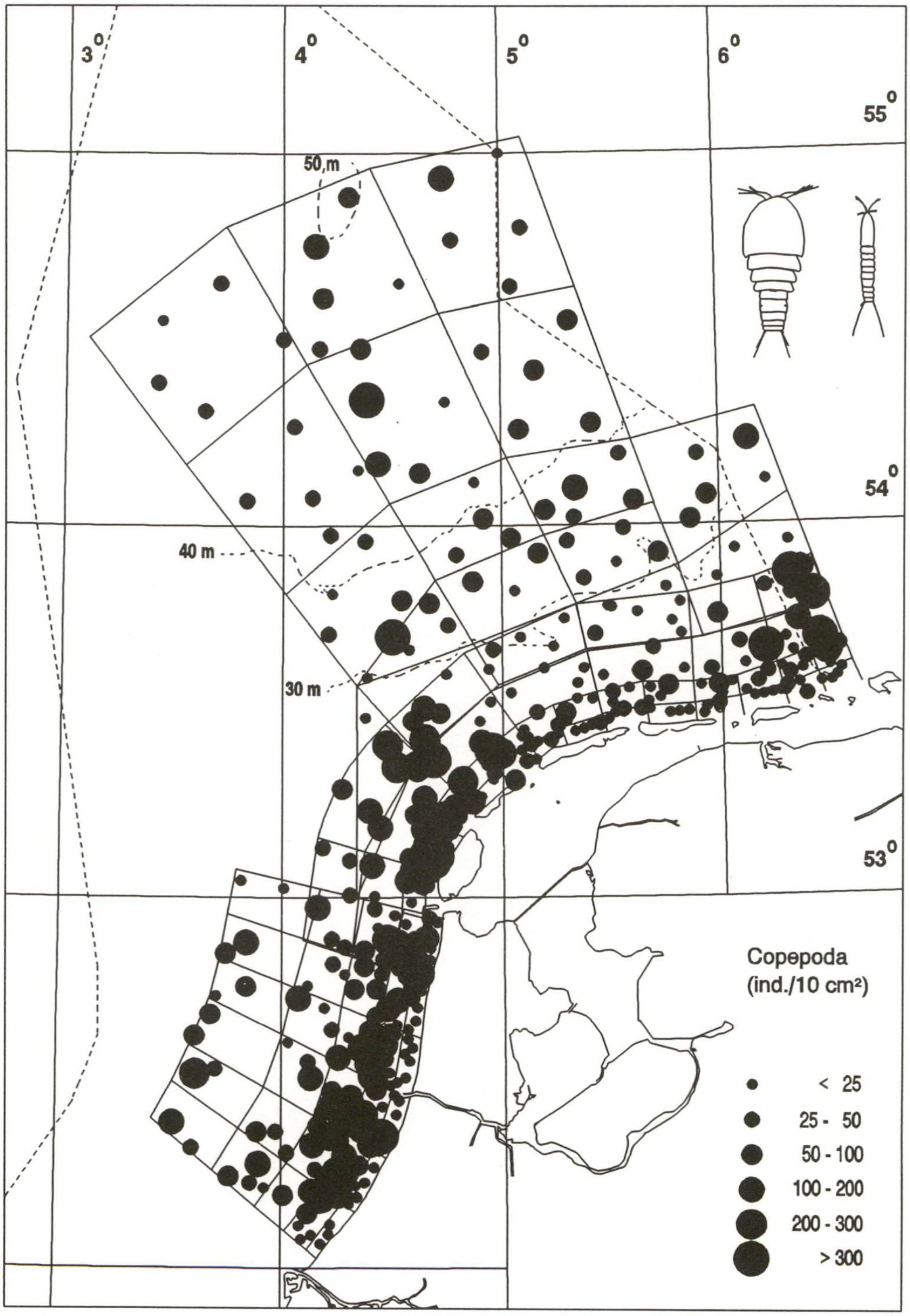


Fig. 83c. Spatial distribution of the Copepoda (ind./10 cm²) including the MILZON-BENTHOS I data of 1988 and 1989.

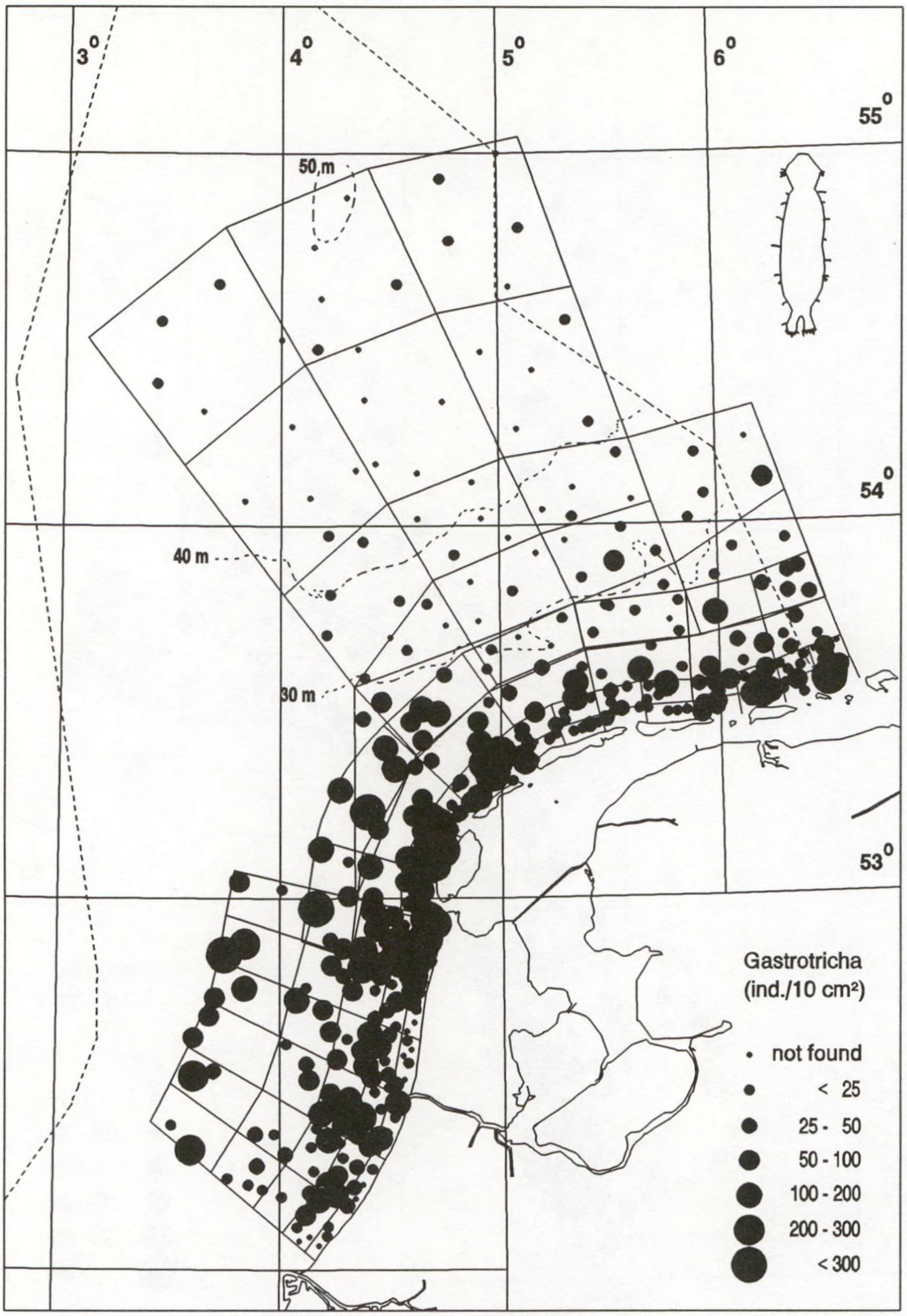


Fig. 83d. Spatial distribution of the Gastrotricha (ind./10 cm²) including the MILZON-BENTHOS I data of 1988 and 1989.

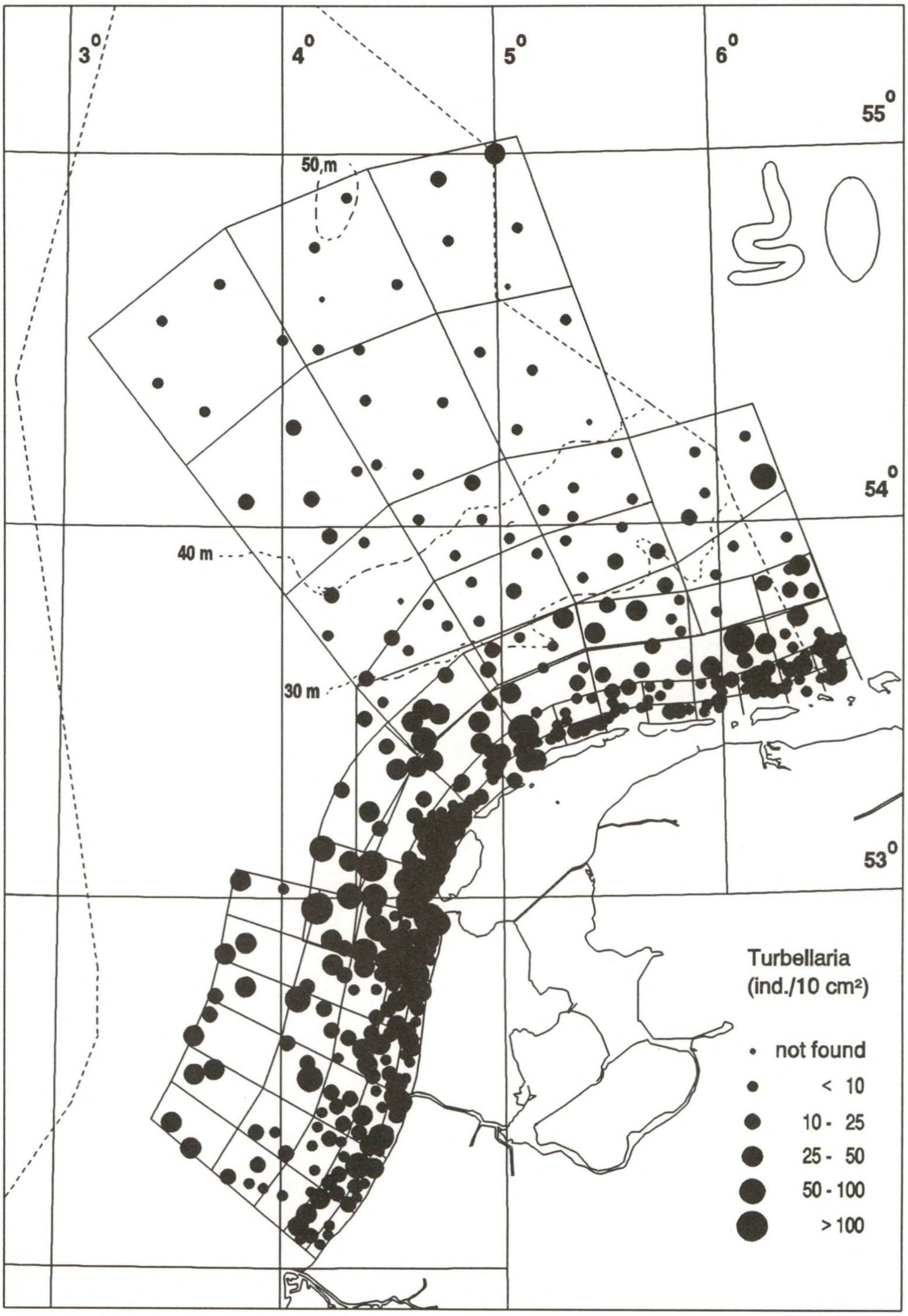


Fig. 83e. Spatial distribution of the Turbellaria (ind./ 10 cm²) including the MILZON-BENTHOS I data of 1988 and 1989.

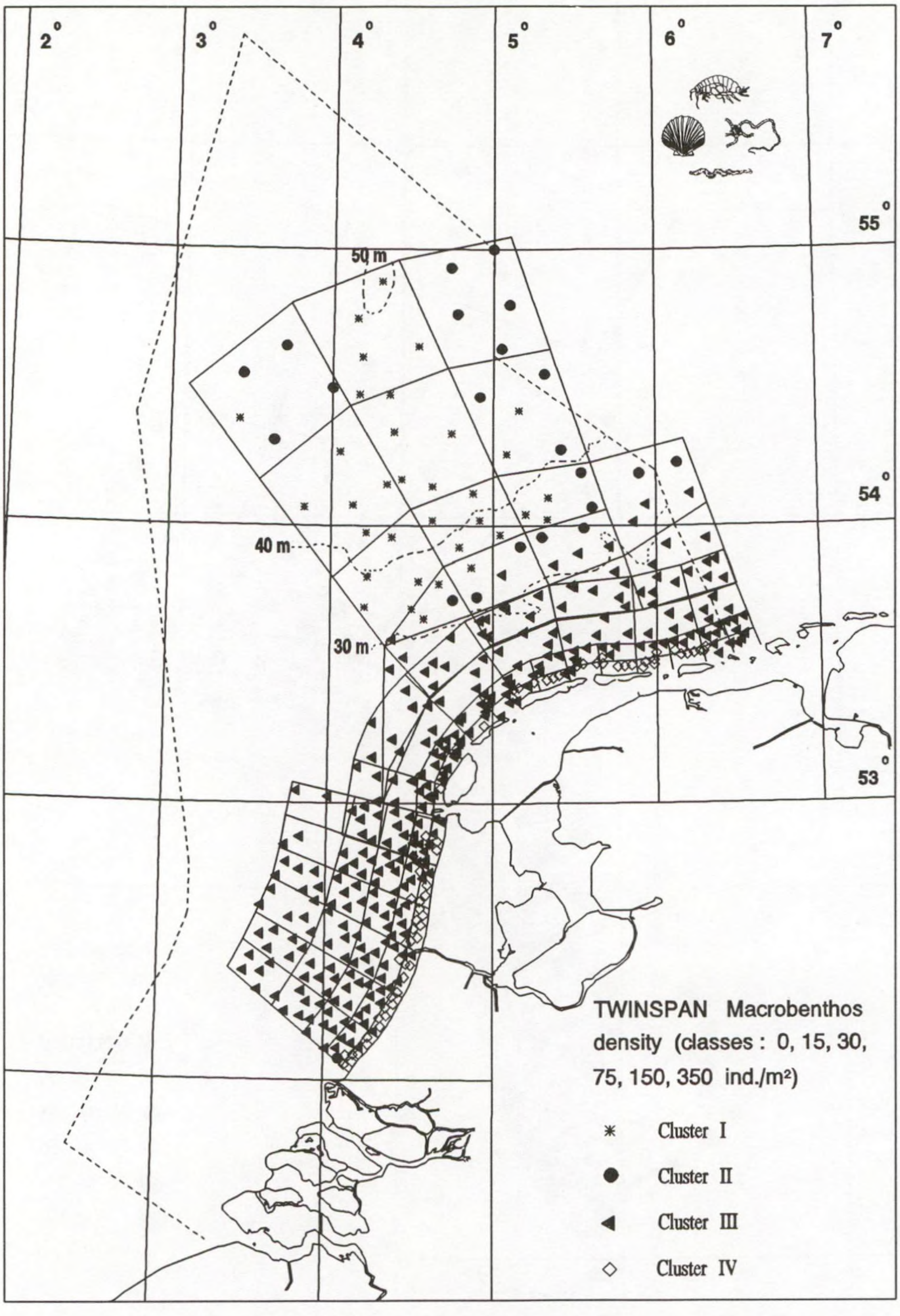


Fig. 84. TWINSPAN clustering of the macrobenthos density (ind./m²) including the MILZON-BENTHOS I data of 1988 and 1989.

