8

NIOZ-RAPPORT 1994 - 12

THE MACROBENTHIC FAUNA IN THE DUTCH SECTOR OF THE NORTH SEA IN 1993 AND A COMPARISON WITH PREVIOUS DATA

G.C.A. Duineveld, J.J.M. Belgers

Nederlands Instituut voor Onderzoek der Zee

Monitoring Macrofauna Dutch Sector of the North Sea

Netherlands Institute for Sea Research (NIOZ)
P.O. Box 59, 1790 AB Den Burg, Texel
The Netherlands

National Institute for Coastal and Marine Management (RIKZ)
Ministry of Transport and Public Works
Den Haag/Haren
The Netherlands

North Sea Directorate
Ministry of Transport and Public Works
P.O. Box 5807, 2280 HV Rijswijk
The Netherlands

ISSN 0923 - 3210

THE MACROBENTHIC FAUNA IN THE DUTCH SECTOR OF THE NORTH SEA IN 1993 AND A COMPARISON WITH PREVIOUS DATA

G.C.A. Duineveld, J.J.M. Belgers

This report presents data of the monitoring program of macrozoobenthos in the Dutch Sector of the North Sea, a cooperation between the National Institute for Coastal and Marine Management (Rijkswaterstaat), the Directorate North Sea (Rijkswaterstaat) and the Department of Benthic Systems (NIOZ)

NETHERLANDS INSTITUTE FOR SEA RESEARCH

Monitoring Macrofauna Dutch Sector of the North Sea

NIOZ-RAPPORT 1994 - 12

1. SAMENVATTING

Dit rapport geeft een overzicht van de resultaten van een macrobenthos onderzoek op het Nederlands Continentaal Plat (NCP) in het voorjaar 1993. Deze bemonstering is de derde in een reeks (BIOMON project) die tot doel heeft lange termijn trends en fluctuaties in het macrobenthos te onderscheiden die een aanwijzing kunnen zijn voor eventuele anthropogene veranderingen in het mariene milieu. Hierbij wordt o.a. gedacht aan effecten van eutrofiering en boomkorvisserij. Aan de hand van de gegevens van de afgelopen 3 jaren aangevuld met eerdere door het NIOZ verzamelde gegevens, te weten 5 stations die in 1990, plus 6 andere stations die in 1986 bemonsterd zijn, is een overzicht gemaakt van trends en fluctuaties in een aantal geselecteerde soorten en kenmerken van de benthische gemeenschap. Het gedeelte dat de werkzaamheden in de laatste drie jaren omvat, is een initiatief van het Rijksinstituut voor Kust en Zee (RIKZ; voorheen Dienst Getijdewateren) van Rijkswaterstaat dat wordt uitgevoerd in samenwerking met de Directie Noordzee (RWS) en de afdeling Benthische Systemen van het NIOZ (Project EXP*BMN; Contract DG-402).

Het monsternet dat gebruikt is tijdens de afgelopen drie campagnes (1991, 1992, 1993) bestaat uit 25 stations verdeeld over 4 raaien dwars op de Nederlandse kust en één raai parallel aan de Zeeuwse kust (Voordelta). Op ieder station zijn 5 boxcoremonsters genomen en geanalyseerd. Aan de hand van de resultaten van de bemonstering in 1991 werd aangetoond dat het monsternet representatief is voor de macrobenthos gemeenschappen die in de zuidelijke Noordzee onderscheiden werden in de ICES North Sea Benthos Survey in 1986. Deze conclusie wordt gedeeld door het EXP*BMN deelproject dat zich bezig houdt met de meiofauna gemeenschappen op het NCP.

Omdat de gegevens van het bodemfauna monitoring project slechts drie opeenvolgende jaren beslaan, zullen alleen ingrijpende veranderingen in de bodemgemeenschap van het NCP duidelijk tot uitdrukking komen. Meer geleidelijk optredende veranderingen kunnen pas vastgesteld worden als er over een termijn van meerdere jaren gegevens beschikbaar zijn en als er ook voldoende inzicht bestaat in de jaarlijkse variaties van het benthos in de Noordzee. Voorbeelden van studies waarbij ondubbelzinnige trendmatige veranderingen in de bodemfauna pas aan het licht gebracht zijn door waarnemingen over periodes van 10, of meer jaren, zijn die uit de Nederlandse Waddenzee (Beukema, 1991; overzicht in Essink & Beukema, 1991) en de Engelse oostkust (Buchanan & Moore, 1986). Hoewel er voor de stations in deze studie vroegere gegevens (1990 en 1986) zijn, voegen de gegevens uit 1990 slechts een jaar aan de tijdspanne toe en betreft het slechts 5 van de 25 stations. De gegevens uit 1986, afkomstig van 6 stations uit de ICES North Sea Benthos Survey, bieden wellicht meer ruimte voor enige speculaties over lange-termijn veranderingen maar dragen weinig bij aan meer inzicht in de jaar-tot-jaar variaties. Een andere beperking m.b.t. de bruikbaarheid van de vroegere monsters is dat ze niet altijd behandeld zijn

overeenkomstig de huidige werkwijze.

Gelet op de potentiele oorzaken voor veranderingen in de bodemgemeenschap op het NCP is het aantal soorten in de analyses beperkt tot diegene waarvan een verband tussen dichtheid en verstoringsbron is beschreven. Voorbeelden zijn de voor fysische verstoring gevoelige tweekleppige schelpdieren *Tellina* en *Spisula* en de kokerwormen *Spiophanes* en *Lanice*, en voorts de voor eutrofiering en lage zuurstofspanningen gevoelige slangster *Amphiura*. Als contrast is deze set aangevuld met soorten die een voldoende wijde verspreiding en dichtheid op het NCP hebben om zowel kleine als grootschalige veranderingen te kunnen vaststellen. De analyses zijn verder uitgevoerd met een aantal algemene parameters, die niet alleen de som van verschuivingen op soortniveau beschrijven, maar ook indicatief zijn voor meer fundamentele veranderingen in de gemeenschap. Deze set parameters bestaat uit de twee verschillende diversiteits indices van de totale gemeenschap plus het soortenaantal, dichtheid, biomassa en produktie van zowel de totale gemeenschap als van de aparte phyla. De schattingen voor de produktie zijn voor dit doel afgeleid van de gegevens over de dichtheid en biomassa.

Voorafgaand aan de variantie en trend analyses is een DECORANA ordinatie gemaakt van de jaarlijkse gemiddelde dichtheid van alle soorten inclusief de vroegere waarnemingen. De uitkomst van de ordinatie laat zien dat er tijdens de periode 1991-1992 geen grootschalige veranderingen zijn opgetreden in de samenstelling en dichtheid van de bodemgemeenschappen op de bemonsterde stations. Waarnemingen die behoren bij eenzelfde station maar in het ordinatie diagram relatief ver verwijderd zijn van de waarnemingen uit voorafgaande of volgende jaren, betreffen voornamelijk gegevens uit het jaar 1992. De stations met de afwijkende 1992 waarnemingen zijn reeds in het rapport over de 1992 survey gesignaleerd (Duineveld & Belgers, 1993) waarin ook een verklaring voor deze afwijkingen is gezocht. Het feit dat de 1993 waarnemingen van de betreffende stations dichter bij die van 1991 liggen, versterkt de eerdere verklaring dat de afwijkende 1992 data te wijten zijn aan bemonsterings variatie. Verder laat het ordinatie diagram zien dat de waarnemingen, afkomstig van de 11 stations die tevens in 1986 of 1990 bemonsterd zijn, zonder uitzondering dichtbij de overeenkomstige waarnemingen uit de periode 1991-1993 kopmen te liggen. Ook over deze langere periode zijn er op de betreffende stations geen grote verschuivingen gevonden in de samenstelling van de bodemfauna.