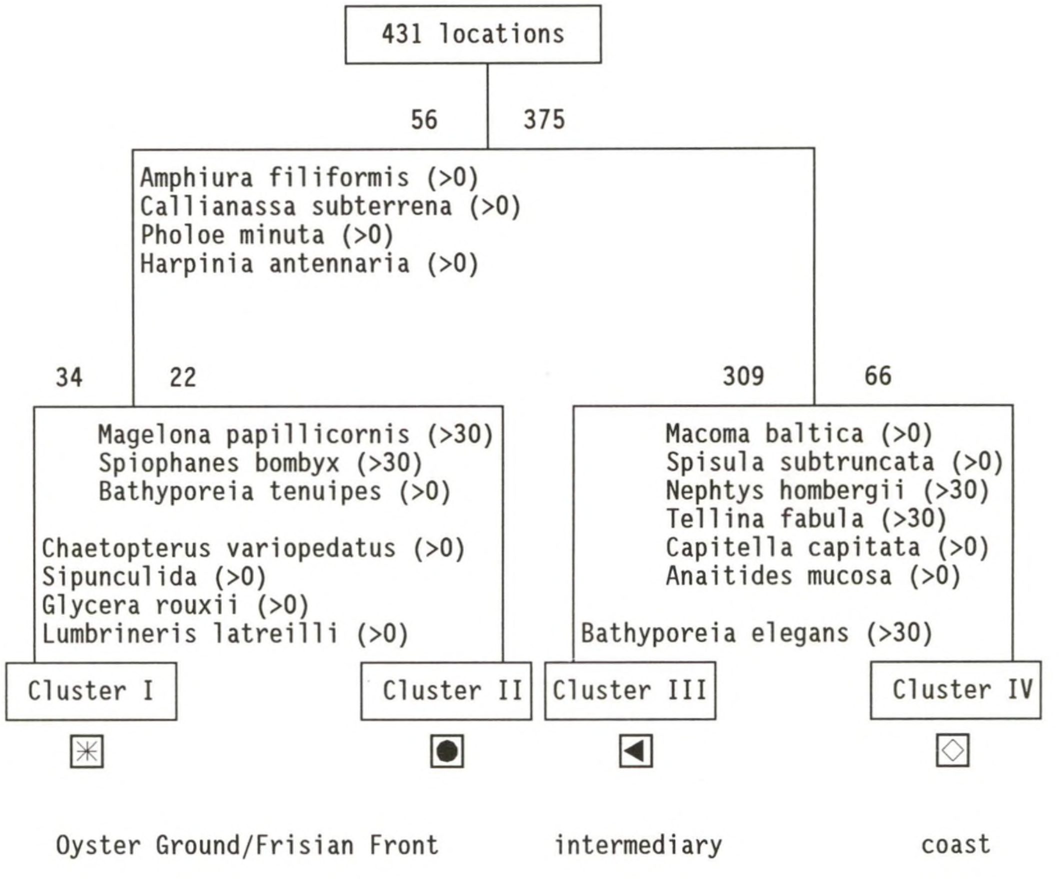


Fig. 85. Dichotomy of the TWINSPAN cluster of the whole MILZON-BENTHOS area of 1988, 1989 and 1991 by using the macrobenthos density (ind./m^2).
Classes : 0, 15, 30, 75, 150, 350 ind./m^2

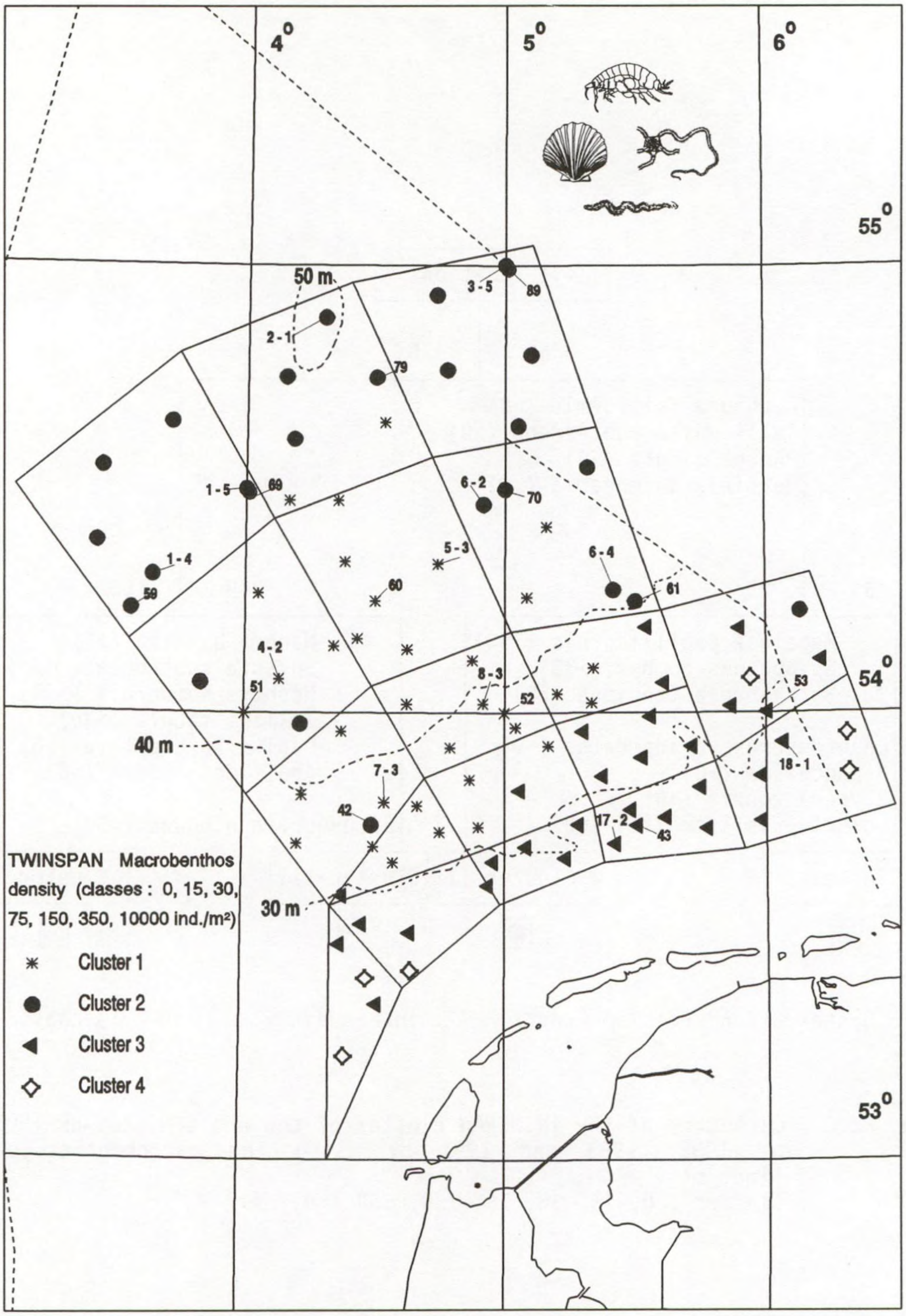


Fig. 86. TWINSPAN clustering of the macrobenthos density (ind./m²) including the ICES data of 1986 (cf. Table 17).

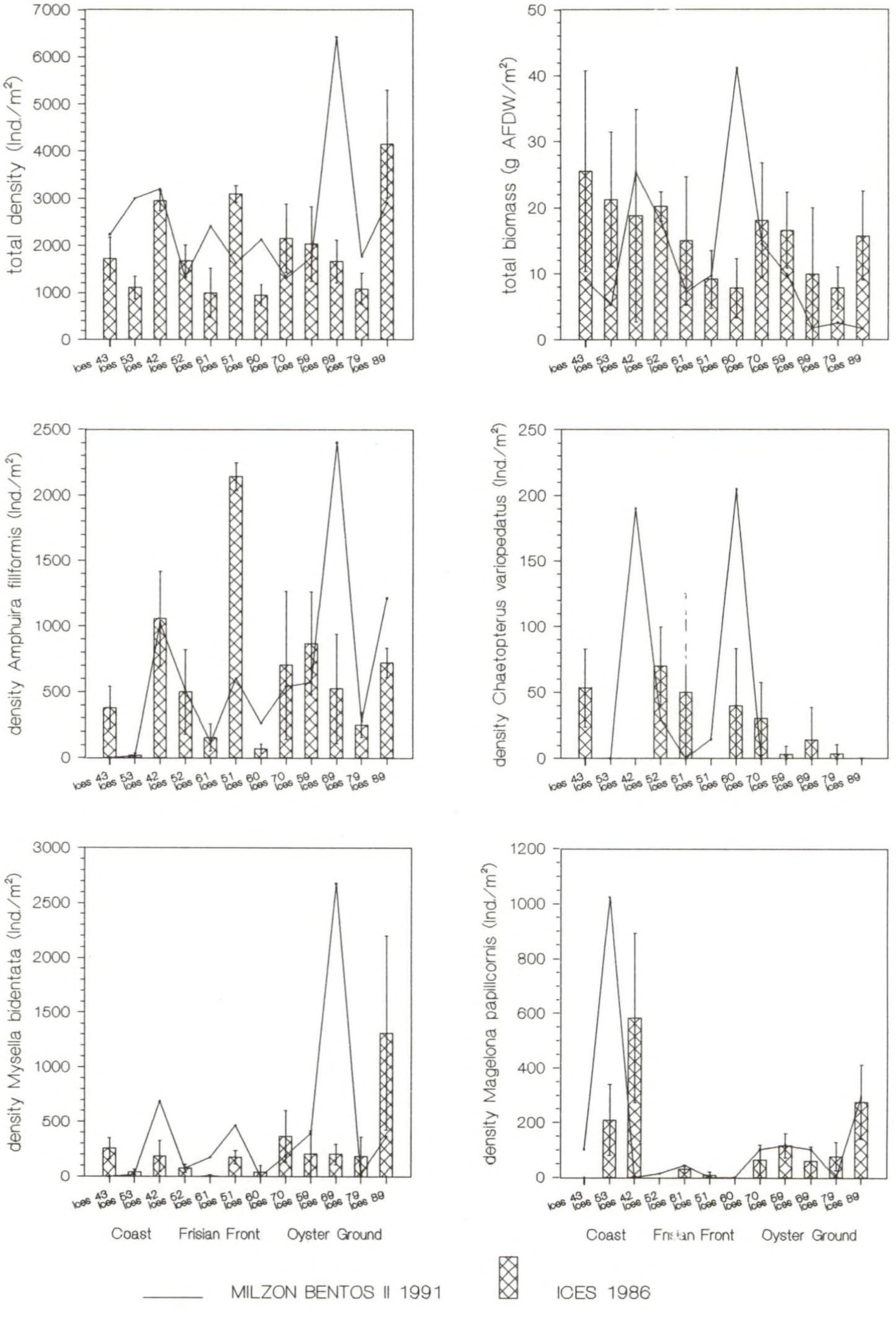


Fig. 87a. Comparing of the MILZON-BENTHOS II (1991) and the ICES (1986) data (cf. Fig. 86 and Table 17).

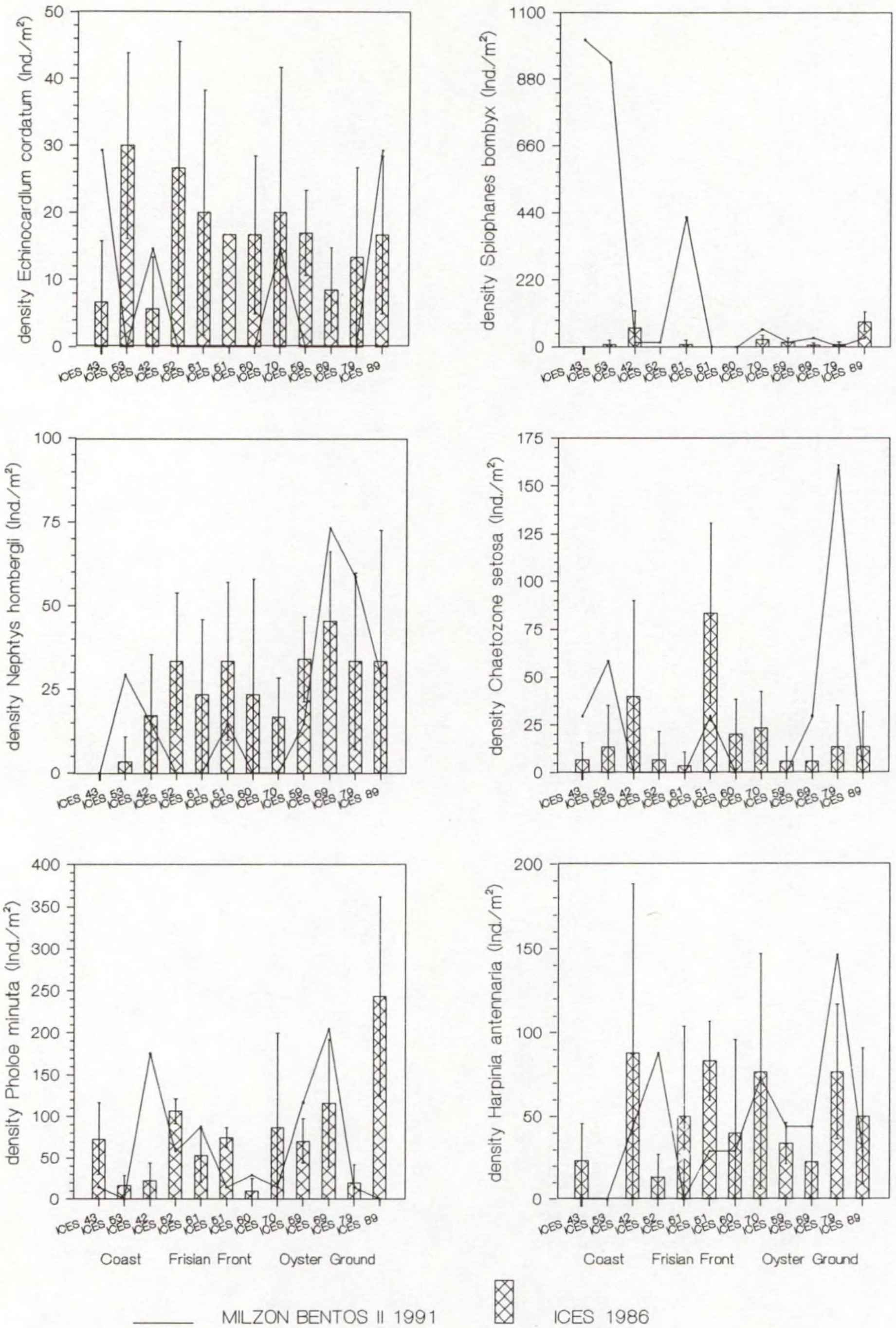


Fig. 87b. Comparing of the MILZON-BENTHOS II (1991) and the ICES (1986) data (cf. Fig. 86 and Table 17).

Appendices

Appendix 1-1. Densities of meiobenthic taxa (true and temporary) on all MILZON-BENTHOS II 1991 locations. Densities of the EXP*BMN stations 1-5 (SM30) and 3-5 (SM58) are given in Huys & De Smet (1992).

Station	1-1	1-2	1-3	1-4	2-1	2-2	2-3	2-4	2-5	3-1	3-2	3-3	3-4
True													
Nematoda	3799	2459	7564	2561	1926	3336	3530	1187	2039	3156	1496	4436	2527
Copepoda	46	19	46	32	87	142	14	63	36	138	44	45	31
Gastrotricha	1	2	2	.	.	.	2	.	2	22	9	2	.
Turbellaria	1	8	5	6	5	2	1	.	4	23	1	9	.
Archiannelida	.	.	.	.	.	.	.	.	.	.	.	.	.
Oligochaeta	.	.	.	.	.	.	.	.	.	.	.	1	.
Polychaeta	2	11	3	3	2	8	1	2	1	2	3	.	1
Hydrozoa	.	.	.	.	.	1	.	.	.	1	.	.	.
Tardigrada	1	4	.	12	.	.	.	.	.	9	1	8	2
Ostracoda	16	2	3	2	22	27	14	15	7	1	1	2	4
Halacarida	.	.	.	.	.	.	.	.	.	.	.	1	.
Kinorhyncha	5	1	3	1	6	30	2	3	6	.	.	.	.
Priapulida	.	.	.	2	2	1	3	2	1	.	.	.	.
Temporary													
Nauplii	64	61	104	65	81	107	42	98	10	43	23	38	14
Bivalvia	4	3	6	3	5	11	2	4	9	1	.	.	8
Foraminifera	119	391	46	57	119	97	87	121	40	264	97	172	31
Isopoda	.	.	.	.	1	.	.	.	.	.	1	.	.
Cumacea	.	.	.	.	.	.	.	.	.	.	.	.	.
Nemertina	.	.	.	.	.	.	.	.	.	.	.	.	.
Tanaidacea	.	.	.	.	.	2	.	.	.	.	.	.	.
Amphipoda	.	.	.	.	.	.	1	.	.	.	.	.	.
Echinoidea	.	.	.	.	.	.	.	.	1	3	.	.	1
Ophiuroidea	.	1	.	.	.	.	.	.	.	.	.	.	2
Gastropoda	.	.	.	.	.	.	.	.	.	.	.	1	.
Cnidaria other	4	.	1	1	2	4	8	.	1	4	.	1	.
Bryozoa	2	.	4	.	.	.	.	.	.	1	.	.	3
Cladocera	.	.	.	.	.	.	.	.	.	.	.	1	.
Taxa true	8	8	7	8	7	8	8	6	8	8	7	8	5
Taxa temporary	5	4	5	4	5	5	5	3	5	6	3	5	6
Taxa total	13	12	12	12	12	13	13	9	13	14	10	13	11

Appendix 1-2. Densities of meiobenthic taxa (true and temporary) on all MILZON-BENTHOS II 1991 locations. Densities of the EXP*BMN station 4-5 (TS 100) are given in Huys & De Smet (1992).

Station	4-1	4-2	4-3	4-4	5-1	5-2	5-3	5-4	5-5	6-1	6-2	6-3	6-4	6-5
True														
Nematoda	1695	350	947	1423	1497	1460	834	3164	3554	2404	2477	2503	2107	1640
Copepoda	29	46	36	35	91	371	23	126	70	61	31	63	51	58
Gastrotricha	.	.	.	2	.	.	.	.	.	2	.	.	3	.
Turbellaria	10	11	12	14	1	2	3	1	1	3	5	1	.	1
Archiannelida	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oligochaeta	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polychaeta	.	6	3	6	4	4	.	3	1	3	3	3	.	.
Hydrozoa	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tardigrada	.	.	.	8	.	.	.	.	.	2	5	5	18	.
Ostracoda	9	1	2	3	11	16	1	12	7	2	.	1	.	1
Halacarida	.	.	.	.	.	2	.	1	1	.	.	.	.	.
Kinorhyncha	1	1	4	.	3	12	.	.	17	.	.	1	11	2
Priapulida	.	2	1	.	.	.	.	.	.	.	.	.	.	.
Temporary														
Nauplii	41	11	7	64	55	368	15	107	176	42	26	105	70	61
Bivalvia	8	6	3	4	5	4	.	3	5	1	3	5	6	5
Foraminifera	21	5	17	17	134	156	6	34	92	36	17	47	85	5
Isopoda	.	.	.	.	.	.	.	.	.	1	1	.	.	.
Cumacea	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Nemertina	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tanaidacea	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Amphipoda	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Echinoidea	.	.	.	.	3	.	.	.	.	1	2	3	1	.
Ophiuroidea	1	.	1	.	2	.	.	.	.	1	.	1	.	.
Gastropoda	.	.	.	.	.	.	.	2	41	.	.	.	.	.
Cnidaria other	.	.	.	.	.	.	1	8	.	.	.	3	.	.
Bryozoa	3	.	.	.	.	.	.	2	1	2	.	.	5	1
Cladocera	.	.	.	.	.	2	.	.	.	.	.	.	.	.
Taxa true	5	7	7	7	6	7	4	6	7	7	5	7	5	5
Taxa temporary	5	3	4	3	5	4	3	8	5	7	5	6	5	4
Taxa total	10	10	11	10	11	11	7	14	12	14	10	13	10	9

Appendix 1-3. Densities of meiobenthic taxa (true and temporary) on all MILZON-BENTHOS II 1991 locations. Densities of the EXP*BMN station 7-5 (META II) are given in Huys & De Smet (1992).

Station	7-1	7-2	7-3	7-4	8-1	8-2	8-3	8-4	8-5	9-1	9-2	9-3	9-4	9-5
<u>True</u>														
Nematoda	2470	3479	8180	1250	2290	3700	3300	1137	2907	2204	4935	2335	6406	1453
Copepoda	28	17	87	37	18	25	85	62	33	26	138	58	63	30
Gastrotricha	2	1	2	1	.	.	.	.	1	9	.	.	.	1
Turbellaria	3	10	.	4	12	3	6	5	2	5	1	7	5	8
Archiannelida	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oligochaeta	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polychaeta	1	.	2	1	2	7	2	.	1	1	1	.	1	4
Hydrozoa	.	.	2	.	.	.	.	.	.	.	.	.	.	.
Tardigrada	3	12	.	.	.	.	.	.	.	1	.	.	.	.
Ostracoda	10	1	4	1	1	1	.	1	2	.	.	.	.	.
Halacarida	.	1	7	.	.	1	3	.	1	.	3	.	1	.
Kinorhyncha	1	4	57	.	3	1	23	6	2	4	25	1	16	4
Priapulida	.	.	1	.	.	.	.	.	.	.	2	1	2	.
<u>Temporary</u>														
Nauplii	62	31	231	73	39	19	101	11	36	39	205	44	47	39
Bivalvia	1	3	2	4	.	1	3	.	4	9	7	.	1	1
Foraminifera	26	87	15	7	1	9	80	7	14	15	86	.	11	14
Isopoda	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cumacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nemertina	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tanaidacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Amphipoda	.	.	.	.	.	1	.	.	.	.	.	.	.	.
Echinoidea	.	.	.	.	.	.	1	.	.	.	.	5	.	.
Ophiuroidea	.	1	.	.	.	.	.	.	.	.	.	.	.	.
Gastropoda	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cnidaria other	.	1	18	.	.	.	.	.	1	1	7	.	2	.
Bryozoa	1	1	9	2	.	.	7	.	1	2	10	6	5	8
Cladocera	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Taxa true	8	8	9	6	6	7	6	5	8	7	7	5	7	6
Taxa temporary	4	6	5	4	2	4	5	2	5	5	5	3	5	4
Taxa total	12	14	14	10	8	11	11	7	13	12	12	8	12	10

Appendix 1-4. Densities of meiobenthic taxa (true and temporary) on all MILZON-BENTHOS II 1991 locations. Densities of the EXP*BMN station 10-5 (R 70) are given in Huys & De Smet (1992).

Station	10-1	10-2	10-3	10-4	11-1	11-2	11-3	11-4	12-1	12-2	12-3	12-4
<u>True</u>												
Nematoda	6550	1114	988	2301	5509	4341	8757	1864	1924	1642	903	9540
Copepoda	162	46	90	66	51	29	13	4	83	71	22	25
Gastrotricha	.	3	11	1	1	.	1	6	.	.	3	.
Turbellaria	3	5	9	12	1	4	1	10	2	7	19	3
Archiannelida	.	.	4	.	.	.	.	.	.	.	.	.
Oligochaeta	.	.	3	.	.	.	.	.	.	.	.	.
Polychaeta	.	1	6	1	2	1	.	2	2	4	3	1
Hydrozoa	.	.	.	.	.	1	.	3	.	.	.	.
Tardigrada	.	.	26	5	.	.	.	.	.	.	3	.
Ostracoda	.	.	12	.	1	2	.	1	1	1	.	1
Halacarida	.	.	11	.	.	.	1	.	.	.	.	.
Kinorhyncha	6	1	1	4	31	3	27	.	16	21	.	22
Priapulida	.	.	.	.	1	.	.	.	.	.	.	.
<u>Temporary</u>												
Nauplii	270	7	52	33	128	152	83	21	82	20	31	65
Bivalvia	3	1	3	3	5	7	8	2	1	1	2	10
Foraminifera	73	3	11	5	26	21	7	40	5	9	1	15
Isopoda	.	.	.	.	.	.	.	.	.	.	.	.
Cumacea	.	.	.	1	.	.	.	.	.	.	.	.
Nemertina	.	.	.	.	.	.	.	.	.	.	.	.
Tanaidacea	.	.	.	.	.	.	.	.	1	.	.	.
Amphipoda	.	.	.	.	.	.	.	.	.	.	.	.
Echinoidea	99	2	24	8	1	.	.	.	.	.	1	.
Ophiuroidea	5	.	3	.	.	.	.	.	.	.	.	.
Gastropoda	.	.	1	.	78	.	.	.	.	.	.	.
Cnidaria other	.	.	.	.	.	6	2	.	1	.	.	.
Bryozoa	1	.	.	2	.	19	4	1	1	7	2	1
Cladocera	.	.	.	.	.	.	.	.	.	.	.	.
Taxa true	4	6	11	7	8	7	6	7	6	6	6	6
Taxa temporary	6	4	6	6	5	5	5	4	6	4	5	4
Taxa total	10	10	17	13	13	12	11	11	12	10	11	10

Appendix 1-5. Densities of meiobenthic taxa (true and temporary) on all MILZON-BENTHOS II 1991 locations. Densities of the EXP*BMN station 15-4 (TS 30) are given in Huys & De Smet (1992).

Station	13-1	13-2	13-3	13-4	13-5	14-1	14-2	14-3	14-4	15-1	15-2	15-3
<u>True</u>												
Nematoda	2217	3869	1225	3125	3149	3454	2676	1256	2187	1879	1522	1223
Copepoda	43	44	98	13	48	8	252	271	150	25	157	287
Gastrotricha	1	7	11	80	4	30	96	139	396	79	101	81
Turbellaria	1	9	23	10	9	22	22	18	40	5	27	51
Archiannelida	.	.	.	.	.	.	4	.	13	.	.	3
Oligochaeta	.	.	.	.	.	.	25	1	3	.	.	.
Polychaeta	.	.	7	.	3	2	6	5	25	6	2	3
Hydrozoa	.	.	1	.	.	.	4	22	13	.	3	11
Tardigrada	.	.	4	6	9	64	93	6	17	55	32	76
Ostracoda	.	2	.	.	.	2	13	.	47	3	.	25
Halacarida	.	1	.	2	.	.	1	3	5	.	.	2
Kinorhyncha	6	4	.	.	.	.	.	.	.	.	.	.
Priapulida	1	.	.	.	.	.	.	.	.	.	.	.
<u>Temporary</u>												
Nauplii	367	78	71	86	80	43	68	26	44	30	68	202
Bivalvia	7	.	.	1	5	1	24	.	4	1	9	14
Foraminifera	8	35	.	1	12	3	20	1	14	2	19	41
Isopoda	.	.	.	.	.	.	.	.	.	.	.	.
Cumacea	1	.	.	.	.	.	.	.	.	.	.	.
Nemertina	.	.	.	.	.	.	1	.	.	.	.	.
Tanaidacea	.	.	.	.	.	.	1	.	.	1	.	.
Amphipoda	.	.	1	.	.	.	1	1	1	3	.	.
Echinoidea	.	2	.	.	.	1	.	.	.	.	.	.
Ophiuroidea	.	.	.	.	.	.	.	.	.	.	.	.
Gastropoda	.	.	.	.	.	.	.	.	1	.	.	.
Cnidaria other	.	.	.	.	.	.	.	.	.	1	.	.
Bryozoa	.	4	1	1	.	1	.	1	.	.	.	.
Cladocera	.	.	.	1	.	.	.	.	.	.	.	.
Taxa true	6	7	7	6	6	7	11	9	11	7	7	10
Taxa temporary	4	4	3	5	3	5	6	4	5	6	3	3
Taxa total	10	11	10	11	9	12	17	13	16	13	10	13

Appendix 1-6. Densities of meiobenthic taxa (true and temporary) on all MILZON-BENTHOS II 1991 locations. Densities of the EXP*BMN station 18-5 (R 50) are given in Huys & De Smet (1992).

Station	16-1	16-2	16-3	16-4	17-1	17-2	17-3	17-4	17-5	18-1	18-2	18-3	18-4
True													
Nematoda	2985	2093	3370	1888	2083	945	1242	1961	633	628	1796	992	966
Copepoda	24	24	38	19	8	46	4	11	8	22	11	318	73
Gastrotricha	1	.	3	.	4	22	3	3	.	3	7	32	131
Turbellaria	28	4	18	6	16	29	32	15	8	9	6	6	5
Archiannelida	.	.	.	.	.	.	.	.	.	.	.	6	8
Oligochaeta	.	.	.	.	.	.	.	.	.	.	.	10	.
Polychaeta	2	.	10	.	.	1	16	2	.	1	3	5	15
Hydrozoa	1	.	.	.	1	2	.	.	.	.	.	1	.
Tardigrada	.	.	3	1	3	4	.	1	.	3	.	40	.
Ostracoda	.	.	.	.	.	.	.	.	.	.	.	6	1
Halacarida	4	.	.	.	.	.	.	.	.	.	.	2	.
Kinorhyncha	.	.	1	.	.	.	.	.	2	.	.	.	.
Priapulida	.	.	.	.	.	.	.	.	.	.	.	.	.
Temporary													
Nauplii	13	24	28	11	23	10	44	18	5	8	39	75	42
Bivalvia	.	4	5	3	5	.	2	2	1	1	.	6	.
Foraminifera	.	.	.	2	49	1	1	1	.	.	.	14	11
Isopoda	.	.	.	.	.	.	.	.	.	.	.	.	.
Cumacea	.	.	1	.	.	.	.	.	.	.	.	1	.
Nemertina	.	.	.	.	.	.	.	.	.	.	.	.	.
Tanaidacea	.	.	.	.	.	.	.	.	.	.	.	.	.
Amphipoda	.	.	.	.	.	.	.	.	.	.	.	1	.
Echinoidea	.	2	.	.	.	1	20	10	.	1	2	.	8
Ophiuroidea	.	.	.	.	.	.	.	.	.	.	.	.	1
Gastropoda	.	.	.	1	.	.	3315	8	.	.	.	1	.
Cnidaria other	1	12	.	.	.	.	2	1	.	.	.	.	.
Bryozoa	2	.	2	2	.	2	.	1	.	.	3	1	.
Cladocera	.	.	.	.	.	.	.	.	.	.	.	.	.
Taxa true	7	3	7	4	6	7	5	6	4	6	5	11	7
Taxa temporary	3	4	4	5	3	4	6	7	2	4	3	7	4
Taxa total	10	7	11	9	9	11	11	13	6	10	8	18	11

Appendix 2-1.

MILZON-BENTHOS II 1991 (compartment : 1)

	Density (ind./m^2):					Biomass (g AFDW/m^2) :				
Station	11	12	13	14	15	11	12	13	14	15
Number	1	2	3	4	5	1	2	3	4	5
Compartment	1	1	1	1	1	1	1	1	1	1
Date	300591	300591	200591	290591	250491	300591	300591	290591	290591	250491
Species	31	32	27	24	31	31	32	27	24	31
Total/m^2	3467.31	3891.58	3086.93	1755.60	6437.20	11.98	21.30	12.92	9.89	1.84
Cluster	2	2	2	2	2	2	2	2	2	2
<u>Polychaeta :</u>										
ANAIROSE	14.63	.	.	.	.	.0088	.	.	.	.
CHAEVARI	.	29.26	14.63	.	.	.	7.8271	1.7351	.	.
CHAESETO	43.89	29.26	.	.	160.93	.0351	.0366	.	.	.1609
DIPLGLAU	43.89	43.89	.	14.63	73.15	.1039	.0644	.	.0146	.0293
ETEOFLAV	.	.	.	.	14.63	.	.	.	.	.0146
GATTCIRR	.	58.52	.	.	14.63	.	.4213	.	.	.0073
GLYCALBA	.	.	.	29.26	.	.	.	.	.1960	.
GLYCROUX	.	.	.	.	14.63	.	.	.	.	.3292
GONIMACU	14.63	.	14.63	.	29.26	.0176	.	.0219	.	.0263
HARMANTI	.	.	.	.	14.63	.	.	.	.	.0033
LYSILOVE	.	.	.	.	14.63	.	.	.	.	.1653
MAGEALLE	.	29.26	.	.	.	.	.0644	.	.	.
MAGEPAPI	29.26	73.15	29.26	117.04	102.41	.0293	.0219	.0146	.0424	.0017
NEPHHOMB	29.26	29.26	29.26	14.63	58.52	1.3460	.2853	1.2128	.8032	.1873
NERELONG	.	.	14.63	.	14.63	.	.	.0146	.	.0146
NOTOLATE	.	.	43.89	.	29.26	.	.	1.0446	.	.3160
OPHIFLEX	14.63	14.63	29.26	.	43.89	.0146	.0922	.0439	.	.0070
OWENFUSI	14.63	58.52	14.63	14.63	29.26	.0117	.0146	.0073	.0059	.0117
PARAGRAC	.	.	.	.	29.26	.	.	.	.	.0004
PECTAURI	58.52	14.63	277.97	.	14.63	.1931	.0219	.5018	.	.0008
PHOLMINU	146.30	117.04	29.26	117.04	14.63	.0585	.0468	.0132	.0336	.0044
POLYKINB	.	.	.	.	29.26	.	.	.	.	.0348
PRIOCIRR	.	.	.	.	43.89	.	.	.	.	.0006
RHODGRAC	.	.	.	.	43.89	.	.	.	.	.4257
SCOLARMI	87.78	146.30	73.15	43.89	29.26	.0644	.1156	.0571	.0454	.0013
SIGAMATH	.	43.89	.	.	14.63	.	.1434	.	.	.0008
SPIOBOMB	29.26	248.71	29.26	14.63	29.26	.0088	.1317	.0088	.0044	.0004
SPIOFILI	.	14.63	131.67	29.26	.	.	.0059	.0512	.0219	.
STHELIMI	.	29.26	.	14.63	14.63	.	.1624	.	.0146	.0936
SYNEKLAT	14.63	14.63	.	.	58.52	.0044	.0044	.	.	.0146
<u>Mollusca :</u>										
CARDEDUL	14.63	.	14.63	.	.	.0029	.	.0029	.	.
CHAETODE	.	.	.	.	29.26	.	.	.	.	.0585
CULTPELL	.	.	29.26	14.63	43.89	.	.	.0059	.0029	.0088
CYLICYLI	.	.	.	.	43.89	.	.	.	.	.0009
MUSCDISC	.	.	.	.	43.89	.	.	.	.	.0132
MYSEBIDE	1024.10	1053.36	863.17	395.01	14.63	.1697	.2004	.1302	.0732	.0059
MYSIUNDA	.	.	.	29.26	43.89	.	.	.	.0088	.0732
NUCUTENU	14.63	29.26	14.63	58.52	73.15	.0044	.0117	.0029	.0146	.0011
NUCUTURG	.	.	.	.	29.26	.	.	.	.	.0018
THYAFLEX	14.63	.	.	14.63	43.89	.0161	.	.	.0424	.0010
VENUSTRI	.	14.63	.	.	.	.	4.7430	.	.	.
<u>Crustacea :</u>										
AMPETENU	14.63	29.26	14.63	.	43.89	.0044	.0088	.0044	.	.0234
BATHTENU	58.52	14.63	.	43.89	.	.0234	.0059	.	.0176	.
CALLSUBT	29.26	43.89	58.52	43.89	14.63	.0556	.2048	1.0987	3.1967	.1346
CAPRSPEC	.	.	.	.	14.63	.	.	.	.	.0073
CIROBORE	.	.	219.45	.	.	.	.	.2268	.	.
DIASBRAD	14.63	14.63	.	.	43.89	.0029	.0102	.	.	.0006
DYOPMONA	.	.	.	.	14.63	.	.	.	.	.0044
EBALCRAN	.	.	.	.	14.63	.	.	.	.	.0219
EUDOEMAR	.	.	.	.	73.15	.	.	.	.	.0732
EUDODEFO	29.26	58.52	.	.	14.63	.0059	.0117	.	.	.0002
EUDOTRUN	14.63	29.26	14.63	14.63	.	.0029	.0059	.0044	.0044	.
HARPANTE	102.41	117.04	43.89	43.89	146.30	.0307	.0351	.0132	.0132	.0439
PARAODON	.	.	.	.	14.63	.	.	.	.	.0044
PERILONG	29.26	.	14.63	14.63	14.63	.0088	.	.0044	.0044	.0044
PSEUSIMI	.	.	.	14.63	.	.	.	.	.0044	.
UROTELEG	.	14.63	.	.	.	.	.0044	.	.	.
<u>Echinodermata :</u>										
AMPHFILI	1228.92	1243.55	994.84	570.57	277.97	9.2169	6.4591	6.5557	5.2653	.2282
ECHICORD	102.41	.	.	.	.	.3058	.	.	.	.
LEPTINHA	.	.	.	.	219.45	.	.	.	.	.1434
OPHIALBI	.	.	.	.	14.63	.	.	.	.	.0146
OPHISPEC	14.63	.	.	.	.	.0029	.	.	.	.
<u>Rest :</u>										
ANTHOZOA	73.15	117.04	14.63	14.63	43.89	.1127	.0732	.0073	.0117	.0182
HYDROZOA	.	.	.	.	14.63	.	.	.	.	.0029
NEMERTIN	73.15	102.41	29.26	.	73.15	.0863	.0585	.1287	.	.0366
PHORONID	73.15	14.63	29.26	73.15	58.52	.0293	.0073	.0073	.0454	.0322
PLATHYHE	.	.	.	.	14.63	.	.	.	.	.0146

Appendix 2-2.