De analyse van fluctuaties in dichtheid van de geselecteerde soorten en de gemeenschapskenmerken, is zowel voor de individuele stations als ook voor groepen van stations uitgevoerd. In dat laatste geval is gebruik gemaakt van de groepering zoals die gevonden is op grond van de resultaten van 1991. Deze indeling bestaat uit 4 stationsgroepen die min of meer overeenkomen met geografische gebieden, te weten een groep van stations in het zuidelijke deel en een tweede groep in het centrale en noordelijke deel van de Oester Gronden, een derde groep van stations langs de Nederlandse kust en een vierde groep stations in de zuidelijke Bocht aangevuld met een station van de Dogger Bank.

De analyses met betrekking tot groepen van stations leverde voor wat betreft de soorten zeer weinig significante dichtheidsveranderingen op. In het tijdvak 1991-1993 werd alleen een achteruitgang gevonden voor de slangster *Amphiura filiformis* in de zuidelijke Oester Gronden. Nadat de enkele waarneming van 1990 werd toegevoegd verdween deze trend echter. Bovendien laat de soort op de individuele stations geen significante trends zien en verschillen de dichtheidsfluctaties per station. Niettemin zijn de lage dichtheids waarden van *Amphiura* in 1993 vermeldenswaard, omdat uit ander onderzoek blijkt dat deze vaak dominante soort zeer stabiel in zowel aantal als grootteverdeling kan zijn. Toevoeging van vroegere waarnemingen bracht een afname van *Lanice conchilega* (kustzone) en *Scoloplos armiger* (centrale Oester Gronden) over de periode 1986-1993 aan het licht. Blijkbaar heeft de achteruitgang van deze soorten zich voltrokken in de periode voorafgaand aan 1991, maar een duidelijke oorzaak kan gelet op de geringe veranderingen bij de andere soorten, niet gegeven worden.

Op de individuele stations werd meer jaar-op-jaarvariatie in de dichtheden van de geselecteerde soorten waargenomen, met name bij de Polychaeten *Spiophanes bombyx*, en *Nephtys cirrosa*. Wanneer ook de gegevens van 1990 en 1986 werden toegevoegd, nam het aantal significante jaar-op-jaarvariaties en trends sterk toe. Voor het merendeel waren deze nieuwe significante veranderingen toe te schrijven aan de relaief sterk afwijkende dichtheidswaarden voor de vroegere waarnemingen. Slechts in enkele gevallen versterkte een eerdere waarneming de trend over het tijdvak 1991-1993, zoals de toename van *Amphiura filiformis* op station RHC4 (centrale Oester Gronden). Uit de analyse blijkt verder dat er op geen enkel station een duidelijk verband is tussen de variaties van soorten die gevoelig zijn voor verstoring van de bodem, zoals de Polychaeten *Spiophanes bombyx*, *Lanice conchilega* en de tweekleppigen *Tellina fabula* (en voor een deel van de stations) *Spisula subtruncata*.

De analyse van de jaar-op-jaar variatie van gemeenschapskenmerken (diversiteit, dichtheid, biomassa en produktie) over grotere deelgebieden (d.w.z. stationsgroepen) van het onderzoeksgebied bracht slechts een gering aantal significante trends en fluctuaties over de periode 1991-1993 aan het licht. De vier gevonden trends waren in alle gevallen positief: biomassa van Polychaeten en de restgroep in de zuidelijke en die van Crustaceeen in de centrale Oester Gronden, en het aantal soorten Polychaeten in de kustzone. Belangrijk is dat er geen significante trend of verschillen gevonden werden in het totale aantal soorten, individuen en biomassa. Toevoeging van de gegevens uit 1990 en 1986 bracht hier geen verandering in. De significante variatie (geen trend) in de diversiteit van de kustzone en totale biomassa van de centrale Oester Gronden is moeilijk te interpreteren aangezien geen significante variaties gevonden werden in het aantal soorten en individuen noch in de biomassa van aparte phyla.

In tegenstelling tot op de stationsgroepen, was de variatie van gemeenschapskenmerken op de individuele stations veel groter, vooral als gegevens van 1986 of 1990 werden toegevoegd. Omdat verstoring van een natuurlijke, stabiele bodemgemeenschap door bijvoorbeeld bodemvisserij, olievervuiling of organische verrijking, in het algemeen gepaard gaat met een verandering in het aantal soorten vaak in combinatie met de totale dichtheid en biomassa (Pearson & Rosenberg, 1978; Rachor, 1982; Kröncke et al., 1992), is er een selectie gemaakt van stations waar deze drie parameters gelijktijdig veranderd zijn in de periode 1991-1993. Omdat noch de ordinatie noch de afzonderlijke analyses aanwijzingen opleverden voor zeer drastische verstoring op een van de stations in de periode 1991-1993, zijn stations geselecteerd met trendmatige veranderingen in zowel soortenaantal, dichtheid als biomassa. Deze gelijktijdige trends zouden mogelijk kunnen duiden op een langzame verandering in de structuur van de gemeenschap als gevolg van bijvoorbeeld een herstel na een vroegere verstoring of een gestage toename van de organische verrijking. Voor een beoordeling van de waargenomen trends als positieve dan wel negatieve ontwikkeling is geen vergelijkingsmateriaal voorhanden. Hoewel studies naar effecten van organische (Pearson & Rosenberg, 1978) en olievervuiling (b.v. Kröncke et al., 1992) op sublittorale gemeenschappen meerendeels habitats betreffen die zwaar getroffen zijn, blijkt dat het soortenaantal doorgaans de meest eenduidige negatieve correlatie vertoont met de graad van verstoring. Daarom zijn de waargenomen veranderingen op de geselecteerde stations voorlopig gekwalificeerd op grond van de trend in soortenaantal.

Op alle stations met gelijktijdige veranderingen in meerdere gemeenschaps-kenmerken is er sprake van significante trends in zowel het totale aantal soorten als in de totale dichtheid; trends in totale biomassa komen nauwelijks voor. Gelijktijdige opwaartse trends in zowel soortenaantal als dichtheid, hier als positieve onwikkeling gezien, werden aangetroffen op de stations VD1 (Voordelta), N30 (zuidelijke Bocht) en SM37 (Dogger Bank). Op de volgende stations werd een gelijktijdige neerwaartse trend in soortenaantal en dichtheid, d.w.z.een negatieve verandering, gevonden: META2 (zuidelijke Oester Gronden) en N70 (Zuidelijke Bocht). Minder duidelijk is de situatie op station TS30 waar het totale aantal soorten toeneemt, hetgeen volgens het gehanteerde criterium een positieve verandering is, maar waar de totale dichtheid afneemt, terwijl de biomassa niet varieert. Station R3 waar sprake is van significante verschillen (geen trend) in zowel aantal soorten als totale dichtheid is buiten beschouwing gelaten omdat de waarnemingen uit 1992 van dit station zeer afwijkend zijn (zie Duineveld & Belgers, 1993).

Wanneer de vroegere waarnemingen bij de analyse betrokken worden blijken deze de opgaande trends op SM37 te versterken. Bovendien komen stations TS100 en SM20 in de zuidelijke en RHC4 in de centrale Oester Gronden naar voren als plaatsen waar zich in de periode 1986-1993 belangrijke veranderingen voltrokken zouden hebben. Voor wat betreft TS100 en RHC4 zijn dit opwaartse trends en voor station SM20 neerwaartse trends in soortenaantal en dichtheid. In het geval van RHC4 en SM20 (beide met een 1986 waarneming) zou er sprake kunnen zijn van een reeele verandering omdat deze zich voltrokken heeft in een periode van 5 jaar (1986-1991), waarbinnen echter geen waarnemingen gedaan zijn. Meer twijfel bestaat er over TS100 waar simultane veranderingen, o.a. een verdubbeling van het aantal soorten en individuen, zich in één jaar zou hebben afgespeeld. Grote aantallen juvenielen zijn echter in 1991 niet aangetroffen.

Resumerend kunnen de volgende conclusies getrokken worden:

*Tijdens de periode 1991-1993 hebben zich over geen van de vier deelgebieden van het Nederlands Continentaal Plat ingrijpende simultane veranderingen voorgedaan, in dichtheden van geselecteerde soorten, noch in algemene kenmerken van de totale bodemgemeenschap (diversiteit, dichtheid, biomassa).

*Uit de analyse van dichtheden van geselecteerde soorten die gevoelig zijn voor fysische verstoring van de zeebodem door boomkorvisserij blijkt dat er op geen enkel station sprake is van overeenkomstige jaar-op-jaar veranderingen of trends in de dichtheden van deze gevoelige soorten. Aangenomen dat fysische verstoring meerdere soorten tegelijk zal beinvloeden, kan geconcludeerd worden dat er geen aantoonbare effecten van b.v. boomkorvisserij zijn aangetroffen.

*Op een beperkt aantal stations lijkt er sprake te zijn van negatieve dan wel positieve veranderingen in de structuur van de gemeenschap. Onder positieve verandering wordt een gelijktijdige opwaartse trend in zowel soortenaantal als totale dichtheid verstaan (stations META2 en N70). Een negatieve verandering (stations VD1, N30 en SM37) omvat een neerwaartse trend in beide parameters. Uit een multivariate analyse van de hele set stations blijkt dat deze veranderingen, afgemeten aan de verschillen in fauna samenstelling tussen de stations onderling, relatief klein zijn.

*Omdat de gelijkvormige trends op de bovengenoemde stations zich niet voortzetten over grotere deelgebieden (stationsgroepen) moet de verklaring gezocht worden bij lokale factoren (of natuurlijke variatie) in plaats van op grotere schaal opererende faktoren zoals eutrofiering. Een tweede aanwijzing dat veranderingen in de graad van eutrofiering waarschijnlijk geen grote rol speelt in de trends op de stations is het feit dat de biomassa stabiel is gebleven. Immers onderzoek in de Waddenzee en met het NCP vergelijkbare sublittorale habitats (Kattegat/Skagerrak) heeft aangetoond dat de biomassa toeneemt bij een toename van de eutrofiering; afname van de eutrofiering zal omgekeerd leiden tot een teruggang van de biomassa.

*Omdat op geen van de stations duidelijke aanwijzingen gevonden zijn voor fysische verstoring (zie boven), resteert als mogelijke anthropogene oorzaak voor de neerwaatse trends op META2 en N70 locale vervuiling door b.v. olieof gasboringen. Binnen een straal van enkele mijlen bevinden zich echter geen boorlokaties.

*Ook voor de opwaartse trends op stations VD1, N30 en SM37 zijn geen voor de hand liggende anthropogene oorzaken te geven. Mogelijk is hier sprake van een herstel na een fysische verstoring in de voorliggende periode.

2. INTRODUCTION

This report summarizes the data from a macrobenthic survey in the Dutch Sector of the North Sea in spring 1993, and compares the results of this survey with previous data obtained in the framework of this monitoring project and the ICES North Sea Benthos Survey in 1986. The aforementioned benthos monitoring project is an initiative of the National Institute for Coastal and Marine Management (formerly: Tidal Waters Division) of Rijkswaterstaat (RWS) in cooperation with the department of Benthic Systems of NIOZ (contract DG-402), with the primary objective of gaining insight into year-to-year variations and trend-like changes of the macrobenthic infauna in the North Sea.

Under the current contract three annual surveys, comprising 25 sampling stations, have been made for this purpose (Duineveld, 1992; Duineveld & Belgers, 1993), the 1993 survey being the third in succession. Prior to these surveys, five of these 25 stations were sampled in spring 1990 by Holtmann et al. (1990). The ICES North Sea Benthos Survey (NSBS), that was carried out in spring 1986, was initiated to obtain maps of the distributions of the macro-and meiofaunal assemblages and their standing stock in the entire North Sea (Künitzer et al., 1992; Heip et al., 1992). The need for such baseline data, which till then had largely been sketchy and incomplete, arose from the growing concern about long-term effects of human impacts (e.g. fisheries, eutrophication) on the North Sea benthic ecosystem. Because earlier records are generally incompatible with those acquired by the NSBS and this monitoring project (e.g. different sampling methods), the NSBS data are taken as a baseline in delimiting recent changes in the benthic fauna of the North Sea. For this reason, the set of stations selected for the monitoring project was chosen in such a way that 6 stations from the grid covered by the North Sea Benthos Survey were included (see Fig. 1).

The results from the 1991 survey showed that, in accordance with their selection, the stations adequately cover the major macrobenthic and meiobenthic communities that were previously distinguished in the Dutch Sector during the ICES-NSBS (Duineveld et al., 1990; Huys & De Smet, 1992). The report dealing with the 1992 survey (Duineveld & Belgers, 1993), mainly discussed changes in species abundances and changes in community attributes and species densities in the period 1991-1992. It was shown that in spite of significant changes at few individual stations, which could be partly attributed to sampling variance, no large-scale changes took place in the macrobenthic fauna of the area covered by the stations.

The present report gives an overview of the variations and trends in the data from the past three surveys (1991-1993) together with data from 1986 (ICES-NSBS) and 1990 (Holtmann et al., 1990). It should be realised that the short observation span of only three years for most of the stations puts a limit to statements about for example effects of eutrophication. Published positive effects of eutrophication on benthic habitats were all exposed by timeseries at least covering a decade (Buchanan & Moore, 1986; Beukema, 1991; Essink & Beukema, 1991). In general, any inferences on trends of species or their attributes within a 3 year period should be treated with caution. This also applies when earlier samples are included, since not the same persons were involved in the collection, sorting and identification. With these reservations in mind, the analyses are focussed on the occurrence of more drastic changes in benthic assemblages such as may be caused by incidental beamtrawling or hydrographic events (e.g. O_2-deficiency). For this purpose we use a set of indicator species supplemented with a collection of robust attributes that surpass the level of individual species and express some fundamental trait of the community. Because a severe perturbation is likely to affect more than one feature of the community simultaneously, attention will be given to concurrent changes in species types and attributes. We recognize at forehand that we have no information that allows us to assign any of these causes to changes we may observe. Only the sign (decrease or increase) in combination with the spatial extension of changes may give some indication for its possible cause. For this reason, we also applied our analyses to groups of stations though the sampling design may not be optimal for this purpose (see van der Meer, 1994).

3. MATERIAL AND METHODS

Sampling and sorting of the samples was done in accordance with the prescribed standard methods for macrobenthos sampling in the Dutch Sector of the North Sea (Essink, 1991). A detailed description of the methodology used can be found in Duineveld (1992). Only the most relevant aspects of the methods will be summarized in the following sections.

3.1. Sampling and sorting

The positions of the sampling stations are shown in Fig. 1. At each station 5 boxcore samples (0.068 m^2 each) were taken with the RV. Holland while the ship was anchored. The majority of the stations were sampled in the period 26 April-6 May 1993. Two stations in the Voordelta, viz. VD2 and VD3 were visited on 13 April 1993. Station SM1 was finally sampled on 24 May 1993. Animals were identified to species level, except for some notoriously difficult taxa such as Anthozoans and Nemertini, and counted. Sizes (nearest 0.5 mm) were only recorded for molluscs. When the individuals belonging to a species were composed of a mixture of newly settled juveniles and older animals, this was recorded. However, no discrimination between juveniles and adults was made in the tables showing the density per species (Appendix 2) nor in any calculations involving abundances of species.