MILZON-BENTHOS II 1991 (compartment : 2)

	Density (ind./m^2) :					Biomass (g AFDW/m^2) :				
Station	21	22	23	24	25	21	22	23	24	25
Number	6	7	8	9	10	6	7	8	9	10
Compartment	2	2	2	2	2	2	2	2	2	2
Date	300591	300591	300591	300591	300591	300591	300591	300591	300591	300591
Species	35	33	23	31	25	35	33	23	31	25
Total/m^2	1770.23	2340.80	980.21	2472.47	2267.65	2.59	31.14	13.96	9.72	26.05
Cluster	2	2	1	2	1	2	2	1	2	1
<u>Polychaeta :</u>										
APHRACUL	.	.	.	29.26	.	.	.	.	.6335	.
CHAEVARI	.	14.63	.	29.26	102.41	.	.1375	.	2.1652	19.3979
CHAESETO	160.93	29.26	43.89	43.89	87.78	.1609	.0205	.0176	.0219	.0439
DIPLGLAU	73.15	14.63	14.63	131.67	43.89	.0293	.0059	.0219	.1770	.0219
ETEOFLAV	14.63	.	.	.	.	.0146	.	.	.	.
GATTCIRR	14.63	14.63	.	58.52	58.52	.0073	.0102	.	.2238	.5647
GLYCROUX	14.63	.	29.26	14.63	29.26	.3292	.	.6584	.4418	.4140
GONIMACU	29.26	29.26	29.26	14.63	.	.0263	.0234	.0688	.0073	.
HARMLUNU	.	.	.	14.63	.	.	.	.	.0293	.
LANICONC	.	.	.	14.63	.	.	.	.	.5194	.
LUMBLATR	.	.	14.63	.	14.63	.	.	.0366	.	.0219
MAGEALLE	.	.	14.63	.	.	.	.	.0439	.	.
MAGEPAPI	.	.	.	.	14.63	.	.	.	.	.0059
NEPHCIRR	.	29.26	.	.	.	.	.1653	.	.	.
NEPHHOMB	58.52	43.89	.	29.26	.	.1873	.2516	.	.1404	.
NEPHSPEC	.	.	.	.	14.63	.	.	.	.	.0102
NERELONG	14.63	.	.	.	.	.0146	.	.	.	.
NOTOLATE	29.26	29.26	87.78	29.26	14.63	.3160	.3365	1.1250	.4360	.3599
OPHELIMA	.	.	14.63	.	.	.	.	.1083	.	.
OPHIFLEX	.	29.26	29.26	.	14.63	.	.0878	.1083	.	.0483
OWENFUSI	29.26	117.04	.	29.26	14.63	.0117	.0732	.	.0146	.0073
PARAGRAC	.	102.41	14.63	29.26	14.63	.	.0205	.0044	.0088	.0044
PECTAURI	.	43.89	.	117.04	14.63	.	.1068	.	.0512	.0146
PHOLMINU	14.63	58.52	.	29.26	29.26	.0044	.0234	.	.0117	.0117
POLYSPEC	.	.	43.89	.	.	.	.	.0176	.	.
RHODGRAC	43.89	.	.	.	.	.4257	.	.	.	.
SPIOBOMB	.	58.52	.	.	.	.	.0176	.	.	.
SPIOFILI	.	.	43.89	43.89	29.26	.	.	.0132	.0176	.0146
SPIOKROY	.	.	.	14.63	14.63	.	.	.	.0293	.0219
STHELIMI	14.63	.	.	.	14.63	.0936	.	.	.	.0556
SYNEKLAT	58.52	43.89	14.63	29.26	14.63	.0146	.0132	.0029	.0088	.0059
<u>Mollusca :</u>										
ABRANITI	.	.	14.63	.	.	.	.	.0293	.	.
CHAETODE	29.26	73.15	14.63	14.63	.	.0585	.1463	.0293	.0293	.
CORBGIBB	.	29.26	.	.	.	.	.0088	.	.	.
CULTPELL	43.89	14.63	.	14.63	.	.0088	.0029	.	.0029	.
CYLICYLI	.	29.26	.	.	.	.	.0219	.	.	.
MUSCDISC	43.89	.	.	.	.	.0132	.	.	.	.
MUSCNIGE	.	14.63	.	.	.	.	5.0722	.	.	.
MYA TRUN	.	14.63	.	.	.	.	21.2925	.	.	.
MYSEBIDE	14.63	131.67	14.63	277.97	190.19	.0059	.0395	.0029	.0366	.0219
MYSIUNDA	43.89	.	.	.	.	.0732	.	.	.	.
NUCUSPEC	.	14.63	.	.	.	.	.0029	.	.	.
THRACONV	.	.	.	14.63	.	.	.	.	.0044	.
<u>Crustacea :</u>										
ACIDSARS	.	29.26	.	.	.	.	.0088	.	.	.
AMPETENU	43.89	14.63	.	29.26	14.63	.0234	.0044	.	.0088	.0044
CALLSUBT	14.63	.	102.41	14.63	73.15	.1346	.	3.6707	.0059	1.6795
CAPRSPEC	14.63	.	.	.	.	.0073	.	.	.	.
DYOPMONA	14.63	.	.	.	.	.0044	.	.	.	.
EBALCRAN	14.63	.	.	.	.	.0219	.	.	.	.
EUDOEMAR	73.15	.	.	14.63	.	.0732	.	.	.0044	.
HARPANTE	146.30	29.26	43.89	58.52	43.89	.0439	.0088	.0132	.0176	.0132
LEUCINCI	.	.	14.63	.	.	.	.	.0059	.	.
OSTRACOD	.	.	.	14.63	.	.	.	.	.0073	.
PARAODON	14.63	.	.	.	.	.0044	.	.	.	.
PERILONG	14.63	.	.	14.63	.	.0044	.	.	.0044	.
UPOGDELT	.	.	14.63	.	.	.	.	.1799	.	.
<u>Echinodermata :</u>										
AMPHFILI	277.97	950.95	336.49	1185.03	1141.14	.2282	2.0467	.6949	4.2193	3.0591
BRISLYRI	.	.	.	29.26	.	.	.	.	.3116	.
ECHICORD	.	.	14.63	.	.	.	.	7.0912	.	.
LEPTINHA	219.45	117.04	.	87.78	248.71	.1434	.0644	.	.1258	.2326
OPHIALBI	14.63	.	.	.	.	.0146	.	.	.	.
<u>Rest :</u>										
ANTHOZOA	.	43.89	.	.	.	.	1.0475	.	.	.
HYDROZOA	14.63	14.63	.	.	.	.0029	.0117	.	.	.
NEMERTIN	73.15	14.63	.	.	14.63	.0366	.0146	.	.	.0117
PHORONID	58.52	131.67	.	.	.	.0322	.0132	.	.	.
PLATHYHE	14.63	.	14.63	.	.	.0146	.	.0146	.	.
SIPUNCUL	.	14.63	.	.	.	.	.0366	.	.	.

Appendix 2-3.

MILZON-BENTHOS II 1991 (compartment : 3)

Density (ind./m²) :						Biomass (g AFDW/m²) :				
Station	31	32	33	34	35	31	32	33	34	35
Number	11	12	13	14	15	11	12	13	14	15
Compartment	3	3	3	3	3	3	3	3	3	3
Date	030791	030791	030791	030791	240491	030791	030791	030791	030791	240491
Species	30	25	30	29	24	30	25	30	29	24
Total/m²	3628.24	3101.56	2355.43	3803.80	2911.37	11.38	8.90	7.44	12.25	1.76
Cluster	2	2	2	2	2	2	2	2	2	2
Polychaeta :										
CHAESETO	.	.	29.26	14.63	.	.	.	.0219	.0219	.
GATTCIRR	14.63	.	.	.	.	.0073	.	.	.	.
GONIMACU	.	58.52	.	29.26	14.63	.	.1873		.0146	.0003
GYPTCAPE	.	14.63	.	.	.	.	.0073	.	.	.
HARMSPEC	.	29.26	29.26	.	.	.	.0059	.0146	.	.
LANICONC	14.63	.	14.63	29.26	.	.0015	.	.1068	.0029	.
MAGEALLE	14.63	.	.	.	.	.2692	.	.	.	.
MAGEPAPI	175.56	131.67	73.15	.	292.60	.1053	.0585	.0732	.	.0034
NEPHHOMB	.	29.26	29.26	14.63	29.26	.	.0293	.3906	.1053	.0004
NEPHSPEC	14.63	.	.	.	.	.0073	.	.	.	.
OPHIFLEX	14.63	14.63	14.63	14.63	.	.0366	.0819	.0439	.1009	.
OWENFUSI	.	29.26	14.63	.	14.63	.	.0059	.0176	.	.0002
PECTAURI	.	29.26	14.63	14.63	14.63	.	.0790	.0059	.0059	.0003
PECTKORE	14.63	14.63	.	14.63	.	.0059	.0059	.	.0029	.
PHOLMINU	234.08	87.78	29.26	58.52	.	.0936	.0351	.0117	.0234	.
POECSERP	14.63	.	.	29.26	14.63	.0117	.	.	.0234	.0002
POLYSPEC	160.93	.	.	.	.	.0483	.	.	.	.
SCOLARMI	87.78	43.89	58.52	14.63	14.63	.2312	.1434	.0746	.0059	.0002
SIGAMATH	43.89	14.63	.	.	.	.0219	.5457	.	.	.
SPIOBOMB	131.67	43.89	29.26	58.52	29.26	.0395	.0439	.0146	.0176	.0004
SPIOFILI	.	.	.	73.15	.	.	.	.	.0219	.
STHELIMI	.	.	14.63	.	.	.	.	.0614	.	.
SYNEKLAT	.	.	29.26	14.63	58.52	.	.	.0088	.0029	.0008
Mollusca :										
ABRAALBA	14.63	.	29.26	.	.	.0029	.	.0059	.	.
CULTPELL	14.63	14.63	14.63	.	.	.0029	.0044	.0044	.	.
COCHPRAE	14.63	.	.	.	.	.0029	.	.	.	.
CORBGIBB	.	248.71	43.89	87.78	204.82	.	.0746	.0132	.0176	.0076
CYLICYLI	.	.	.	43.89	14.63	.	.	.	.0176	.0000
DOSILUPI	.	.	.	.	29.26	.	.	.	.	.0046
LEPTSQUA	29.26	.	.	.	.	.0059	.	.	.	.
MACTCORA	14.63	.	.	.	.	.0059	.	.	.	.
MONTFERR	.	.	14.63	14.63	.	.	.	.0073	.0059	.
MYA TRUN	.	.	14.63	.	.	.	.	.0029	.	.
MYSEBIDE	1316.70	950.95	965.58	1345.96	365.75	.1653	.2853	.2195	.1741	.0050
NUCUTURG	.	14.63	.	.	.	.	.0044	.	.	.
NUCUSPEC	.	.	14.63	.	.	.	.	.0029	.	.
SPISSPEC	.	14.63	29.26	.	14.63	.	.0029	.0059	.	.0002
TELLFABU	.	.	.	.	14.63	.	.	.	.	.0002
TELLSPEC	.	.	14.63	.	.	.	.	.0029	.	.
VENUSTRI	.	.	.	.	43.89	.	.	.	.	.0009
Crustacea :										
BATHELEG	14.63	.	14.63	14.63	.	.0044	.	.0044	.0044	.
BATHTENU	29.26	14.63	43.89	.	29.26	.0132	.0044	.0132	.	.0004
CALLSUBT	29.26	.	29.26	102.41	175.56	2.6217	.	2.2881	2.6378	.4196
CORYCASS	.	.	.	14.63	.	.	.	.	.0073	.
DIASRATH	.	.	.	14.63	.	.	.	.	.0219	.
EUDODEFO	.	.	14.63	.	29.26	.	.	.0044	.	.0004
HARPANTE	190.19	73.15	117.04	73.15	29.26	.0571	.0219	.0351	.0219	.0004
ISOPODA	.	.	.	14.63	.	.	.	.	.0073	.
PERILONG	.	.	.	14.63	.	.	.	.	.0044	.
UPOGDELT	14.63	.	.	.	.	.2326	.	.	.	.
UROTELEG	.	14.63	.	29.26	.	.	.0044	.	.0088	.
Echinodermata :										
AMPHFILI	863.17	1038.73	526.68	1565.41	1214.29	7.3033	7.2462	3.9574	8.9184	.6972
ECHICORD	.	.	.	.	29.26	.	.	.	.	.6138
Rest :										
ANTHOZOA	29.26	.	29.26	43.89	.	.0512	.	.0146	.0219	.
HYDROZOA	.	29.26	.	.	.	.	.0059	.	.	.
NEMERTIN	43.89	14.63	.	.	43.89	.0146	.0073	.	.	.0011
PHORONID	43.89	131.67	58.52	29.26	190.19	.0073	.0132	.0117	.0117	.0052
PLATHYHE	14.63	.	.	14.63	.	.0073	.	.	.0146	.

Appendix 2-4.

MILZON-BENTHOS II 1991 (compartment : 4)

Density (ind./m²) :						Biomass (g AFDW/m²) :				
Station	41	42	43	44	45	41	42	43	44	45
Number	16	17	18	19	20	16	17	18	19	20
Compartment	4	4	4	4	4	4	4	4	4	4
Date	290591	290591	290591	290591	290591	290591	290591	290591	290591	290591
Species	26	23	24	22	34	26	23	24	22	34
Total/m²	1389.85	1623.93	1945.79	1155.77	1784.86	32.25	9.74	39.09	7.93	2.08
Cluster	1	1	2	2	1	1	1	2	2	1
Polychaeta :										
CHAESETO	190.19	29.26	14.63	14.63	29.26	.1873	.0117	.0073	.0044	.0004
CHAEVARI	43.89	14.63	14.63	.	117.04	3.9779	.4872	1.2933	.	1.5889
CIRRATUL	.	.	.	.	14.63	.	.	.	.	.0002
DIPLGLAU	.	14.63	14.63	14.63	29.26	.	.0102	.0073	.0059	.0008
GATTCIRR	58.52	.	14.63	14.63	58.52	.8207	.	.0059	.2897	.0248
GONIMACU	.	14.63	.	.	.	.	.0146	.	.	.
GLYCROUX	14.63	43.89	29.26	.	29.26	1.7644	5.0664	2.7782	.	.0521
GYPTCAPE	14.63	.	.	29.26	.	.0146	.	.	.0088	.
HARMLONG	.	14.63	.	.	14.63	.	.0732	.	.	.0005
HARMLUNU	58.52	.	.	.	.	.1887	.	.	.	.
LAONCIRR	.	.	.	.	14.63	.	.	.	.	.0046
LUMBLATR	.	14.63	.	14.63	14.63	.	.0761	.	.0366	.0013
LUMBPSEU	.	.	.	.	29.26	.	.	.	.	.0026
MAGEPAPI	14.63	.	.	14.63	14.63	.0059	.	.	.0044	.0002
NEPHHOMB	29.26	14.63	14.63	14.63	14.63	.3833	.1609	.0995	.2341	.0013
NEPHSPEC	.	29.26	29.26	43.89	.	.	.0146	.0102	.0146	.
NERELONG	.	.	.	.	14.63	.	.	.	.	.0158
NEREPELA	.	14.63	.	.	.	.	.5018	.	.	.
NOTOLATE	29.26	14.63	.	.	14.63	.3262	.2853	.	.	.0026
OPHEACUM	.	.	14.63	.	.	.	.	.1287	.	.
OPHIFLEX	29.26	.	14.63	.	.	.0936	.	.0512	.	.
OWENFUSI	29.26	.	.	.	.	.0146	.	.	.	.
PARAGRAC	29.26	.	.	.	14.63	.0029	.	.	.	.0002
PECTAURI	29.26	.	117.04	.	14.63	.0146	.	.2824	.	.0091
PECTKORE	117.04	.	.	.	.	.0117	.	.	.	.
PHOLMINU	14.63	14.63	29.26	14.63	29.26	.0044	.0059	.0117	.0059	.0010
POLYCRAS	.	.	14.63	.	.	.	.	1.3167	.	.
PRIOCIRR	.	.	.	.	29.26	.	.	.	.	.0004
SPIOFILI	29.26	58.52	43.89	.	.	.0293	.0176	.0132	.	.
STHELIMI	.	.	.	14.63	14.63	.	.	.	.0219	.0034
SYNEKLAT	14.63	14.63	87.78	58.52	29.26	.0044	.0029	.0263	.0234	.0004
TERESTRO	.	.	.	.	14.63	.	.	.	.	.0013
Mollusca :										
CINGVITR	.	.	.	.	29.26	.	.	.	.	.0005
CORBGIBB	.	.	.	.	14.63	.	.	.	.	.0003
CULTPELL	.	.	.	14.63	.	.	.	.	.0044	.
CYLICYLI	.	.	.	.	29.26	.	.	.	.	.0013
MONTFERR	.	29.26	.	.	.	.	.0146	.	.	.
MYSEBIDE	131.67	468.16	292.60	263.34	131.67	.0263	.1404	.1097	.0673	.0018
NUCUTURG	.	.	.	14.63	29.26	.	.	.	.0073	.0108
THRACONV	.	.	14.63	.	.	.	.	5.6984	.	.
Crustacea :										
AMPETENU	.	.	.	.	14.63	.	.	.	.	.0002
BATHELEG	.	.	.	14.63	.	.	.	.	.0044	.
CALLSUBT	73.15	87.78	102.41	29.26	102.41	.3745	.3453	1.7483	.5925	.1758
EUDOTRUN	.	.	14.63	.	14.63	.	.	.0044	.	.0002
HARPANTE	43.89	29.26	14.63	117.04	14.63	.0132	.0088	.0044	.0351	.0002
IONETHOR	.	.	14.63	.	.	.	.	.1009	.	.
PONTALTA	.	.	.	14.63	.	.	.	.	.0044	.
PROCNOUV	.	.	14.63	.	.	.	.	.5808	.	.
SCHIKERV	.	14.63	.	.	.	.	.0146	.	.	.
UPOGDELT	14.63	.	.	.	.	3.1425	.	.	.	.
Echinodermata :										
AMPHFILI	234.08	599.83	980.21	351.12	790.02	1.0577	2.4330	3.5361	2.1331	.1274
BRISLYRI	.	.	29.26	.	.	.	.	21.2735	.	.
ECHICORD	58.52	.	.	43.89	.	18.6854	.	.	4.4212	.
LABIBUSK	.	.	.	.	14.63	.	.	.	.	.0005
Rest :										
ANTHOZOA	.	14.63	.	14.63	.	.	.0102	.	.0073	.
NEMERTIN	14.63	.	.	.	14.63	.0088	.	.	.	.0002
PHORONID	43.89	43.89	14.63	29.26	.	.0132	.0190	.0044	.0059	.
PLATHYHE	.	29.26	.	.	.	.	.0219	.	.	.
SIPUNCUL	29.26	.	.	.	29.26	1.0841	.	.	.	.0477

Appendix 2-5.