3.2. Ashfree Dry weight

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

- Polychaetes, worms, larger crustaceans, ophiuroids - indirectly, by converting the (blotted) wet weight into AFDW by means of conversion factors provided by Rumohr et al. (1987). Wet weights were measured with a Mettler PJ300 balance to the nearest mg.
- Molluscs, echinoids - by means of length-AFDW relations of the form $W=aL^b$ (W=AFDW and L=length in mm's)
- Remaining taxa - directly, by drying a sample at 60 °C for 60 hours and subsequently incinerating it at 520 °C for two hours (Duineveld & Witte, 1987).

Single, small amphipods and cumaceans were assigned an average individual AFDW of 0.0005 g. The same figure is used by Holtmann & Groenewold (1992) in their analysis of macrobenthos from the MILZON BENTHOS II project in the southern North Sea. This estimate is based on previous determinations of the AFDW of the taxa in question (Duineveld; Holtmann, unpubl.).

3.3. Classification and statistics

Changes in species assemblages at the separate stations in the period 1986-1993 were, similarly as in the 1992 report, depicted by means of a DECORANA ordination (Hill, 1979) of the joined datasets. The input data in this case consisted of untransformed mean abundances in order to emphasize any deviation. For the statistical analysis of changes in species attributes (density and biomass), all data were $\log(x+1)$ transformed. The same holds for community attributes such as total biomass, density and diversity. Diversity, like in the reports on the 1991 and 1992 surveys, is represented by three variables: species density (i.e. the number of species per sample), Shannon-Wiener index (H', with logarithm to the base e) and the Simpson's Index (SI) for dominance. Following is the relation between these diversity measures and Hill's diversity numbers (N_0, N_1, N_2; Hill, 1973) which have been used in the MILZON-reports on the spatial distribution of the benthic fauna in the Dutch Sector of the North Sea (Holtmann & Groenewold, 1992, 1994): N_0= species density, N_1= exp(H') and $N_2=1/SI$.

Because disturbance or degradation of benthic communities usually results in changes in both total density and biomass, we have, in accordance with Warwick & Clarke (1993), combined these two variables into a measure of community production.

However, instead of using their single production formula for all phyla, we calculated production (P) for each phylum separately by means of formulas given by Brey (1990) which include estimates for mean annual biomass (B) and mean individual weight (W) according to:

$$log10(P)=a + c_1 \times log10(\overline{B}) + c_2 \times log10(\overline{W})$$

For the mean annual biomass we substituted total biomass of the phylum in the samples while mean individual dry weight was approximated by dividing biomass and density. Adding the production values for the separate phyla gave an estimate for the production by the whole community. The coefficients a, c_1, and c_2 for the different phyla were taken from Brey (1990).

Differences in species and community attributes at separate stations during the period of investigation were tested for significance with a one-way ANOVA (Sokal & Rohlf, 1981). In cases where variances remained unequal after transformation, we used a Kruskal-Wallis-test which is the non-parametric equivalent of a one-way ANOVA. For selected variables, comparison plots have been made showing the mean values for each year in the period 1986-1993 together with their respective 95 % comparison limits (T'-method, Sokal & Rohlf, 1981). Non-overlapping comparison limits in these plots denote a significant difference between corresponding means. Means and comparison limits were back-transformed before being plotted. Congruous changes at the level of station-groups (clusters) were determined by means of a two-way ANOVA. Stations were, similarly to the 1992 report, grouped on the basis of the clusters derived from the 1991 data. For a discussion of the various ANOVA-models available and their implications, the reader is referred to Van der Meer (1994). For the present dataset we used a MIXED model where stations are regarded as randomly selected sites representing subregions of the North Sea.

Trends of variables at separate stations were determined with the linear regression model **Y=a+bX** with sampling year as **X** and the log(x+1) transformed variables as **Y**. The distribution of significant trends in the sampling area is depicted in maps with symbols of which the shape and size depends on the sign and magnitude of the regression coefficient (slope). The shade of the symbols varies according to the r^2 of the regression equation. For the regression analysis with the pooled data of stationgroups we used a similar model as with the two-way ANOVA whereby the year effect was tested against the interaction term (year*station) as error source. This is equivalent to a T-test of the group of regression slopes of individual stations against zero (i.e. no regression). SYSTAT 4.1 (SYSTAT inc., Evanston, USA) was used for the statistical procedures as well as for the production of the graphics.

3.4. Sediment analysis

At each station shown in Fig. 1, 2 cores (3.4 cm diameter) were extracted from an intact boxcore sample and subsequently pooled for laboratory analysis of the sediment composition (e.g. grainsize, calcium carbonate). The results of the grainsize analysis (Malvern) of these samples were provided by the Middelburg laboratory of the National Institute for Coastal and Marine Management (formerly: Tidal Waters Division). Two parameters were derived from the grainsize data: the percentage (by weight) of mud (particles $< 63\mu m$) and the median grainsize. The latter value was calculated using the entire size range (thus including the mud fraction).

4. RESULTS

Because the data for the years 1986 and 1990 only apply to 11 of the 25 stations, the entries for the individual stations in the Table 3 and 4 cover only the period 1991-1993. Where the addition of earlier observations led to a significant change in the entries, this will be discussed. The comparison plots (Figs. 3,5 and 7) provide the full information on differences between years including those prior to 1991.

4.1. Changes in sediment composition 1991-1993

Table 1 shows the year-to-year variation in sediment grainsize at the sampling stations in the period 1991-1993. Relatively little variation was found at the northern stations (Oyster Ground clusters 1 & 2, SM20 and SM37). At the sandy stations in the southern part of the Dutch Sector more variation in sediment grainsize was recorded. At the following stations the year-to-year variation in sediment texture appears to exceed the spatial variation among replicate cores (only data from 1991-survey available): R3, R50, N10, W30 and W70. The 1992-values for median grainsize and mud content at stations R3 and R50 clearly differed from those in 1991. As the 1993 data for the two stations are again in line with those of 1991, the abberrant 1992 values are likely due to sampling error which in the case of R3 also gave rise to large discrepancies in the fauna composition (see Duineveld & Belgers, 1993). At station N10 a lower median grainsize was found in 1993 due to a higher percentage of fine sand; the percentage mud was not widely different from 1992. The sediment texture at stations W30 and W70 displays a high degree of year-to-year variation, though the 1991 data indicate that there is also substantial amount of spatial variation at these two stations. In contrast to the erratic variations of the two parameters at W30, the values for median grainsize at W70 seem to point at a increasing proportion of coarser sand particles. The percentage mud at W70, however, does not show a concomittant trend.

The variation in the sediment grainsize at both stations may be related to the fact that they are located amidst sandwaves which are seasonally eroded and, moreover, are thought to migrate in northerly direction (van Alphen & Damoiseaux, 1989).

4.2. Distribution of biomass, diversity and species in 1993

The distribution of the species over the stations (presence/ absence) is summarized in Appendix-1, which also provides the full scientific names of the species. The basic data on species abundances, biomass and diversity per sampling station are given in Appendix-2. Table 2 presents, similarly to the previous two reports, an overview of mean values for the principal characteristics of the four TWINSPAN clusters that were distinguished in 1991.