MILZON-BENTHOS II 1991 (compartment : 5)

	Density (ind./m²) :					Biomass (g AFDW/m²) :				
Station	51	52	53	54	55	51	52	53	54	55
Number	21	22	23	24	25	21	22	23	24	25
Compartment	5	5	5	5	5	5	5	5	5	5
Date	020791	030791	030791	030791	030791	020791	030791	030791	030791	030791
Species	26	20	22	22	21	26	20	22	22	21
Total/m²	614.46	672.98	2135.98	2033.57	1784.86	11.63	12.78	41.16	21.74	43.11
Cluster	1	1	1	1	1	1	1	1	1	1
Polychaeta :										
CHAESETO	43.89	.	.	102.41	.	.0219	.	.	.0410	.
CHAEVARI	29.26	58.52	204.82	14.63	453.53	2.6085	8.2586	26.5008	.5559	37.2846
GATTCIRR	43.89	73.15	248.71	14.63	380.38	.8442	1.4133	2.6334	.0073	2.1667
GLYCROUX	14.63	.	14.63	.	14.63	.4038	.	.2794	.	.2121
GONIMACU	14.63	14.63	29.26	.	.	.0102	.0293	.0293	.	.
GYPTCAPE	.	.	.	.	14.63	.	.	.	.	.0102
LANICONC	14.63	.	.	14.63	14.63	.0029	.	.	.0029	.0029
LUMBLATR	29.26	58.52	29.26	43.89	58.52	.1580	.0878	.2999	.0439	.0585
MAGEALLE	.	.	87.78	.	.	.	.	.0878	.	.
NEPHCIRR	.	.	.	.	14.63	.	.	.	.	.0102
NEPHHOMB	.	14.63	.	58.52	.	.	.7154	.	.3526	.
NEPHSPEC	14.63	14.63	29.26	.	.	.0102	.0073	.0117	.	.
NERELONG	29.26	14.63	29.26	14.63	43.89	.0600	.0146	.0146	.0102	.1960
NOTOLATE	.	.	424.27	.	204.82	.	.	2.3189	.	.7900
OPHEACUM	.	.	14.63	.	29.26	.	.	.0073	.	.0088
OPHIFLEX	14.63	14.63	.	14.63	.	.0439	.0146	.	.0219	.
OWENFUSI	.	.	.	14.63	.	.	.	.	.0146	.
PARAGRAC	14.63	.	.	.	.	.0029	.	.	.	.
PECTAURI	43.89	.	.	14.63	.	.0132	.	.	.0146	.
PECTKORE	.	14.63	.	.	58.52	.	.0029	.	.	.0059
PHOLMINU	14.63	.	29.26	14.63	.	.0059	.	.0117	.0059	.
POLYSPEC	.	.	146.30	.	.	.	.	.0439	.	.
SCALINFL	.	.	.	.	14.63	.	.	.	.	.0029
SPIOARMA	14.63	.	.	.	.	.0293	.	.	.	.
SPIOBOMB	14.63	.	.	.	.	.0044	.	.	.	.
SPIOFILI	.	29.26	43.89	14.63	.	.	.0088	.0146	.0044	.
SPIOKROY	14.63	.	.	.	.	.0117	.	.	.	.
STHELIMI	.	.	.	14.63	.	.	.	.	.0336	.
SYNEKLAT	.	14.63	14.63	14.63	29.26	.	.0029	.0044	.0044	.0073
Mollusca :										
CORBGIBB	.	29.26	.	.	14.63	.	.0059	.	.	.0029
CYLICYLI	14.63	.	.	.	.	.0073	.	.	.	.
ENSIARCU	14.63	.	.	.	.	.3072	.	.	.	.
MONTFERR	14.63	14.63	.	.	.	.0029	.0102	.	.	.
MYSEBIDE	.	14.63	.	29.26	.	.	.0073	.	.0059	.
Crustacea :										
AMPETENU	.	14.63	.	.	.	.	.0059	.	.	.
CALLSUBT	43.89	117.04	175.56	146.30	87.78	1.1382	1.9516	3.0782	4.5924	2.0658
CORYCASS	.	.	14.63	.	.	.	.	.0073	.	.
EUDOTRUN	.	14.63	14.63	.	.	.	.0029	.0029	.	.
HARPANTE	14.63	29.26	29.26	102.41	14.63	.0044	.0088	.0088	.0307	.0059
HIPPDENT	14.63	.	.	.	.	.0044	.	.	.	.
IONETHOR	.	14.63	.	.	.	.	.0102	.	.	.
PROCEDUL	14.63	.	.	.	.	.0293	.	.	.	.
UPOGDELT	.	.	43.89	14.63	.	.	.	3.6370	7.9704	.
Echinodermata :										
AMPHFILI	87.78	102.41	263.34	1287.44	117.04	.1551	.2238	.6174	3.0635	.1463
ECHICORD	14.63	.	.	29.26	.	5.7467	.	.	4.9128	.
Rest :										
ANTHOZOA	.	.	.	.	14.63	.	.	.	.	.0044
HYDROZOA	.	.	.	.	14.63	.	.	.	.	.0029
NEMERTIN	.	.	14.63	.	14.63	.	.	.0029	.	.0073
PHORONID	.	.	.	43.89	.	.	.	.	.0176	.
SIPUNCUL	14.63	.	234.08	14.63	175.56	.0073	.	1.5479	.0293	.1200

Appendix 2-6.

MILZON-BENTHOS II 1991 (compartment : 6)

	Density (ind./m²) :					Biomass (g AFDW/m²) :				
Station	61	62	63	64	65	61	62	63	64	65
Number	26	27	28	29	30	26	27	28	29	30
Compartment	6	6	6	6	6	6	6	6	6	6
Date	030791	030791	030791	030791	030791	030791	030791	030791	030791	030791
Species	25	17	26	19	21	25	17	26	19	21
Total/m²	1565.41	1316.70	2238.39	2413.95	907.06	5.13	14.55	9.12	7.26	22.28
Cluster	2	2	1	2	1	2	2	1	2	1
Polychaeta :										
CHAEVARI	.	.	.	.	29.26	.	.	.	.	5.9998
CHAESETO	.	.	.	.	29.26	.	.	.	.	.0102
DIPLGLAU	.	.	14.63	.	.	.	.	.0102	.	.
GATTCIRR	.	.	.	.	14.63	.	.	.	.	.1624
GLYCROUX	.	.	14.63	.	.	.	.	.1829	.	.
GONIMACU	58.52	.	.	14.63	.	.0585	.	.	.0059	.
GYPTCAPE	14.63	14.63	.	.	29.26	.0146	.0146	.	.	.0293
HARMSPEC	.	.	14.63	14.63	.	.	.	.0059	.0044	.
LANICONC	73.15	.	.	14.63	87.78	.0117	.	.	.0015	.0190
LUMBLATR	.	.	14.63	.	43.89	.	.	.0293	.	.0439
MAGEPAPI	131.67	102.41	.	43.89	.	.0658	.0307	.	.0132	.
NEPHCIRR	.	.	29.26	.	.	.	.	.0219	.	.
NEPHHOMB	.	.	14.63	.	43.89	.	.	.2882	.	.0439
NERELONG	.	.	14.63	.	.	.	.	.0088	.	.
NOTOLATE	.	14.63	58.52	.	.	.	.4857	1.5757	.	.
OPHEACUM	.	.	.	14.63	.	.	.	.	.0073	.
OPHIFLEX	14.63	14.63	.	14.63	.	.0439	.0600	.	.0146	.
PARAGRAC	.	.	.	.	14.63	.	.	.	.	.0073
PECTKORE	43.89	.	.	.	.	.0044	.	.	.	.
PHOLMINU	14.63	14.63	131.67	87.78	14.63	.0044	.0059	.0527	.0351	.0059
POLYSPEC	.	.	29.26	.	.	.	.	.0117	.	.
SCALINFL	.	.	.	58.52	.	.	.	.	.0234	.
SCOLARMI	14.63	43.89	73.15	.	.	.0293	.0293	.1331	.	.
SIGAMATH	.	29.26	.	.	.	.	.1917	.	.	.
SPIOBOMB	87.78	58.52	292.60	424.27	87.78	.0176	.0117	.0585	.0878	.0176
STHELIMI	.	.	.	.	14.63	.	.	.	.	.0293
SYNEKLAT	14.63	14.63	.	29.26	43.89	.0044	.0088	.	.0088	.0219
Mollusca :										
ABRAALBA	.	.	87.78	980.21	58.52	.	.	.0146	.2048	.0293
ABRASPEC	117.04	.	.	.	.	.0088	.	.	.	.
CORBGIBB	58.52	.	43.89	.	.	.0117	.	.0088	.	.
CULTPELL	.	.	14.63	.	.	.	.	.0059	.	.
CYLICYLI	.	.	.	14.63	.	.	.	.	.0073	.
GARIFERV	.	.	.	.	29.26	.	.	.	.	6.6347
MYSEBIDE	234.08	190.19	190.19	175.56	.	.0702	.0585	.0387	.0351	.
NATIALDE	.	.	.	.	14.63	.	.	.	.	.0117
NUCUTURG	43.89	.	.	.	.	.0176	.	.	.	.
THRAPHAS	14.63	.	.	.	.	.0044	.	.	.	.
VENUSTRI	.	.	.	14.63	.	.	.	.	.0059	.
Crustacea :										
BATHGUIL	14.63	.	.	.	.	.0044	.	.	.	.
BATHTENU	.	14.63	.	.	.	.	.0044	.	.	.
CALLSUBT	87.78	117.04	131.67	131.67	102.41	3.2025	4.1374	2.2062	5.9281	6.7122
CORYCASS	.	.	14.63	.	.	.	.	.0073	.	.
EUDOTRUN	29.26	14.63	.	29.26	.	.0088	.0044	.	.0059	.
GASTSPIN	.	.	14.63	.	.	.	.	.1639	.	.
HARPANTE	131.67	73.15	102.41	.	131.67	.0395	.0219	.0307	.	.0395
HIPPDENT	14.63	.	.	.	.	.0059	.	.	.	.
IONETHOR	.	.	14.63	.	.	.	.	.0059	.	.
PERILONG	29.26	.	14.63	.	.	.0088	.	.0044	.	.
PSEULONG	.	.	.	14.63	.	.	.	.	.0029	.
UPOGDELT	.	.	29.26	.	.	.	.	.3204	.	.
UROTELEG	58.52	.	.	.	.	.0176	.	.	.	.
Echinodermata :										
AMPHFILI	204.82	541.31	833.91	117.04	58.52	1.4528	3.2449	3.9238	.7827	.1463
ECHICORD	.	14.63	.	.	14.63	.	6.2382	.	.	2.1960
Rest :										
ANTHOZOA	14.63	.	.	.	.	.0059	.	.	.	.
NEMERTIN	.	.	29.26	.	.	.	.	.0059	.	.
PHORONID	43.89	43.89	.	219.45	14.63	.0146	.0059	.	.0878	.0073
SIPUNCUL	.	.	14.63	.	29.26	.	.	.0073	.	.1170

Appendix 2-7.

MILZON-BENTHOS II 1991 (compartment : 7)

	Density (ind./m²) :					Biomass (g AFDW/m²) :				
Station	71	72	73	74	75	71	72	73	74	75
Number	31	32	33	34	35	31	32	33	34	35
Compartment	7	7	7	7	7	7	7	7	7	7
Date	290591	290591	290591	290591	280591	290591	290591	290591	290591	280591
Species	22	21	27	26	28	22	21	27	26	28
Total/m²	702.24	3072.30	3203.97	5559.40	5515.51	13.67	30.25	25.35	47.01	3.15
Cluster	1	1	1	1	1	1	1	1	1	1
Polychaeta :										
AONIPAUC	.	.	.	14.63	.	.	.	.	.0044	.
CHAESETO	.	.	.	.	14.63	.	.	.	.	.0002
CHAEVARI	14.63	29.26	190.19	14.63	29.26	6.4372	7.4584	7.4554	3.9764	.1291
DIPLGLAU	.	14.63	29.26	14.63	14.63	.	.0088	.0117	.0059	.0002
GATTCIRR	29.26	14.63	14.63	14.63	.	.4067	.1609	.8193	.8968	.
GLYCROUX	.	14.63	14.63	14.63	.	.	.3058	.0366	.0219	.
GONIMACU	.	14.63	29.26	.	.	.	.0073	.0088	.	.
GYPTCAPE	14.63	.	43.89	.	.	.0044	.	.0293	.	.
HARMLONG	.	14.63	.	.	.	.	.0059	.	.	.
LUMBLATR	73.15	336.49	321.86	424.27	117.04	.1024	.4711	.4506	.5940	.0074
LUMBPSEU	.	.	.	.	14.63	.	.	.	.	.0011
MAGEALLE	.	29.26	.	.	.	.	.0146	.	.	.
MAGEPAPI	14.63	.	.	.	.	.0059	.	.	.	.
NEPHCIRR	.	58.52	.	.	.	.	.0263	.	.	.
NEPHHOMB	14.63	.	14.63	29.26	.	.7739	.	.3482	.3658	.
NERELONG	.	14.63	.	14.63	.	.	.0102	.	.0366	.
NOTOLATE	.	.	14.63	.	.	.	.	.0293	.	.
OPHIFLEX	29.26	14.63	.	.	29.26	.0366	.0454	.	.	.0094
OWENFUSI	14.63	.	.	.	14.63	.0102	.	.	.	.0059
PECTAURI	.	.	14.63	.	.	.	.	.0322	.	.
PECTKORE	.	.	.	14.63	14.63	.	.	.	.0073	.0071
PHOLMINU	.	29.26	175.56	29.26	58.52	.	.0146	.0658	.0146	.0020
POLYSPEC	.	.	.	190.19	14.63	.	.	.	.0571	.0005
SPIOBOMB	.	.	14.63	.	.	.	.	.0073	.	.
SPIOFILI	14.63	.	.	.	.	.0059	.	.	.	.
STHELIMI	.	14.63	.	2648.03	14.63	.	.0380	.	.0176	.0066
SYNEKLAT	29.26	.	14.63	29.26	.	.0146	.	.0073	.0146	.
Mollusca :										
ABRAALBA	.	.	.	.	1755.60	.	.	.	.	.0118
CORBGIBB	.	.	29.26	29.26	.	.	.	.3145	.0117	.
CYLICYLI	.	.	.	.	58.52	.	.	.	.	.0071
MYSEBIDE	29.26	307.23	687.61	336.49	1038.73	.0088	.0366	.2750	.0761	.0355
MYSIUNDA	.	.	29.26	.	.	.	.	1.2787	.	.
NATICATE	.	.	.	14.63	.	.	.	.	1.8931	.
NUCUTENU	.	.	.	.	14.63	.	.	.	.	.0000
NUCUTURG	.	.	.	.	14.63	.	.	.	.	.0011
SPISSPEC	14.63	.	.	.	.	.0073	.	.	.	.
THRACONV	.	14.63	.	14.63	.	.	7.7832	.	.0278	.
VENUSTRI	.	.	.	14.63	.	.	.	.	15.6673	.
Crustacea :										
AMPETENU	14.63	.	14.63	.	14.63	.0044	.	.0044	.	.0002
AMPHNEAP	.	.	14.63	.	.	.	.	.0044	.	.
CALLSUBT	117.04	131.67	204.82	395.01	175.56	2.7153	1.6839	2.9889	10.5555	.3287
CORYCASS	.	.	.	.	14.63	.	.	.	.	.3131
DIASBRAD	.	.	.	.	14.63	.	.	.	.	.0002
DIASRATH	.	.	14.63	14.63	.	.	.	.0146	.0146	.
EUDOTRUN	.	.	14.63	.	.	.	.	.0044	.	.
HARPANTE	58.52	.	43.89	.	43.89	.0176	.	.0132	.	.0006
ISOPODA	14.63	.	.	.	.	.0059	.	.	.	.
PERILONG	14.63	.	.	.	.	.0044	.	.	.	.
UPOGDELT	.	.	.	.	14.63	.	.	.	.	.1200
UROTELEG	.	.	.	14.63	.	.	.	.	.0044	.
Echinodermata :										
AMPHFILI	102.41	1843.38	1024.10	1067.99	1858.01	1.7775	7.7656	5.5360	6.7005	2.0192
ECHICORD	14.63	58.52	14.63	43.89	14.63	1.2275	3.9165	1.6137	5.5623	.1141
Rest :										
ASCIDIAC	.	.	14.63	.	.	.	.	3.0840	.	.
NEMERTIN	14.63	43.89	.	43.89	43.89	.0278	.4213	.	.4316	.0132
SIPUNCUL	43.89	58.52	175.56	29.26	14.63	.0293	.0512	.9027	.0073	.0033
PHORONID	.	.	29.26	87.78	73.15	.	.	.0146	.0439	.0020
PLATHYHE	14.63	14.63	.	.	14.63	.0424	.0293	.	.	.0140

Appendix 2-8.