4.3. Comparison of species assemblages from 1986 to 1993

Fig. 2 shows the result of a DECORANA ordination of the combined datasets from the period 1986 to 1993. For the sake of transparency stationnames have been replaced by codes and years by their last two digits. Fig. 2 closely resembles the DECORANA ordination of the combined 1991 and 1992 data given in the second report (Duineveld & Belgers, 1993), i.e. the muddy Oyster Ground stations arranged along one axis and the sandy stations in the southern North Sea along the perpendicular axis. Furthermore Fig. 2 shows that a number of stations had a quite coherent assemblage throughout the entire period of investigation. This holds most of all for the Oyster Ground stations, of which the 1986 (or 1990 point in the case of TS100) observations are quite close to those from proceeding years. But also some southern stations, such as META1, N2, N10, W30 and W70, produce compact clusters. The assemblages of the remaining southern stations show a greater degree of scattering. Within the clusters of stations R3, N30 and R50, the 1993-datapoints are closest to the 1991 ones, with the 1992-datapoints being the most distant ones. For the coastal stations SM1 and VD3, on the other hand, the assemblages of consecutive years appear to move apart in one direction, possibly pointing at a continuing change.

4.4. Variations in density of selected species

The species set discussed in this section is a selection composed of species with a sufficiently wide distribution and abundance in the study area. Moreover, the species are considered to be either characteristic for a specific subregion or sensitive to physical disturbance. The characteristic species were selected on basis of the

TWINSPAN classification made in 1991 (Duineveld, 1992) while the sensitive species were taken from Bergman et al. (1990). Results are first presented for single stations followed by the results for stationgroups (subregions).

4.4.1. Single stations

Significant differences in density of selected species during the period 1991-1993 were assessed by means of a one-way ANOVA, of which the results are given in Table 3. Trends in density of selected species at individual stations were resolved with a linear regression analysis. Significant trends during the period 1991-1993 are marked in Table 3 by means of the symbols > (increasing density) and < (decreasing density). Figs. 3*a-n* show for each species the annual mean densities plus comparison intervals including those of earlier observations. The distribution of trends over the sampling area is, for each species separately, shown in Figs. 4*a-d* by means of symbols of which the size varies with the height of the slope.

For each of the selected species we found significant fluctuations at one or more stations during the period 1991-1993. There is, however, a distinct difference among the species in the incidence of significant variations. Two species stand out with a high number of significant variations and trends which are both negative and positive, viz. the Polychaetes *Spiophanes bombyx* and *Nephtys cirrosa*. The high spatial and temporal variability in the density of these species could point at an opportunistic character (e.g. high reproductive and dispersive potential), but sound autoecological information about the two species is not available. Density of the amphipod *Urothoe poseidonis* appears to be quite variable too, but only at the coastal stations. Noteworthy is furthermore the variation in the density of *Amphiura filiformis* at SM58 and RHC4 (Oyster Ground), though this species is believed to be quite stable (Duineveld & van Noort, 1986). With data from 1986 and 1990 included in the analyses, the overall number of significant fluctuations and trends increased, and most notably for the tiny bivalve *Mysella bidentata* (results not shown in Table 3). Only rarely, trends from the period 1991-1993 were lost because of the addition of earlier data, one of the few examples being *Amphiura filiformis* at SM58. Cases where the addition of an earlier observation clearly strengthened the trend over the 1991-1993 interval have been marked in Table 3 (> > or < <). The new trends and fluctuations that were caused by expansion of the dataset could in almost all cases be ascribed to the relatively great difference between the early observation and later observations as is evident from the comparison plots in Fig. 3. Furthermore, it can be seen in Table 3 that there are no concurrent declines in species that are considered to be vulnerable to physical disturbance of the seabed, such as the Polychaetes *Lanice* and *Spiophanes* and the bivalves *Tellina* and *Spisula* (see Bergman et al., 1990). With the earlier data included we neither found parallel decreases in densities of sensitive species.

4.4.2. Subregions

Equally interesting in the context of monitoring an area as large the Dutch Sector of the North Sea, is the question of congruous variations in the density of a species over areas larger than single stations. Such variations were resolved with a two-way ANOVA for the stationgroups (clusters), distinguished in 1991. Because this analysis requires an equal number of observations for every station, it could only be applied to data from the period 1991-1993. As our statements should apply to the whole surface area covered by the stationgroup, with the stations being 'random' locations representative for the area, and not to a set of fixed geographical points, we have chosen for a MIXED model ANOVA instead of a FIXED model. This implies that the station-time interaction is regarded as the error source over which the effect of time is measured (see Sokal & Rohl, 1981; van der Meer, 1994 for a discussion). The two-way ANOVA was applied to the density data of each species separately in each of the four clusters. The outcome of the ANOVA in Table 3 shows that no congruent density variations were found for any of the species in the four clusters during the period 1991-1993.

The regression analysis with species abundances in clusters yielded only one species with a significant trend during the period 1991-1993, namely the ophiuroid *Amphiura filiformis* in the first Oyster Ground cluster (Table 3), but incorporation of earlier data for this cluster (i.e. 1990 observation for TS100) removed this trend again. Adding earlier data to the other clusters exposed new trends for the Polychaetes *Lanice conchilega* in the coastal cluster and for *Scoloplos armiger* in the second Oyster Ground cluster. Because these two trends are caused by observations from one particular year at a single station (1986 data from SM1 for *Lanice* and 1986 data from SM30 for *Scoloplos*), the relevance of the trends can be questioned.

4.5. Variations in Community and Phylum attributes

The following sections describe the variations and trends in general attributes of the whole community and of the principal phyla. The attributes comprise diversity (Shannon-Wiener, Simpson), species number, abundance, biomass, and production. The production estimates in this case are derived from the abundance and biomass data (see section 3.3). Diversity is only given for the total assemblage. The number of Echinoderm species and of miscellaneous Phyla were not taken into consideration, because values for Echinoderm species are all less than 3 and miscellaneous Phyla were not identified to the species level.

4.5.1. Diversity, density and biomass at single stations

Table 4 shows the occurrence of significant fluctuations (one-way ANOVA) in community attributes during the period 1991-1993 for every individual station. The annual means plus comparison intervals have been plotted in Figs. 5*a-r*. Significant trends have been marked by < and > symbols in Table 4 while their geographic distribution is shown in Figs. 6*a-e*.

Among the attributes referring to the whole community, (diversity, total density and biomass), total density had the highest number of significant variations with the two diversity indices (Shannon-Wiener, Simpson) and total speciesnumber second in rank. It should, however, be stressed that these attributes are not entirely independent. For instance, an increase of the total number of species with a constant number of individuals, may lead to a change in one of the diversity measures. Relatively few significant entries (i.e. significant differences or trends) were found for total biomass. Among the attributes of the separate phyla, those pertaining to Polychaetes invariably have the highest number of significant entries in Table 4. This is probably because the majority of the species, and quite often individuals too, belong to this phylum.

The distribution of entries over individual stations shows that there are substantial differences in the stability of the local assemblages over the 3 year period. Stations with a markedly high number of entries are SM37 at the Dogger Bank, and VD1 plus VD3 in the Voordelta. Relatively little variation, on the other hand, was found at the stations along the Rottum transect (R3, R50 and R70) and the least of all at station SM20 on the southern edge of the Oyster Ground (see Fig. 1). Although little variation was found in the case of the Rottum stations, other nearby stations sometimes differ greatly in stability, e.g. VD2 and VD3. Taking the cluster division into account, both "stable" and "instable" stations are found to occur in the coastal as well as in the offshore cluster.

Re-analyzing the data for the 11 stations with four datapoints (observations from 1986/90 included), led in all but three stations (N2, N10 and N50) to a drastic increase in significant entries (not shown in Table 4). This increase was most pronounced at station RHC4, where 10 new entries appeared, but also stations TS4, SM1, and SM20 gained a large number of new entries. In the latter case these were all decreasing trends. Station SM37 remained the one with the highest incidence of significant entries. When the 1991-1993 trends at the 11 stations (Table 4) were compared with the ones obtained with the expanded dataset this showed that about half of the cases that showed a trend over 1991-1993 also shows a trend over the extended time interval (marked by a < < or > > in Table 4). In the other 50 percent of the cases no trend was found when looking at the longer dataset.