MILZON-BENTHOS II 1991 (compartment : 8)

Density (ind./m²) :						Biomass (g AFDW/m²) :				
Station	81	82	83	84	85	81	82	83	84	85
Number	36	37	38	39	40	36	37	38	39	40
Compartment	8	8	8	8	8	8	8	8	8	8
Date	200691	200691	200691	200691	200691	200691	200691	200691	200691	200691
Species	28	21	23	25	20	28	21	23	25	20
Total/m²	1433.74	1155.77	1316.70	1067.99	1097.25	34.66	18.60	17.91	20.74	26.30
Cluster	1	1	1	1	1	1	1	1	1	1
Polychaeta :										
AONIPAUC	14.63	.	14.63	14.63	.	.0044	.	.0029	.0044	.
CHAESETO	.	.	.	29.26	.	.	.	.	.0073	.
CHAEVARI	146.30	29.26	29.26	29.26	117.04	19.7783	7.6808	8.7736	2.9640	17.0908
DIPLGLAU	14.63	.	.	.	.	.0073	.	.	.	.
GATTCIRR	102.41	43.89	14.63	43.89	43.89	2.8426	1.8302	.0073	.2794	.3862
GLYCROUX	14.63	.	14.63	.	14.63	.2136	.	.3482	.	.1273
GONIMACU	29.26	.	.	.	.	.0146	.	.	.	.
GYPTCAPE	14.63	14.63	14.63	.	14.63	.0059	.0073	.0073	.	.0293
HARMLONG	14.63	.	.	.	.	.0102	.	.	.	.
LANICONC	14.63	.	.	14.63	.	.0029	.	.	.0015	.
LUMBLATR	117.04	131.67	131.67	117.04	102.41	.1639	.1843	.1843	.1639	.1404
MAGEPAPI	.	14.63	14.63	.	.	.	.0029	.0029	.	.
NEPHCIRR	29.26	.	43.89	29.26	43.89	.0146	.	.1492	.5676	.6657
NEPHHOMB	.	43.89	.	.	.	.	.0219	.	.	.
NEPHLONG	14.63	.	.	.	.	.0102	.	.	.	.
NERELONG	.	.	14.63	29.26	.	.	.	.0044	.0995	.
NOTOLATE	29.26	14.63	29.26	.	58.52	.1653	.0219	.5003	.	.5501
OPHEACUM	14.63	.	14.63	29.26	102.41	.0059	.	.0073	.0146	.0307
ORBISERT	14.63	.	.	.	.	.0219	.	.	.	.
OWENFUSI	.	.	.	.	14.63	.	.	.	.	.0117
PECTAURI	.	.	.	14.63	.	.	.	.	.0044	.
PECTKORE	.	.	14.63	14.63	.	.	.	.0073	.0059	.
PHOLMINU	43.89	29.26	58.52	73.15	14.63	.0176	.0117	.0234	.0293	.0059
POLYSPEC	.	87.78	.	43.89	.	.	.0439		.0176	.
SCALINFL	.	.	.	.	14.63	.	.		.	.0073
SIGAMATH	.	.	.	.	29.26	.	.	.	.	.0146
SPIOBOMB	29.26	87.78	14.63	.	14.63	.0088	.0219	.0044	.	.0044
STHELIMI	14.63	.	.	.	.	.0424	.	.	.	.
SYNEKLAT	.	14.63	14.63	.	.	.	.0059	.0059	.	.
Mollusca :										
CORBGIBB	.	.	14.63	29.26	.	.	.	.0146	.0088	.
LEPTSQUA	29.26	43.89	.	14.63	.	.0146	.0146	.	.0044	.
MYSEBIDE	.	102.41	73.15	73.15	.	.	.0410	.0146	.0293	.
Crustacea :										
AMPETENU	.	.	14.63	.	14.63	.	.	.0088	.	.0088
CALLSUBT	58.52	58.52	29.26	14.63	146.30	.2750	2.6729	3.6341	.2882	4.2881
DIASBRAD	.	.	.	14.63	.	.	.	.	.0059	.
EUDOTRUN	14.63	.	.	.	.	.0044	.	.	.	.
HARPANTE	131.67	58.52	87.78	29.26	.	.0395	.0176	.0263	.0088	.
LEUCINCI	.	14.63	.	.	.	.	.0059	.	.	.
UPOGDELT	14.63	.	.	14.63	.	2.6817	.	.	14.0580	.
Echinodermata :										
AMPHFILI	29.26	204.82	512.05	175.56	73.15	.3365	1.2684	2.8338	1.6195	.0439
ECHICORD	14.63	14.63	.	14.63	.	6.6742	2.0877	.	.1697	.
OPHIALBI	.	.	.	.	14.63	.	.	.	.	.3423
Rest :										
NEMERTIN	.	29.26	14.63	14.63	14.63	.	1.9385	.0059	.0541	.1170
PHORONID	29.26	14.63	.	117.04	14.63	.0146	.0073	.	.0585	.0073
PLATHYHE	29.26	.	.	.	.	.0102	.	.	.	.
SIPUNCUL	409.64	102.41	131.67	73.15	234.08	1.2772	.7154	1.3416	.2707	2.4330

Appendix 2-9.

MILZON-BENTHOS II 1991 (compartment : 9)

	Density (ind./m²) :					Biomass (g AFDW/m²) :				
Station	91	92	93	94	95	91	92	93	94	95
Number	41	42	43	44	45	41	42	43	44	45
Compartment	9	9	9	9	9	9	9	9	9	9
Date	200691	200691	200691	200691	200691	200691	200691	200691	200691	200691
Species	27	26	25	28	25	27	26	25	28	25
Total/m²	2135.98	4959.57	2794.33	1316.70	3364.90	5.95	39.99	13.82	20.88	27.50
Cluster	3	1	3	1	1	3	1	3	1	1
<u>Polychaeta :</u>										
ANAIMUCO	.	.	14.63	.	.	.	.	.004	.	.
AONIPAUC	.	14.63	.	14.63	.	.	.0029	.	.0015	.
CHAESETO	.	43.89	87.78	.	.	.	.0146	.0219	.	.
CHAEVARI	.	87.78	.	29.26	29.26	.	15.6936	.	5.6764	4.9903
DIPLGLAU	.	14.63	14.63	.	43.89	.	.0059	.0044	.	.0088
EXOGHEBE	.	.	.	.	14.63	.	.	.	.	.0015
GATTCIRR	29.26	102.41	43.89	29.26	58.52	.0146	.0732	.0219	.0073	1.0226
GLYCNORD	.	29.26	.	.	.	.	.0146	.	.	.
GLYCROUX	.	.	.	14.63	14.63	.	.	.	2.2823	4.9362
GONIMACU	29.26	.	.	.	.	.0541	.	.	.	.
GYPTCAPE	.	.	.	14.63	.	.	.	.	.0073	.
HARMLONG	14.63	.	.	.	.	.0146	.	.	.	.
LANICONC	102.41	.	117.04	14.63	73.15	.0102	.	1.7497	.0015	.0146
LUMBLATR	.	131.67	.	43.89	204.82	.	.1843	.	.0614	.2867
MAGEPAPI	58.52	.	131.67	.	14.63	.0366	.	.0658	.	.0029
NEPHCAEC	73.15	.	29.26	.	.	3.4000	.	.0439	.	.
NEPHCIRR	.	29.26	.	.	14.63	.	.0146	.	.	.0102
NEPHHOMB	.	.	.	29.26	.	.	.	.	.0746	.
NEPHINCI	.	.	.	.	43.89	.	.	.	.	.4491
NERELONG	14.63	.	.	.	14.63	.0102	.	.	.	.0293
NOTOLATE	.	.	.	14.63	14.63	.	.	.	.7534	.0366
OPHEACUM	.	43.89	29.26	.	.	.	.0176	.0088	.	.
OPHIFLEX	14.63	.	29.26	.	.	.0219	.	.0819	.	.
OWENFUSI	.	.	.	14.63	.	.	.	.	.1682	.
PARAGRAC	.	.	.	.	29.26	.	.	.	.	.0029
PECTAURI	.	14.63	.	14.63	.	.	.0088	.	.0293	.
PECTKORE	14.63	131.67	117.04	43.89	102.41	.0044	.0234	.0234	.0088	.0307
PHOLMINU	14.63	585.20	.	117.04	190.19	.0059	.2341	.	.0351	.0571
POECSERP	.	.	14.63	.	.	.	.	.0293	.	.
SCALINFL	.	.	43.89	14.63	29.26	.	.	.0132	.0029	.0088
SIGAMATH	14.63	.	.	.	29.26	.0073	.	.	.	.0146
SOSAGRAC	.	.	.	14.63	.	.	.	.	.0439	.
SPIOBOMB	921.69	73.15	1009.47	29.26	277.97	1.3825	.0219	.4696	.0044	.0410
TERESTRO	.	.	.	14.63	.	.	.	.	.2750	.
<u>Mollusca :</u>										
ABRAALBA	.	.	.	.	87.78	.	.	.	.	.0146
ABRASPEC	307.23	.	.	14.63	.	.0878	.	.	.0059	.
CORBGIBB	.	43.89	.	14.63	.	.	.4213	.	.0059	.
CULTPELL	14.63	14.63	43.89	.	.	.0073	.6496	.0132	.	.
DOSILUPI	29.26	.	.	.	.	.0088	.	.	.	.
ENSISPEC	.	.	.	29.26	.	.	.	.	.0117	.
MONTFERR	.	29.26	43.89	.	.	.	.0146	.0219	.	.
MYSEBIDE	14.63	175.56	.	87.78	204.82	.0044	.0527	.	.0263	.0410
NATIALDE	.	14.63	14.63	.	.	.	.0073	.0073	.	.
NUCUTURG	14.63	.	29.26	14.63	.	.3277	.	.7520	.0073	.
TELLFABU	73.15	.	395.01	.	.	.0219	.	.1170	.	.
THRAPHAS	14.63	.	.	.	.	.0029	.	.	.	.
<u>Crustacea :</u>										
AMPETENU	.	14.63	.	.	14.63	.	.0102	.	.	.0044
BATHTENU	.	.	14.63	.	.	.	.	.0044	.	.
CALLSUBT	73.15	87.78	87.78	131.67	190.19	.3672	1.8741	5.0839	8.1855	7.8388
HARPANTE	87.78	.	14.63	.	29.26	.0263	.	.0029	.	.0088
HARPPECT	.	307.23	.	29.26	.	.	.0922	.	.0088	.
HIPPDENT	14.63	.	.	.	.	.0073	.	.	.	.
PSEULONG	14.63	.	.	.	.	.0029	.	.	.	.
<u>Echinodermata :</u>										
AMPHFILI	73.15	2823.59	87.78	468.16	1609.30	.0922	14.4764	.0176	2.2004	7.6017
ECHICORD	29.26	29.26	14.63	.	.	.0029	3.8667	5.0839	.	.
LEPTINHA	.	14.63	.	.	.	.	2.0350	.	.	.
<u>Rest :</u>										
NEMERTIN	43.89	.	14.63	14.63	.	.0132	.	.0044	.0088	.
PHORONID	29.26	29.26	351.12	14.63	29.26	.0146	.0146	.1756	.0073	.0439
SIPUNCUL	.	73.15	.	29.26	.	.	.1639	.	.9817	.

Appendix 2-10.

MILZON-BENTHOS II 1991 (compartment : 10)

	Density (ind./m²) :					Biomass (g AFDW/m²) :				
Station	101	102	103	104	105	101	102	103	104	105
Number	46	47	48	49	50	46	47	48	49	50
Compartment	10	10	10	10	10	10	10	10	10	10
Date	200691	200691	200691	200691	240491	200691	200691	200691	200691	240491
Species	30	31	29	17	29	30	31	29	17	29
Total/m²	1931.16	4037.88	2662.66	3759.91	5676.44	18.51	7.39	1.44	19.39	0.85
Cluster	2	3	4	3	3	2	3	4	3	3
Polychaeta :										
ANAIMUCO	.	.	43.89	.	.	.	.	.0400	.	.
AONIPAUC	14.63	.	790.02	14.63	.	.	.	.3400	.	.
CHAESETO	.	29.26	.	14.63	.	.	.0100	.	.	.
CHAEVARI	14.63	.	.	.	.	4.6300	.	.	.	.
DIPLGLAU	.	14.63	.	.	.	.	.0100	.	.	.
EUMISANG	.	.	.	.	14.63	.	.	.	.	.
EXOGHEBE	14.63	.	.	.	.	.	.	.	.	.
EXOGNAID	.	.	14.63	.	.	.	.	.	.	.
GATTCIRR	14.63	14.63	.	.	.	.	.	.	.	.
GONIMACU	14.63	29.26	409.64	.	58.52	.	.3200	.1000	.	.0100
GLYCNORD	14.63	.	.	.	.	.0100	.	.	.	.
HARMLUNU	14.63	.	.	.	.	.0100	.	.	.	.
HARMSPEC	.	.	14.63	.	.	.	.	.	.	.
KELLSUBO	.	14.63	.	.	.	.	.	.	.	.
LANICONC	14.63	73.15	.	.	14.63	.	.	.	.	.0900
MAGEPAPI	14.63	1682.45	29.26	3043.04	2545.62	.	2.5400	.0100	7.8400	.2800
NEPHCIRR	.	.	14.63	.	87.78	.	.	.0100	.	.0100
NEPHHOMB	87.78	58.52	.	14.63	58.52	.8900	1.5000	.	1.5400	.1200
NEPHINCI	.	.	29.26	.	.	.	.	.0200	.	.
OPHIFLEX	14.63	.	.	.	.	.0300	.	.	.	.
OWENFUSI	.	.	.	.	117.04	.	.	.	.	.0100
PECTKORE	58.52	190.19	.	.	.	.0100	.0100	.	.	.
PHOLMINU	131.67	14.63	.	.	29.26	.0400	.	.	.	.
PISIREMO	.	.	102.41	.	.	.	.	.0200	.	.
PROTKEFE	.	.	14.63	.	.	.	.	.	.	.
SCALINFL	29.26	14.63	.	.	.	.	.	.	.	.
SCOLBONN	.	.	.	.	14.63	.	.	.	.	.
SIGAMATH	.	14.63	.	.	29.26	.	.0300	.	.	.0200
SPIOBOMB	219.45	716.87	204.82	146.30	117.04	.0300	1.0800	.0400	.0300	.0200
SPIOFILI	.	.	102.41	.	73.15	.	.	.0300	.	.
STHELIMI	29.26	14.63	.	.	.	.1800	.0100	.	.	.
Mollusca :										
ABRAALBA	102.41	102.41	.	.	.	.0400	.0300	.	.	.
CULTPELL	.	29.26	14.63	.	.	.	.	.	.	.
DOSILUPI	14.63	.	.	.	14.63	2.4500	.	.	.	.0900
MONTFERR	14.63	43.89	.	14.63	.	.	.0100	.	.	.
NATIALDE	.	29.26	14.63	.	.	.	.0100	.0100	.	.
SPISSPEC	29.26	73.15	14.63	14.63	.	.	.0100	.	.	.
TELLFABU	73.15	351.12	43.89	234.08	14.63	.0100	.0700	.	.0500	.
Crustacea :										
APHEOVAL	.	14.63	.	.	.	.	.	.	.	.
ARGIHAMA	.	.	29.26	14.63	14.63	.	.	.	.	.
ATYLSWAM	.	.	.	14.63	.	.	.	.	.	.
BATHELEG	.	14.63	.	.	.	.	.	.	.	.
BATHGUIL	.	.	.	.	14.63	.	.	.	.	.
BATHTENU	.	14.63	.	29.26	73.15	.	.	.	.	.
CALLSUBT	73.15	14.63	.	.	.	4.6800	1.3800	.	.	.
CORYCASS	.	14.63	14.63	.	.	.	.	.0100	.	.
DIASBRAD	.	.	73.15	.	.	.	.	.0400	.	.
HARPANTE	73.15	14.63	.	.	.	.0200	.	.	.	.
HIPPDENT	.	.	.	14.63	14.63	.	.	.	.	.
IPHITRIS	.	.	.	.	14.63	.	.	.	.	.
LEUCINCI	.	.	.	.	14.63	.	.	.	.	.
LIOCPUSI	.	.	14.63	.	.	.	.	.0100	.	.
MICRODEU	.	.	14.63	.	.	.	.	.	.	.
PERILONG	14.63	.	.	.	43.89	.	.	.	.	.
PSEULONG	.	.	.	14.63	14.63	.	.	.	.	.
THIASCUT	.	.	14.63	.	.	.	.	.0400	.	.
UROTPOSE	.	.	.	131.67	58.52	.	.	.	.0400	.
Echinodermata :										
ACROBRAC	.	.	.	.	14.63	.	.	.	.	.0100
AMPHFILI	365.75	29.26	.	.	29.26	1.8500	.0400	.	.	.0100
ASTERUBE	14.63	.	365.75	.	.	.	.	.0900	.	.
ECHICORD	14.63	.	.	14.63	.	3.4100	.	.	9.8200	.
ECHIPUSI	.	.	102.41	.	.	.	.	.0300	.	.
OPHIALBI	43.89	.	.	.	14.63	.	.	.	.	.
OPHISPEC	.	14.63	29.26	14.63	.	.	.	.	.	.
Rest :										
ANTHOZOA	.	.	14.63	.	29.26	.	.	.	.	.0500
BRANLANC	.	.	58.52	.	.	.	.	.4800	.	.
NEMERTIN	58.52	160.93	29.26	14.63	1111.88	.0600	.1600	.0500	.	.0800
OLIGOCHA	.	.	43.89	.	.	.	.	.	.	.
PHORONID	336.49	219.45	.	.	1024.10	.1000	.0600	.	.	.0300
PLATHYHE	.	14.63	.	.	.	.	.0300	.	.	.

Appendix 2-11.

MILZON-BENTHOS II 1991 (compartment : 11)

Density (ind./m²) :					Biomass (g AFDW/m²) :			
Station	111	112	113	114	111	112	113	114
Number	51	52	53	54	51	52	53	54
Compartment	11	11	11	11	11	11	11	11
Date	280591	280591	280591	280591	280591	280591	280591	280591
Species	20	22	23	22	20	22	23	22
Total/m²	2969.89	6510.35	3672.13	3686.76	8.35	12.83	54.30	3.08
Cluster	1	1	1	3	1	1	1	3
<u>Polychaeta :</u>								
CHAESETO	.	.	.	73.15	.	.	.	.0300
CHAEVARI	14.63	.	43.89	.	2.0600	.	6.2000	.
DIPLGLAU	14.63	.	43.89	.	.	.	.0800	.
ETEOFOLI	14.63	.	.	.	.0200	.	.	.
GATTCIRR	.	14.63	14.63	.	.	.0100	.0100	.
GONIMACU	.	29.26	.	.	.	.0100	.	.
GYPTCAPE	14.63	.	14.63	14.63	.0100	.	.0100	.0100
HARMLONG	14.63	58.52	.	14.63	.	.0300	.	.
HARMLUNU	.	29.26	.	.	.	.2000	.	.
LANICONC	.	.	.	58.52	.	.	.	.
LUMBLATR	102.41	73.15	131.67	102.41	.1400	.1000	.1800	.1400
MAGEPAPI	.	.	.	190.19	.	.	.	.4800
NEPHHOMB	.	.	43.89	102.41	.	.	1.3200	.1900
OPHIFLEX	.	14.63	14.63	.	.	.0300	.3500	.
OWENFUSI	14.63	.	.	.	.2700	.	.	.
PECTAURI	.	.	29.26	.	.	.	.0400	.
PECTKORE	.	14.63	.	.	.	.	.	.
PHOLMINU	14.63	29.26	117.04	14.63	.	.	.0500	.
SCALINFL	.	131.67	.	.	.	.0300	.	.
SPIOBOMB	.	.	.	2633.40	.	.	.	.3400
SPIOFILI	.	14.63	.	.	.	.	.	.
STHELIMI	14.63	.	.	.	.0800	.	.	.
SYNEKLAT	14.63	.	.	.	.	.	.	.
<u>Mollusca :</u>								
ABRAALBA	1506.89	4623.08	892.43	.	.2200	1.3200	.3600	.
CULTPELL	14.63	.	.	.	.	.	.	.
CYLICYLI	.	14.63	.	.	.	.0100	.	.
DEVOPERR	.	14.63	.	.	.	.	.	.
LEPTSQUA	.	.	14.63	.	.	.	.	.
MONTFERR	.	.	.	14.63	.	.	.	.
YSEBIDE	512.05	146.30	.	43.89	.1500	.0600	.	.0200
NUCUTURG	.	.	14.63	58.52	.	.	.0100	.4800
TELLFABU	.	.	.	87.78	.	.	.	1.1100
THRACONV	.	.	14.63	.	.	.	.2700	.
VENUSTRI	14.63	.	.	.	.7000	.	.	.
<u>Crustacea :</u>								
BATHELEG	.	.	.	43.89	.	.	.	.0100
BATHTENU	.	.	.	87.78	.	.	.	.0300
HARPANTE	58.52	29.26	14.63	.	.0200	.	.	.
CALLSUBT	131.67	277.97	160.93	.	1.2300	6.0200	18.7700	.
GASTSPIN	.	.	29.26	.	.	.	.0500	.
PERILONG	.	.	.	14.63	.	.	.	.
SYNCMACU	.	.	.	29.26	.	.	.	.
UROTPOSE	.	14.63	.	.	.	.	.	.
<u>Echinodermata :</u>								
AMPHFILI	438.90	702.24	1638.56	29.26	2.6300	3.6100	19.2400	.0500
CUCUELON	14.63	.	.	.	.7300	.	.	.
ECHICORD	.	.	29.26	14.63	.	.	6.3600	.1300
LEPTINHA	.	29.26	.	.	.	.9600	.	.
OPHIALBI	.	14.63	.	.	.	.	.	.
OPHITEXT	.	.	.	14.63	.	.	.	.
<u>Rest :</u>								
ANTHOZOA	.	.	14.63	.	.	.	.6400	.
ECHIURID	14.63	.	.	.	.0400	.	.	.
NEMERTIN	.	.	29.26	14.63	.	.	.0500	.0200
PHORONID	.	204.82	336.49	29.26	.	.1000	.2700	.0100
PLATHYHE	.	.	14.63	.	.	.	.	.
SIPUNCUL	29.26	29.26	14.63	.	.	.2900	.0100	.

Appendix 2-12.

MILZON-BENTHOS II 1991 (compartment : 12)

Density (ind./m²) :					Biomass (g AFDW/m²) :			
Station	121	122	123	124	121	122	123	124
Number	55	56	57	58	55	56	57	58
Compartment	12	12	12	12	12	12	12	12
Date	060691	060691	060691	060691	060691	060691	060691	060691
Species	33	21	23	27	33	21	23	27
Total/m²	7914.83	1009.47	6144.60	5325.32	39.58	25.99	1.95	19.29
Cluster	1	1	3	1	1	1	3	1
<u>Polychaeta :</u>								
ARICMINU	.	.	14.63	.	.	.	.0146	.
CHAESETO	29.26	.	14.63	14.63	.0146	.	.0117	.0117
CHAEVARI	14.63	58.52	.	.	6.1212	12.0654	.	.
DIPLGLAU	29.26	.	.	.	.0263	.	.	.
EXOGHEBE	14.63	.	.	.	.0015	.	.	.
GATTCIRR	14.63	102.41	.	.	.6935	.6701	.	.
GLYCROUX	.	14.63	.	.	.	1.7468	.	.
GONIMACU	14.63	.	14.63	29.26	.0073	.	.1127	.0205
GYPTCAPE	.	14.63	29.26	.	.	.0102	.0366	.
HARMLONG	43.89	.	.	14.63	.0176	.	.	.0059
LANICONC	43.89	.	102.41	14.63	.0044	.	.0732	.0015
LUMBLATR	190.19	87.78	14.63	43.89	.2853	.1317	.0219	.0658
MAGEPAPI	.	.	87.78	.	.	.	.2195	.
NEPHCIRR	.	29.26	87.78	.	.	.5267	.0907	.
NEPHHOMB	.	.	.	29.26	.	.	.	.0410
NERELONG	14.63	.	.	.	.3979	.	.	.
NOTOLATE	58.52	.	.	.	.5589	.	.	.
OPHEACUM	.	14.63	.	.	.	.0073	.	.
OPHIFLEX	14.63	.	.	.	.0044	.	.	.
OWENFUSI	43.89	.	.	.	.4213	.	.	.
PECTAURI	29.26	.	.	.	.0775	.	.	.
PECTKORE	175.56	.	.	131.67	.0351	.	.	.0263
PHOLMINU	219.45	14.63	.	73.15	.0380	.0059	.	.0219
POECSERP	.	.	14.63	.	.	.	.0234	.
POLYSPEC	29.26	.	.	.	.0044	.	.	.
SCALINFL	73.15	.	.	14.63	.0073	.	.	.0059
SCOLARMI	.	.	58.52	.	.	.	.2677	.
SPIOBOMB	380.38	.	5076.61	3935.47	.0512	.	.7739	.6540
STHELIMI	.	14.63	.	.	.	.0834	.	.
<u>Mollusca :</u>								
ABRAALBA	292.60	160.93	14.63	175.56	.0585	.0366	.0029	.7491
CORBGIBB	29.26	.	.	.	.0146	.	.	.
CYLICYLI	14.63	.	.	.	.0073	.	.	.
DOSIEXOL	.	.	14.63	.	.	.	.0073	.
MONTFERR	.	29.26	.	.	.	.0088	.	.
MYSEBIDE	1872.64	73.15	58.52	102.41	.1785	.0219	.0117	.0205
NATIALDE	29.26	14.63	43.89	14.63	.0088	.0073	.0351	.0059
NUCUTURG	.	.	.	73.15	.	.	.	.9041
SPISSUBT	.	.	58.52	.	.	.	.0117	.
TELLFABU	102.41	.	87.78	58.52	.0307	.	.0176	.0146
TELLPYGM	.	14.63	.	.	.	.0044	.	.
THRACONV	.	14.63	.	.	.	4.3963	.	.
THRAPHAS	.	.	14.63	29.26	.	.	.0059	.0068
VENUSTRI	.	14.63	.	29.26	.	1.0973	.	3.3634
<u>Crustacea :</u>								
AMPEDIAD	.	14.63	.	.	.	.0102	.	.
ARGIHAMA	.	.	.	14.63	.	.	.	.0044
BATHELEG	.	.	14.63	.	.	.	.0044	.
BATHPELA	.	.	.	14.63	.	.	.	.0044
BATHTENU	.	.	.	14.63	.	.	.	.0044
CALLSUBT	160.93	117.04	.	58.52	6.3699	4.1681	.	3.6048
HARPPECT	146.30	.	.	43.89	.0439	.	.	.0132
HIPPDENT	.	.	204.82	.	.	.	.1214	.
<u>Echinodermata :</u>								
AMPHFILI	3672.13	175.56	29.26	219.45	23.5104	.5867	.0351	1.2011
ECHICORD	.	.	.	14.63	.	.	.	8.3903
ECHIPUSI	.	.	29.26	.	.	.	.0307	.
OPHIALBI	29.26	.	.	.	.0029	.	.	.
OPHITEXT	.	.	.	43.89	.	.	.	.0132
<u>Rest :</u>								
NEMERTIN	29.26	.	58.52	29.26	.0117	.	.0234	.0849
PHORONID	58.52	14.63	.	87.78	.0878	.0219	.	.0439
PLATHYHE	29.26	.	.	.	.4769	.	.	.
SIPUNCUL	14.63	14.63	.	.	.0088	.3833	.	.

Appendix 2-13.

MILZON-BENTHOS II 1991 (compartment : 13)

	Density (ind./m^2) :					Biomass (g AFDW/m^2) :				
Station	131	132	133	134	135	131	132	133	134	135
Number	59	60	61	62	63	59	60	61	62	63
Compartment	13	13	13	13	13	13	13	13	13	13
Date	060691	060691	060691	060691	060691	060691	060691	060691	060691	060691
Species	24	29	20	28	23	24	29	20	28	23
Total/m^2	2384.69	6773.69	2457.84	6802.95	4271.96	5.03	33.44	12.93	12.08	3.07
Cluster	3	3	3	3	3	3	3	3	3	3
<u>Polychaeta :</u>										
ANAIMACU	.	.	.	14.63	.	.	.	.	.0073	.
CHAESETO	.	.	43.89	131.67	29.26	.	.	.3262	.0219	.0146
DIPLGLAU	14.63	.	.	.	.	.0146	.	.	.	.
GLYCNORD	.	14.63	14.63	14.63	14.63	.	.0278	.0805	.0366	.0644
GONIMACU	.	29.26	.	.	.	.	.1507	.	.	.
HARMLONG	29.26	.	.	.	14.63	.0366	.	.	.	.0117
LANICONC	29.26	29.26	.	73.15	102.41	.3233	.0059	.	.0132	.0410
LUMBLATR	.	219.45	.	.	.	.	3.0723	.	.	.
MAGEPAPI	43.89	.	716.87	512.05	468.16	.1097	.	1.7922	1.2801	1.1704
NEPHCIRR	43.89	29.26	.	.	131.67	.0146	1.6210	.	.	.1185
NEPHHOMB	29.26	.	87.78	58.52	.	.8105	.	1.8931	7.2199	.
NEPHLONG	.	.	.	.	14.63	.	.	.	.	.0571
NERELONG	14.63	.	.	.	.	.0146	.	.	.	.
OPHIFLEX	.	14.63	.	.	.	.	.0454	.	.	.
OWENFUSI	.	.	.	14.63	.	.	.	.	.0146	.
PECTKORE	.	131.67	.	14.63	.	.	.0336	.	.0073	.
PHOLMINU	14.63	146.30	.	.	.	.0146	.0278	.	.	.
POECSERP	14.63	.	14.63	.	.	.0146	.	.0293	.	.
SCOLARMI	.	.	.	14.63	.	.	.	.	.0234	.
SCOLBONN	.	.	.	14.63	.	.	.	.	.1536	.
SIGAMATH	.	.	14.63	14.63	.	.	.	.0688	.4521	.
SPIOBOMB	848.54	3043.04	1141.14	4549.93	2633.40	.2282	.4535	.1712	1.2596	.8032
STHELIMI	.	14.63	.	.	.	.	.1156	.	.	.
<u>Mollusca :</u>										
ABRAALBA	58.52	219.45	.	.	.	.0176	.0336	.	.	.
CORBGIBB	.	29.26	.	14.63	14.63	.	.0732	.	.0117	.0117
CULTPELL	.	.	.	29.26	.	.	.	.	.3350	.
CYLICYLI	14.63	58.52	.	.	.	.0073	.0483	.	.	.
DOSIEXOL	.	29.26	.	.	.	.	4.1096	.	.	.
ENSISPEC	.	.	14.63	.	.	.	.	.0029	.	.
LEPTSQUA	.	14.63	.	.	.	.	.0424	.	.	.
MONTFERR	131.67	1053.36	14.63	73.15	.	.0527	.1946	.0029	.0732	.
NATIALDE	58.52	87.78	.	14.63	58.52	.0717	.0732	.	.0146	.1902
NUCUTURG	14.63	29.26	.	.	.	.1141	.3540	.	.	.
TELLFABU	175.56	146.30	204.82	775.39	365.75	.0527	.0439	.9144	.0483	.0732
THRAPHAS	.	.	.	43.89	14.63	.	.	.	.0293	.0073
THYAFLEX	.	14.63	.	.	.	.	.0219	.	.	.
<u>Crustacea :</u>										
ARGIHAMA	.	.	14.63	.	29.26	.	.	.0029	.	.0059
BATHELEG	.	.	14.63	.	14.63	.	.	.0044	.	.0044
BATHGUIL	.	.	.	.	14.63	.	.	.	.	.0044
BATHTENU	43.89	29.26	14.63	.	.	.0132	.0088	.0044	.	.
CALLSUBT	73.15	131.67	.	14.63	14.63	1.5874	9.6997	.	.0892	.1258
CUMASPEC	.	.	.	14.63	.	.	.	.	.0029	.
DIASRATH	.	14.63	.	.	14.63	.	.0117	.	.	.0073
EUDOTRUN	14.63	.	.	.	.	.0073	.	.	.	.
HARPPECT	.	29.26	14.63	.	.	.	.0059	.0029	.	.
MEGAAGIL	.	.	14.63	.	.	.	.	.0029	.	.
PERILONG	.	.	.	.	14.63	.	.	.	.	.0044
SYNCMACU	.	.	14.63	14.63	.	.	.	.0029	.0044	.
<u>Echinodermata :</u>										
AMPHFILI	263.34	804.65	.	43.89	14.63	1.3196	4.7313	.	.0863	.0029
ASTERUBE	.	.	14.63	58.52	29.26	.	.	.0015	.0059	.0029
ECHICORD	.	14.63	14.63	14.63	.	.	8.1694	7.5710	.2443	.
OPHIALBI	.	.	.	29.26	43.89	.	.	.	.0059	.0132
OPHITEXT	117.04	14.63	29.26	.	.	.0263	.0410	.0073	.	.
<u>Rest :</u>										
ANTHOZOA	.	14.63	.	14.63	.	.	.0366	.	.5066	.
HYDROZOA	14.63	.	.	14.63	146.30	.0073	.	.	.0029	.0073
NEMERTIN	58.52	.	43.89	204.82	73.15	.0351	.	.0468	.1273	.3292
PHORONID	263.34	365.75	.	.	.	.1317	.1887	.	.	.

Appendix 2-14.

MILZON-BENTHOS II 1991 (compartment : 14)

	Density (ind./m²) :				Biomass (g AFDW/m²) :			
Station	141	142	143	144	141	142	143	144
Number	64	65	66	67	64	65	66	67
Compartment	14	14	14	14	14	14	14	14
Date	210591	210591	210591	210591	210591	210591	210591	210591
Species	14	13	9	11	14	13	9	11
Total/m²	3394.16	687.61	907.06	614.46	2.52	1.51	1.28	23.81
Cluster	3	4	3	4	3	4	3	4
Polychaeta :								
ARICMINU	.	58.52	.	.	.	.0059	.	.
GONIMACU	29.26	.	.	.	.2985	.	.	.
MAGEPAPI	102.41	102.41	29.26	14.63	.2224	.5545	.0849	.0512
NEPHCIRR	.	117.04	175.56	87.78	.	.0863	.2985	.0907
NEPHHOMB	.	.	14.63	.	.	.	.0600	.
OPHELIMA	.	14.63	.	14.63	.	.0234	.	.2268
PECTKORE	29.26	.	.	.	.0059	.	.	.
SCOLARMI	29.26	43.89	.	.	.1770	.4960	.	.
SPIOBOMB	2472.47	190.19	497.42	219.45	.4682	.0219	.0717	.0380
SPIOFILI	.	.	.	58.52	.	.	.	.0044
STHELIMI	.	.	14.63	.	.	.	.6452	.
Mollusca :								
ABRAPRIS	.	14.63	.	.	.	.2136	.	.
DONAVITT	14.63	.	.	.	.0073	.	.	.
ENSIARCU	.	.	.	14.63	.	.	.	23.3188
TELLFABU	395.01	29.26	.	.	.1185	.0059	.	.
VENUSPEC	.	.	14.63	.	.	.	.0059	.
Crustacea :								
BATHELEG	131.67	.	29.26	.	.0439	.	.0088	.
BATHGUIL	43.89	14.63	.	14.63	.0132	.0044	.	.0044
DIASRATH	14.63	.	.	.	.0029	.	.	.
MEGAAGIL	.	14.63	73.15	117.04	.	.0029	.0146	.0234
PONTALTA	14.63	.	.	.	.0029	.	.	.
PSEULONG	.	14.63	.	14.63	.	.0029	.	.0351
SYNCMACU	.	14.63	.	.	.	.0029	.	.
UROTPOSE	14.63	.	.	.	.0044	.	.	.
Echinodermata :								
ECHICORD	87.78	.	.	.	1.1324	.	.	.
ECHIPUSI	.	.	.	43.89	.	.	.	.0190
Rest :								
NEMERTIN	14.63	58.52	58.52	14.60	.0219	.0863	.0878	.0029

Appendix 2-15.