4.5.2. Diversity, density and biomass in subregions

Significant variations at the cluster level (MIXED two-way ANOVA) over the period 1991-1993 were sparse and limited to diversity in the coastal stationgroup and total biomass plus density of miscellaneous Phyla in the second Oyster Ground stationgroup (Table 4). Significant trends within clusters were equally rare and mainly restricted to biomass attributes: miscellaneous and Polychaete biomass in first Oyster Ground cluster, Crustacean biomass in second Oyster Ground cluster and number of Polychaete species in the coastal stationgroup. No significant trends were found for any of the attributes in the offshore area. This was not altered when earlier data were included in the analysis. After inclusion of data from 1986/90, few new trends appeared in the other three clusters (see Table 4), but none of the trends from the 1991-1993 period was found to be also present over the extended time interval.

4.5.3. Production at single stations

Production estimates could not be calculated for the data from 1986 (ICES-NSBS) since biomass was pooled on the phylum level. Table 5 combines the outcome of the regression analysis and ANOVA on production estimates for the period 1991-1993. Figs. 7*a-e* show the annual means plus comparison limits of the production values for the separate stations. The distribution of trends in total production are depicted in Fig. 8. Because Echinoderm production was derived from biomass by multiplying with an average P/B ratio of 0.4 (see Cramer et al., 1991 for *Echinocardium cordatum*; Sköld et al., 1994 for *Amphiura filiformis),* results for biomass in Table 4 and production in Table 5 are the same.

In general, results for production in Table 5 and for biomass in Table 4 are almost alike. In contrast to total biomass, only station VD3 exhibits a clearly significant trend in total production. The increasing production at this station is due to the growing weight of the resident *Ensis directus* population. Total production at the other two stations, where a trend in total biomass was found over the period 1991-1993, viz. SM58 and N70, displayed trends that were just beyond the edge of significance. Appending the 1990 data for stations TS100, TS4, N2, N10 and N50, resulted in a rise in significant entries for all stations in question, with the most prominent rise at station TS4 (result not shown). The new entries included a significant trend in total production at all the five stations. With exception of N50, where total production declined, trends, what total production concerns, increased. Comparing regression results from the 1991-1993 period with those from the 1990-1993 period showed that two phyla had a trend in production which continued to be significant over the extended time interval: Crustaceans at TS100 and miscellaneous Phyla at N10.

4.5.4. Production in subregions

The results of a two-way MIXED ANOVA and regression analysis on the production estimates in the four subregions are shown in Table 5.

Crustacean production in the second Oyster Ground Group was the only case where we recorded both a significant variation and trend at the cluster level, over the period 1991-1993, although we did not find any significant alteration on the station level. Significant trends were furthermore found for production of Polychaetes and Miscellaneous Phyla in the first Oyster Ground cluster. Including the 1990 data for five stations did not add any new entries, but instead resulted in the loss of the trend for Polychaetes in the first Oyster Ground cluster; the trend in Miscellaneous production remained significant.

5. DISCUSSION

Instead of a lengthy analysis of the fate of all 290 species that were found in the area, during the period 1986-1993, we have opted in this report for the analysis of species and community attributes that we considered relevant in view of the possible sources of anthropogenic disturbance of the benthic habitat of the Dutch Sector of the North Sea viz. fisheries and eutrophication. It is conceivable and partly documented as well, that both types of perturbation lead to gross changes in the community which can also be detected at higher taxonomic levels (Warwick & Clarke, 1993 and references therein). In the Skagerrak and Kattegat area, for instance, inhabited by an *Amphiura*-community similar to the Oyster Grounds, eutrophication has led to an increased biomass and density of Polychaetes and Ophiuroids over the past decades (Pearson et al., 1985, Josefson, 1990). Experimental beamtrawling, on the other hand, led to a concomitant reduction of several mollusc species and tubicolous Polychaetes (Bergman et al., 1990). It is unlikely that changes in the degree of eutrophication in the subtidal Dutch Sector of the North Sea can be revealed by a dataserie as short as the present one. The studies of Beukema (1991) on a Dutch tidal flat where there is presumably even a tighter coupling between the benthic and pelagic biota, illustrate that long-term monitoring (> 10 yr) is needed in order find clear relations between variations in algal standing stock and zoobenthos. However, also over a short time scale enhanced algal biomasses caused by eutrophication may give rise to measurable effects on the benthic fauna by way of O_2 deficiencies in the bottom water. Low O_2-saturation has immediate and dramatic consequenses for the whole community and some phyla in particular (Echinodermata, pers. obs.) like have been observed in the German Bight (Dethlefsen & von Westernhagen, 1983). Thus with the appropriate sensitive species and general discriptors of the community, it should be possible to detect the drastic changes invoked by our two potential sources of perturbation in the Dutch Sector of the North

Sea.

By means of the DECORANA ordination in Fig. 2 we have depicted the combined information about changes in species density in the period 1986-1993. This showed that the gross differences between the species assemblages in terms of species composition and density remained constant during the period of 1991-1993. The earlier data that were included, fitted generally well with the position of the 1991-1993 points, meaning that also over longer periods the composition of the species assemblages remained fairly stable. A more detailed inspection of Fig. 2 clearly shows that the assemblage of some stations is more variable than of other stations and, moreover, that dissimilarities were sometimes reduced or enhanced in time. Stations with an intermediate datapoint (i.e. 1992) as outlier are R3, N30 and R50. The contrast between the 1991 and 1992 data from these three stations was already noted in the 1992 report and was attributed to sampling variance. The fact that in the 1993 points for the three stations have not diverged any further from the points belonging to previous years but instead approached the initial 1991 points, strengthens our conclusion that the deviating 1992 observations were due to sampling variance. Stations of which the assemblage seems to move away from the earliest datapoint are SM1 and VD3. For station SM1 this change is entirely due to the steady decrease in dominance of *Spisula subtruncata*. Natural mortality in combination with the lack of recruits in the resident population of *Spisula* has resulted in a gradual reduction of their numbers.

At first sight there may seem to be a discrepancy between the closeness of datapoints of individual stations in the DECORANA-plot and the number of significant variations we found in Tables 2 and 3. The latter variations, however, comprise relative changes of attributes within stations. The DECORANA ordination, on the other hand, also takes the differences between stations into account and thus offers a more comprehensive insight into the 'significance' of shifts in species densities.

The analysis of changes in density of selected species, yielded few significant results when areas larger than single stations were considered. None of the species we selected showed a coherent significant change in any of the subregions during the period 1991-1993 while only one species (*Amphiura filiformis*) showed a trend in a subregion, the first Oyster Ground group. Appending these data to observations prior to 1991 yielded in two new species with trends in subregions, *Lanice conchilega* in the coastal cluster and *Scoloplos armiger* in the second Oyster Ground group. Since the other tube-dwelling Polychaete *Spiophanes bombyx* did not display a trend in the coastal cluster, the one of *Lanice* can hardly be ascribed to an event affecting tubicolous Polychaetes such as fishery (see Bergman et al., 1990).

This result implies that the majority of the trends in species density, that we observed at individual stations, must be due to a local (station) effect. Including the 1990-observations from TS100, TS4, N2, N10, N50 in the data, resulted into a rise in the number of entries in Table 3 for these 5 stations. Taking the differences and ranking of the annual means into account (Figs. 3*a-n*) it can be seen that the majority of these new trends were generated by 1990 observations which were widely different from the proceeding ones. In cases where 1986 data led to new significant regressions, there could have been a trend in the intermediate period but this was not continued in the period 1991-1993. We could find only four species-station combinations where a distinct 1991-1993 trend continues throughout four years of observations, namely *Spiophanes bombyx* at SM37, *Amphiura filiformis* at RHC4, *Tellina fabula* at SM1, and *Nephtys cirrosa* at N2. All other combinations with significant regressions over both the period 1991-1993 and 1986/1990-1993, could all be ascribed to large changes in the last (two) sampling year(s) as can be verified by inspection of the annual means in Figs. 3*a-n*.