MILZON-BENTHOS II 1991 (compartment : 15)

	Density (ind./m²) :				Biomass (g AFDW/m²) :			
Station	151	152	153	154	151	152	153	154
Number	68	69	70	71	68	69	70	71
Compartment	15	15	15	15	15	15	15	15
Date	210591	210591	210591	280591	210591	210591	210591	280591
Species	12	19	11	19	12	19	11	19
Total/m²	1536.15	5500.88	321.86	2808.96	2.32	28.75	1.11	1.83
Cluster	3	3	4	3	3	3	4	3
<u>Polychaeta :</u>								
GONIMACU	29.26	14.63	.	.	.1258	.1009	.	.
LANICONC	.	.	.	58.52	.	.	.	.0008
MAGEPAPI	73.15	73.15	.	321.86	.2195	.2195	.	.0767
NEPHCIRR	14.63	73.15	14.63	29.26	.0132	.1200	.0746	1.3238
NEPHHOMB	.	.	.	14.63	.	.	.	.0618
NOTOLATE	.	.	.	14.63	.	.	.	.0414
PECTKORE	.	14.63	.	.	.	.0029	.	.
POLYSPEC	.	.	29.26	.	.	.	.0146	.
SCOLARMI	.	14.63	29.26	.	.	.0439	.3350	.
SIGAMATH	29.26	.	.	14.63	1.0870	.	.	.0581
SPIOBOMB	1009.47	4549.93	58.52	1536.15	.1595	.5340	.0088	.0315
SPIOFILI	.	.	29.26	.	.	.	.0088	.
STHELIMI	.	.	.	14.63	.	.	.	.0000
<u>Mollusca :</u>								
CULTPELL	.	.	.	14.63	.	.	.	.0337
DONAVITT	.	160.93	.	102.41	.	1.5859	.	.0727
ENSIARCU	.	14.63	.	.	.	25.9639	.	.
MONTFERR	.	.	.	29.26	.	.	.	.0008
NATIALDE	.	.	.	43.89	.	.	.	.0013
SPISSPEC	14.63	.	.	.	.0073	.	.	.
TELLFABU	190.19	146.30	14.63	131.67	.6569	.0380	.0073	.0004
<u>Crustacea :</u>								
ARGIHAMA	.	14.63	.	.	.	.0029	.	.
ATYLFALC	.	.	.	14.63	.	.	.	.0002
BATHELEG	29.26	102.41	.	102.41	.0088	.0351	.	.0014
BATHGUIL	58.52	43.89	.	.	.0176	.0132	.	.
DIASBRAD	.	.	.	14.63	.	.	.	.0002
DIASRATH	.	29.26	.	.	.	.0059	.	.
MEGAAGIL	.	29.26	29.26	.	.	.0059	.0059	.
PERILONG	29.26	.	.	.	.0059	.	.	.
PONTALTA	.	29.26	.	.	.	.0059	.	.
PSEUSIMI	.	14.63	.	.	.	.0015	.	.
THIASCUT	.	.	14.63	.	.	.	.0351	.
UROTPOSE	43.89	14.63	.	263.34	.0132	.0044	.	.0036
<u>Echinodermata :</u>								
ECHICORD	.	.	.	58.52	.	.	.	.1111
ECHIPUSI	.	14.63	29.26	.	.	.0293	.0015	.
OPHITEXT	14.63	.	.	.	.0073	.	.	.
<u>Rest :</u>								
BRANLANC	.	.	29.26	.	.	.	.5954	.
NEMERTIN	.	146.30	43.89	29.26	.	.0380	.0234	.0073

Appendix 2-16.

MILZON-BENTHOS II 1991 (compartment : 16)

	Density (ind./m²) :				Biomass (g AFDW/m²) :			
Station	161	162	163	164	161	162	163	164
Number	72	73	74	75	72	73	74	75
Compartment	16	16	16	16	16	16	16	16
Date	060691	060691	060691	060691	060691	060691	060691	060691
Species	24	27	22	20	24	27	22	20
Total/m²	4213.44	7753.90	22135.20	4959.57	53.49	18.57	24.40	17.09
Cluster	3	3	3	3	3	3	3	3
<u>Polychaeta :</u>								
ANAIMUCO	43.89	14.63	14.63	.	.0132	.0044	.0044	.
CHAESETO	14.63	14.63	29.26	146.30	.0073	.0073	.0102	.0878
ETEOFLAV	.	.	.	14.63	.	.	.	.0146
ETEOLONG	.	.	.	14.63	.	.	.	.0146
EUMISANG	14.63	.	.	.	.0044	.	.	.
GONIMACU	.	.	.	14.63	.	.	.	.0146
GYPTCAPE	.	14.63	.	.	.	.0029	.	.
HARMLONG	29.26	.	.	14.63	.0732	.	.	.0044
LANICONC	643.72	219.45	102.41	190.19	.5355	.0263	.0044	.0219
MAGEPAPI	219.45	219.45	73.15	687.61	.6584	.6584	.2195	1.6854
NEPHCIRR	14.63	43.89	29.26	.	.0117	.0073	.0029	.
NEPHHOMB	.	.	43.89	.	.	.	2.3481	.
OWENFUSI	.	.	14.63	.	.	.	.0263	.
PECTKORE	87.78	307.23	14.63	.	.0176	.1302	.0146	.
SCOLARMI	.	.	.	14.63	.	.	.	.0176
SIGAMATH	.	14.63	29.26	14.63	.	.0863	.4067	.0819
SPIOBOMB	1258.18	6071.45	7.12	3291.75	.4608	2.4564	712.3300	1.5815
SPIOFILI	.	.	.	14.63	.	.	.	.0307
STHELIMI	.	.	14.63	14.63	.	.	.0073	.0717
<u>Mollusca :</u>								
ABRAALBA	.	14.63	.	.	.	.3028	.	.
CORBGIBB	.	.	14.63	.	.	.	.2121	
DONAVITT	43.89	14.63	.	58.52	.0293	.0029	.	.0585
ENSISPEC	.	14.63	.	.	.	.0029	.	.
MONTFERR	.	58.52	14.63	.	.	.1258	.0059	.
NATIALDE	102.41	.	.	.	4.1198	.	.	.
NUCUTURG	.	14.63	14.63	.	.	.2765	.3014	.
SPISELLI	833.91	.	.	175.56	46.5336	.	.	12.4311
SPISSPEC	29.26	.	.	.	.0059	.	.	.
TELLFABU	482.79	190.19	336.49	175.56	.0395	.0219	.3789	.7169
<u>Crustacea :</u>								
ARGIHAMA	14.63	58.52	14.63	.	.0044	.0176	.0044	.
ATYLSWAM	14.63	.	.	.	.0044	.	.	.
BATHELEG	14.63	.	.	.	.0044	.	.	.
BATHPELA	14.63	.	.	.	.0044	.	.	.
BATHTENU	.	14.63	.	14.63	.	.0044	.	.0044
CALLSUBT	29.26	73.15	14.63	.	.4740	4.5660	.0819	.
CAPRSPEC	.	.	.	14.63	.	.	.	.0029
DIASRATH	.	29.26	.	.	.	.0059	.	.
LEUCINCI	.	14.63	.	.	.	.0073	.	.
MEGAAGIL	.	.	.	14.63	.	.	.	.0029
MELIOBTU	.	14.63	.	.	.	.0073	.	.
PERILONG	29.26	.	.	.	.0029	.	.	.
PONTALTA	.	.	14.63	.	.	.	.0029	.
<u>Echinodermata :</u>								
AMPHFILI	.	14.63	14.63	.	.	.0073	.0029	.
ECHICORD	.	14.63	14.63	.	.	8.0772	13.2387	.
OPHITEXT	102.41	14.63	29.26	.	.0205	.0029	.0059	.
<u>Rest :</u>								
ANTHOZOA	58.52	87.78	.	14.63	.3658	1.6768	.	.2048
NEMERTIN	73.15	102.41	29.26	58.52	.0761	.0424	.0015	.0380
PHORONID	43.89	87.78	.	.	.0219	.0439	.	.

Appendix 2-17.

MILZON-BENTHOS II 1991 (compartment : 17)

Density (ind./m²) :						Biomass (g AFDW/m²) :				
Station	171	172	173	174	175	171	172	173	174	175
Number	76	77	78	79	80	76	77	78	79	80
Compartment	17	17	17	17	17	17	17	17	17	17
Date	060691	060691	060691	060691	060691	060691	060691	060691	060691	060691
Species	20	20	21	18	18	20	20	21	18	18
Total/m²	3584.35	2238.39	7197.96	3218.60	1799.49	46.98	9.10	110.82	26.66	19.12
Cluster	3	3	3	3	3	3	3	3	3	3
<u>Polychaeta</u> :										
ANAIGROE	.	.	175.56	.	.	.	.	.1024	.	.
CHAESETO	29.26	29.26	307.23	14.63	43.89	.0059	.0454	.0571	.0029	.0132
ETEOLONG	.	14.63	.	.	.	.	.0146	.	.	.
GLYCNORD	.	.	.	14.63	.	.	.	.	.0205	.
HARMLONG	.	29.26	14.63	.	.	.	.0293	.0029	.	.
LANICONC	102.41	73.15	351.12	131.67	73.15	.0293	.0146	.6891	.0146	.0044
MAGEPAPI	1711.71	102.41	555.94	190.19	453.53	7.1628	.2560	1.3899	.4755	1.1338
NEPHCIRR	14.63	87.78	.	14.63	.	.0044	.1404	.	.0146	.
NEPHHOMB	.	.	14.63	.	14.63	.	.	3.0284	.	.6759
PECTKORE	.	.	102.41	.	.	.	.	.3701	.	.
PHOLMINU	.	14.63	.	.	.	.	.0117	.	.	.
SIGAMATH	102.41	.	29.26	14.63	58.52	.2604	.	.5750	.0044	.6466
SPIOBOMB	863.17	1009.47	526.68	2253.02	409.64	.1492	.3087	.2063	.7608	.1697
STHELIMI	14.63	14.63	.	.	.	.1536	.3584	.	.	.
<u>Mollusca</u> :										
DONAVITT	.	424.27	.	.	.	.	2.0497	.	.	.
ENSIARCU	29.26	.	.	.	.	36.9290	.	.	.	.
MONTFERR	.	131.67	43.89	73.15	.	.	.0995	.0527	.0410	.
MYSEBIDE	.	.	.	87.78	14.63	.	.	.	.0366	.0029
NATIALDE	.	29.26	277.97	43.89	14.63	.	.7564	16.1998	.2633	.4930
SPISELLI	.	.	2765.07	.	14.63	.	.	83.0545	.	.6349
SPISSPEC	14.63	.	.	.	.	.0102	.	.	.	.
SPISSUBT	.	.	14.63	.	.	.	.	.4170	.	.
TELLFABU	117.04	58.52	73.15	146.30	14.63	.9890	.0293	.2195	.0293	.0029
THRAPHAS	.	.	.	.	14.63	.	.	.	.	.5047
THYAFLEX	14.63	.	.	.	.	.1653	.	.	.	.
VENUSTRI	.	.	.	14.63	.	.	.	.	1.2933	.
<u>Crustacea</u> :										
ARGIHAMA	14.63	.	.	14.63	.	.0044	.	.	.0044	.
ATYLFALC	.	14.63	.	.	.	.	.0059	.	.	.
BATHELEG	.	43.89	.	.	14.63	.	.0132	.	.	.0044
DIASRATH	87.78	.	.	.	14.63	.0293	.	.	.	.0088
MELIOBTU	.	.	14.63	.	.	.	.	.0102	.	.
ORCHHUMI	.	.	.	.	14.63	.	.	.	.	.0029
PERILONG	14.63	.	.	14.63	.	.0029	.	.	.0029	.
PONTALTA	14.63	.	.	.	.	.0029	.	.	.	.
PSEULONG	.	14.63	.	.	.	.	.0044	.	.	.
SYNCMACU	.	14.63	.	.	.	.	.0029	.	.	.
UROTPOSE	29.26	73.15	.	.	.	.0088	.0219	.	.	.
<u>Echinodermata</u> :										
ASTERUBE	.	.	1770.23	.	.	.	.	.2282	.	.
ECHICORD	.	29.26	14.63	102.41	58.52	.	4.9011	4.0145	23.6655	14.4340
OPHIALBI	29.26	.	14.63	.	.	.1244	.	.0146	.	.
OPHITEXT	.	.	.	58.52	.	.	.	.	.0102	.
<u>Rest</u> :										
ANTHOZOA	14.63	.	14.63	.	29.26	.1183	.	.1168	.	.0568
BRANLANC	.	.	.	14.63	.	.	.	.	.0146	.
NEMERTIN	277.97	29.26	87.78	14.63	497.42	.7812	.0410	.0585	.0044	.3087
PHORONID	87.78	.	29.26	.	43.89	.0439	.	.0146	.	.0219

Appendix 2-18.

MILZON-BENTHOS II 1991 (compartment : 18)

	Density (ind./m^2) :					Biomass (g AFDW/m^2) :				
Station	181	182	183	184	185	181	182	183	184	185
Number	81	82	83	84	85	81	82	83	84	85
Compartment	18	18	18	18	18	18	18	18	18	18
Date	200691	200691	200691	200691	230491	200691	200691	200691	200691	230491
Species	19	17	17	22	13	19	17	17	22	13
Total/m^2	2999.15	4915.68	1111.88	1228.92	395.01	5.24	56.49	1.71	2.49	1.36
Cluster	3	3	4	3	4	3	3	4	3	4
<u>Polychaeta :</u>										
ANAIMUCO	.	43.89	.	.	.	.	.0219	.	.	.
AONIPAUC	.	.	.	.	14.63	.	.	.	.	.0004
ARICMINU	.	.	29.26	.	.	.	.	.0088	.	.
CHAESETO	58.52	.	.	29.26	.	.0293	.	.	.0234	.
GATTCIRR	14.63	.	.	.	.	.0146	.	.	.	.
LANICONC	395.01	687.61	307.23	190.19	14.63	.2472	.2692	.0439	.0658	.0880
MAGEPAPI	1024.10	2706.55	.	190.19	.	1.5274	4.0598	.	.2853	.
NEPHCIRR	.	.	73.15	87.78	117.04	.	.	.0732	.1536	.0337
NEPHHOMB	29.26	14.63	.	43.89	.	2.3540	2.6129	.	1.1221	.
NEPHLONG	.	.	14.63	.	14.63	.	.	.4053	.	.0409
NEPHSPEC	.	.	.	29.26	.	.	.	.	.0117	.
OPHEACUM	.	.	.	14.63	.	.	.	.	.0029	.
OPHELIMA	.	.	29.26	.	14.63	.	.	.0732	.	.0004
PECTKORE	14.63	58.52	.	.	.	.0029	.0117	.	.	.
SCOLARMI	.	.	43.89	29.26	29.26	.	.	.2209	.1302	.0234
SCOLBONN	.	.	87.78	43.89	.	.	.	.7520	.0176	.
SIGAMATH	73.15	.	.	.	.	.3818	.	.	.	.
SPIOBOMB	936.32	117.04	102.41	117.04	14.63	.4330	.0556	.0366	.0351	.0053
SYLLIDAE	.	.	.	.	14.63	.	.	.	.	.0002
<u>Mollusca :</u>										
DONAVITT	.	.	.	14.63	.	.	.	.	.0059	.
ENSISPEC	14.63	.	.	.	.	.0029	.	.	.	.
MONTFERR	87.78	.	.	.	.	.0439	.	.	.	.
MYSEBIDE	14.63	.	.	.	.	.0044	.	.	.	.
NATIALDE	.	.	.	29.26	.	.	.	.	.5018	.
RETUOBTU	14.63	.	.	.	.	.0044	.	.	.	.
SPISELLI	.	921.69	87.78	.	.	.	47.7640	.0263	.	.
SPISSPEC	.	.	.	14.63	.	.	.	.	.0029	.
TELLFABU	.	29.26	.	.	.	.	.0088	.	.	.
<u>Crustacea :</u>										
ARGIHAMA	43.89	29.26	14.63	73.15	.	.0132	.0088	.0044	.0219	.
BATHELEG	.	.	.	102.41	.	.	.	.	.0307	.
BATHGUIL	.	.	.	87.78	.	.	.	.	.0366	.
BATHPELA	.	29.26	29.26	.	.	.	.0088	.0088	.	.
BATHSPEC	.	.	.	29.26	.	.	.	.	.0117	.
BATHTENU	.	.	29.26	.	.	.	.	.0117	.	.
DIASBRAD	43.89	29.26	.	14.63	.	.0219	.0059	.	.0059	.
MEGAAGIL	.	.	14.63	14.63	.	.	.	.0044	.0044	.
PERILONG	.	14.63	.	.	.	.	.0044	.	.	.
PONTALTA	.	.	.	43.89	.	.	.	.	.0132	.
PSEULONG	14.63	29.26	29.26	14.63	.	.0029	.0029	.0059	.0029	.
PSEUSIMI	.	.	160.93	.	.	.	.	.0029	.	.
THIASCUT	.	.	.	.	29.26	.	.	.	.	.0892
<u>Echinodermata :</u>										
AMPHFILI	14.63	.	.	.	.	.0293	.	.	.	.
ECHICORD	.	.	.	.	14.63	.	.	.	.	1.0654
ECHIPUSI	.	.	43.89	.	73.15	.	.	.0219	.	.0044
OPHIALBI	.	29.26	.	14.63	.	.	1.3738	.	.0029	.
<u>Rest :</u>										
ANTHOZOA	58.52	43.89	.	.	.	.0732	.0293	.	.	.
BRANLANC	.	.	.	.	14.63	.	.	.	.	.0075
NEMERTIN	131.67	117.04	14.63	.	29.26	.0512	.2472	.0146	.	.0007
PHORONID	14.63	14.63	.	.	.	.0073	.0029	.	.	.

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