Also community attributes in Table 4 showed little change over the subregions during 1991-1993. For the offshore cluster, for instance, we did not find any change or trend. A significant trend in combination with significant differences among the means was only recorded for Polychaete biomass in the first Oyster Ground cluster. Furthermore, significant trends without the means being different were found for the miscellaneous biomass in the first Oyster Ground cluster and the number of Polychaete species at the coastal stations. Noticeably, in none of the subregions there is a trend in either total biomass, total number of species or total density in 1991-1993. Extending the time series with earlier observations did not raise the number of trends. Striking is the absence of trends over the period 1986-1993 in the second Oyster Ground cluster, though all stations were sampled in 1986. The single case in which a trend extended backwards is the number of Polychaete species in the coastal cluster, although the trend disappeared when the one 1986 observation was included. In view of the possible effects of eutrophication it is noteworthy to emphasize the absence of trends in total biomass in all, and of Polychaete biomass in three of the subregions. Attributing the increase of Polychaete biomass in the first Oyster Ground cluster (Table 4) to eutrophication would be in contrast with the lack of trends in *Amphiura filiformis* (Table 3) since both quantities increased simultaneously with the eutrophication of the Skagerrak area in the 1970's and 1980's (Josefson, 1990).

At the individual stations we found quite a lot of significant variations and trends, but relatively few pertaining to biomass attributes. Since we are dealing with attributes of a more robust character than species densities, concomitant trends in more than one of the principal attributes (Shannon-Wiener/Simpson, total species number, density, or biomass), could point at more fundamental changes in the local community during the period 1991-1993. Concurring decreases or increases in both species number and total density were found at the following stations: META2, TS30, VD1, N30, N50, N70, and SM37. A concomitant trend in total biomass was only observed at station N70 (Table 4). Given the fact that a detoriation of the benthic community due to pollution, O_2-deficiency or disturbance generally leads to a reduction of the species number often accompanied by a decrease in total abundance (e.g. Rachor, 1982; Kröncke et al., 1992), we marked simultaneous decreases in both attributes as being indicative for a negative development of the benthic fauna and simultaneous increases as a positive development. According to these criteria, the changes in the community at stations META2, N50 and N70 are negative and those at VD1, N30 and SM37 positive. The situation at TS30 is more complex because the number of species increases while the number of individuals drops.

Including the earlier observations reinforced our conclusion for station SM37, i.e. the 1986 data generally fitted well into the increasing trends over the period 1991-1993 (see Figs. 5*a-r*). Appending the 1990 data to station N50, in contrast, eliminated the trends that were found for the period 1991-1993. For the other stations of the set with supposedly negative or positive changes, there are no supplementary data. The loss of trends at station N50 because of one additional datapoint does not only evoke questions about the importance of 1991-1993 trends in this case, but also stresses that any statement about trends, made on the basis of few datapoints, should be treated with caution. Including the earlier data in the regression analysis resulted in three more stations with coinciding trends in important community attributes, namely TS100, RHC4 and SM20. The changes at the first two stations can be designated as positive and at the last station as negative. It can be seen in Figs 5*a-r*, that the new trends at these stations are mainly due to highly dissimilar values for the earliest observations (1990 or 1986). At TS100, for instance, clear-cut trends over the interval 1990-1993 are limited to the Shannon-Wiener diversity index and perhaps biomass of Polychaetes and Miscellaneous Phyla. The twofold increase in total density and speciesnumber within one settlement season at this station, puts some questions to reliability of the early data. The more as we did not find large numbers of recruits in 1991. However, at RHC4 and SM20 where the time gap between the first observation (1986) and the proceeding ones (1991-1993) is large, it is hard to value the trends we found for this period. It is very well possible that the differences between the first and last three observations are part of a trend-like increase, that leveled off in the last three years. It could, on the other hand, also have been caused by differences in treatment of the samples.

In an attempt to integrate information on changes in numbers and biomass into one measure, we have calculated estimates for production of individual phyla and the total community (Table 5). Another reason for incorporating production is that it is the only functional aspect of a community that can be approximated with the present data. Because the phyla are differentially weighted in total production, we expected the production estimates to provide supplementary information over either total biomass or abundance. However, significant trends in total production coincided with those in total biomass (VD3), so little extra information was gained. The same holds for production by the individual phyla. The explanation for the congruent variations of biomass and production of phyla is that an increase of biomass has more effect on production (see formula p. 10) than a similar increase in abundance. With total production, the effect of weighing is apparently small compared to the differences in biomass of the phyla.

6. SUMMARY AND CONCLUSIONS

The present report includes an overview of the data from a third survey of the macrobenthic fauna in the Dutch Sector of the North Sea, made in May 1993. On the basis of these data, supplemented with those from three previous BIOMON surveys (1990-1992) and the data from the ICES North Sea Benthos Survey (1986), an analysis has been made of the year to year variation in density of selected species and of principal attributes of the community and phyla over the respective time-intervals. Significant differences and trends were determined for individual stations as well as for four groups of stations, representing faunistic subregions of the Dutch Sector. The selected species are ones that have a sufficiently high abundance and wide distribution to allow statistical statements and which ,moreover, are either characteristic for a specific subregion or sensitive to likely sources of anthropogenic disturbance (e.g. fishery). The attributes that we have tested are the two diversity measures as well as species number, abundance and biomass of the total community and the phyla.

The analysis of trends and variations in species densities in stationgroups (subregions) revealed no significant differences at all and very few significant trends. The decrease in density of the Polychaete *Lanice conchilega* in the coastal cluster only holds for the period 1986-1993; no trend was apparent in the data from 1991-1993. The decreasing trend of the brittlestar *Amphiura filifomis* abundance in the first Oyster Ground cluster applies only the period 1991-1993, it does not continue backwards to 1990. At the individual stations trends and variations in species densities were more numerous and even more so when the data from 1991-1993 was appended to earlier data. Furthermore we did not find any concomitant decrease in species-types that is sensitive to physical disturbance (bivalves, tubicolous Polychaetes).

Significant variations and trends in values for the principal community attributes in subregions were equally sparse. Possibly because of its heterogeneity, the offshore stationgroup yielded no significant trend or change at all. Significant variations, though not trends, in the period 1991-1993 were recorded for the two diversity indices in the coastal cluster, and total biomass and density of miscellaneous species in the second Oyster Ground cluster. The trends that we found for the period 1991-1993 did not apply to any measure of the total community, only to attributes of separate phyla, viz. biomass of Polychaetes and miscellaneous species in the first Oyster Ground cluster, Crustacean biomass in the second Oyster Ground cluster and number of Polychaete species in the coastal cluster. The latter trend was also signficant over the time-interval 1990-1993, but none of the trends remained significant when the dataset was fully expanded with earlier observations. Important to note is the absence of trends in total biomass in the subregions since biomass increase is usually linked to organic enrichment.

The community and phyla attributes displayed more variation and trends at the separate stations, but relatively few pertaining to total biomass. Concurring trends in several of the important community attributes (total number of species, density, biomass) were found at stations META2, N70, TS30, N30, VD1 and SM37. While the first two stations endured a negative change, this change was positive at the last three stations. At TS30 an increase in the number of species was accompanied by a decrease in total density. Addition of earlier observations (1986 or 1990) revealed three more stations with coinciding trends in species number and total density, viz. TS100, SM20 and RHC4. While the changes at TS100 are questionable, the positive and negative changes at RHC4 resp. SM20 could have been part of a trend like increase in the intermediate period (1986-1991).

On basis of these findings we conclude that during the interval 1991-1993 no major or negative changes have taken place over larger subareas of the North Sea. Including the earlier data does not alter our conclusion for subregions. Although we found a lot of variation at the individual stations, no evidence was found for a drastic physical disturbance at any of them. Hence, the apparently negative trends that we recorded for the two stations N70 and META2 must be due to some other (natural?) cause. The same holds for the stations where a positive trend in the major community attributes was observed.

7. ACKNOWLEDGEMENTS

The authors wish to thank the captain, crew and personnel of Rijkswaterstaat on board of the R.V. 'Holland' for their assistance during the cruise. We are grateful to Jaap van der Meer for his help in the statistical analysis of the data.

8. REFERENCES

Alphen, J.S.L.J. van, M.A. Damoiseaux, 1989. A geomorpholoical map of the Dutch shoreface and adjacent part of the continental shelf. Geologie en Mijnbouw, 68(4): 433-443

Bergman, M.J.N., M. Fonds, M. Hup, W. Lewis, P. van der Puyl, A. Stam, D. den Duyl, 1990. Direct effects of beam trawl fishing on benthic fauna in the North Sea - a pilot study. BEON-Rapport 8: 33-57.

Beukema, J.J., 1991. Changes in composition of bottom fauna of a tidal flat area during a period of eutrophication. Mar. Biol., 111: 293-301.

Brey, T., 1990, Estimating productivity of macrobenthic invertebrates from biomass and mean individual weight. Meeresforschung, 32(4): 329-343.

Buchanan, J.B., J.J. Moore, 1986. A broad review of variability and persistence in the Northumberland benthic fauna-1971-85. J. Mar. Biol. Ass. U.K., 66: 641-657.

Cramer, A. G.C.A. Duineveld, M.I. Jenness, 1991. Observations on spatial distribution, metabolism and feeding strategy of *Echinocardium cordatum* (Pennant) (Echinodermata) and the implications for its energy budget. Phd. Thesis, University of Amsterdam: 63-78.

Dethlefsen, V., H. von Westernhagen, 1983. Oxygen deficiency and effects on bottom fauna in the eastern German Bight 1982. Meeresforsch., 30: 42-53.

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

Duineveld, G.C.A., P.A.W.J. de Wilde, A. Kok, 1990. A synopsis of the macrobenthic assemblages and benthic ETS activity in the Dutch Sector of the North Sea. Neth. J. Sea Res., 26(1): 125-138.

Duineveld, G.C.A., 1992. The macrobenthic fauna in the Dutch Sector of the North Sea in 1991. NIOZ-Rapport 1992-6: 1-19.

Duineveld, G.C.A., J.J.M. Belgers, 1993. The macrobenthic fauna in the Dutch Sector of the North Sea in 1992. NIOZ-Rapport 1991-11: 1-38.

Duineveld, G.C.A., H.J. Witte, 1987. Report on an intercalibration exercise on methods for determining ashfree dry weight of macrozoobenthos. ICES CM 1987/L:39: 1-6.

Essink, K., 1991. Bemonstering an analyse van macroscopische bodemfauna van de Voordelta en de Noordzee (Nederlands Continentaal Plat). Getijdewateren Standaard Voorschrift, Rijkswaterstaat Dienst Getijdewateren: 1-9.

Essink, K., J.J. Beukema, 1991. Long-term changes in intertidal and shallow-subtidal sedimentary zoobenthos. Review of work carried out within the framework of COST 647. In: B. F. Keegan (Ed.), Space and time series data analysis in coastal benthic ecology. Commission of the European Communities Directorate for Science, Research and Development Environment Research Programme: 43-64.

Heip, C., D. Basford, J.A. Craeymeersch, J.M. Dewarumez, J. Dörjes, P. de Wilde, G. Duineveld, A. Eleftheriou, P.M.J. Herman, U. Niermann, P. Kingston, A. Künitzer, E. Rachor, H. Rumohr, K. Soetaert, and T. Soltwedel, 1992. Trends in biomass, density and diversity of North Sea Macrofauna. ICES J. mar. Sci, 49: 13-22.

Hill, M.O., 1973. Diversity and evenness: a unifying notation and its consequences. Ecology, 54: 427-432.

Hill, M.O., 1979. DECORANA - a FORTRAN program for detrended correspondence analysis and reciprocal averaging. Ithaca: Cornell University, New York: 1-52.

Holtmann, S.E., Y.C.M. van Scheppingen, A. Groenewold, 1990. Biomonitoring van het zoobenthos in de Zuidelijke Noordzee Voorjaar 1990. Rijkswaterstaat Rapport Directie Noordzee: 1-15.

Holtmann, S.E., A. Groenewold, 1992. Distribution of the zoobenthos on the Dutch Continental Shelf: the Oyster Ground, Frisian Front, Vieland Ground and Terschelling Bank (1991). NIOZ-Rapport 1992-8: 1-129.

Holtmann, S.E., A. Groenewold, 1994. Distribution of the zoobenthos on the Dutch Continental Shelf: the western Frisian Front, Brown Bank and Broad Fourteens (1992/1993). NIOZ-Rapport 1994-1: 1-136.

Huys, R., G. De Smet, 1992. Het Meiobenthos van het Nederlands Continentaal Plat voorjaar 1991. Rapport Nederlands Instituut voor Oecologisch Onderzoek, Yerseke, 57pp.

Josefson, A.B., 1990. Increase of benthic biomass in the Skagerrak-Kattegat during the 1970s and 1980s - effects of organic enrichment. Mar. Ecol. Prog. Ser., 66: 117-130.

Kröncke, I., G.C.A. Duineveld, S. Raak, E. Rachor, R. Daan, 1992. Effects of a former discharge of drill cuttings on the macrofauna community. Mar. Ecol. Prog. Ser., 91: 277-287.

Künitzer, A., D. Basford, J.A. Craeymeersch, J.M. Dewarumez, J. Dörjes, G.C.A. Duineveld, A. Eleftheriou, C. Heip, P. Herman, P. Kingston, U. Niermann, E. Rachor, H. Rumohr and P.A.W.J. de Wilde, 1992. The benthic infauna of the North Sea: species distribution and assemblages. ICES J. mar. Sci, 49: 127-143.

Meer, J. van der, 1994. Sampling design of monitoring programs for marine benthos. A comparison between the use of fixed vs. randomly selected stations. in prep.

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

Pearson, T.H., A.B. Josefson, R. Rosenberg, 1985. Petersen's benthic stations revisited. I.Is the Kattegatt becoming eutrophic?. J. Exp. Mar. Biol. Ecol., 92: 157-206.

Rachor, E., 1982. Indikatorarten für Umweltbelastungen im Meer. Dechenia-Beihefte, 26: 128-137.

Rumohr, H., T. Brey, S. Ankar, 1987. A compilation of biometric conversion factors for benthic invertebrates in the Baltic Sea. Baltic Marine Biology Publ.,9: 1-56.

Sköld, M., L. Loo, R. Rosenberg, 1994. Production, dynamics and demography of an *Amphiura filiformis* population. Mar. Ecol. Prog. Ser., 103: 81-90.

Sokal, R.R., F.J. Rohlf, 1981. Biometry. Freeman & Co., San Francisco: 1-859.
Warwick, R.M., K.R. Clarke, 1993. Comparing the severity of disturbance: a meta-analysis of marine macrobenthic community data. Mar. Ecol. Prog. Ser., 92: 221-231.

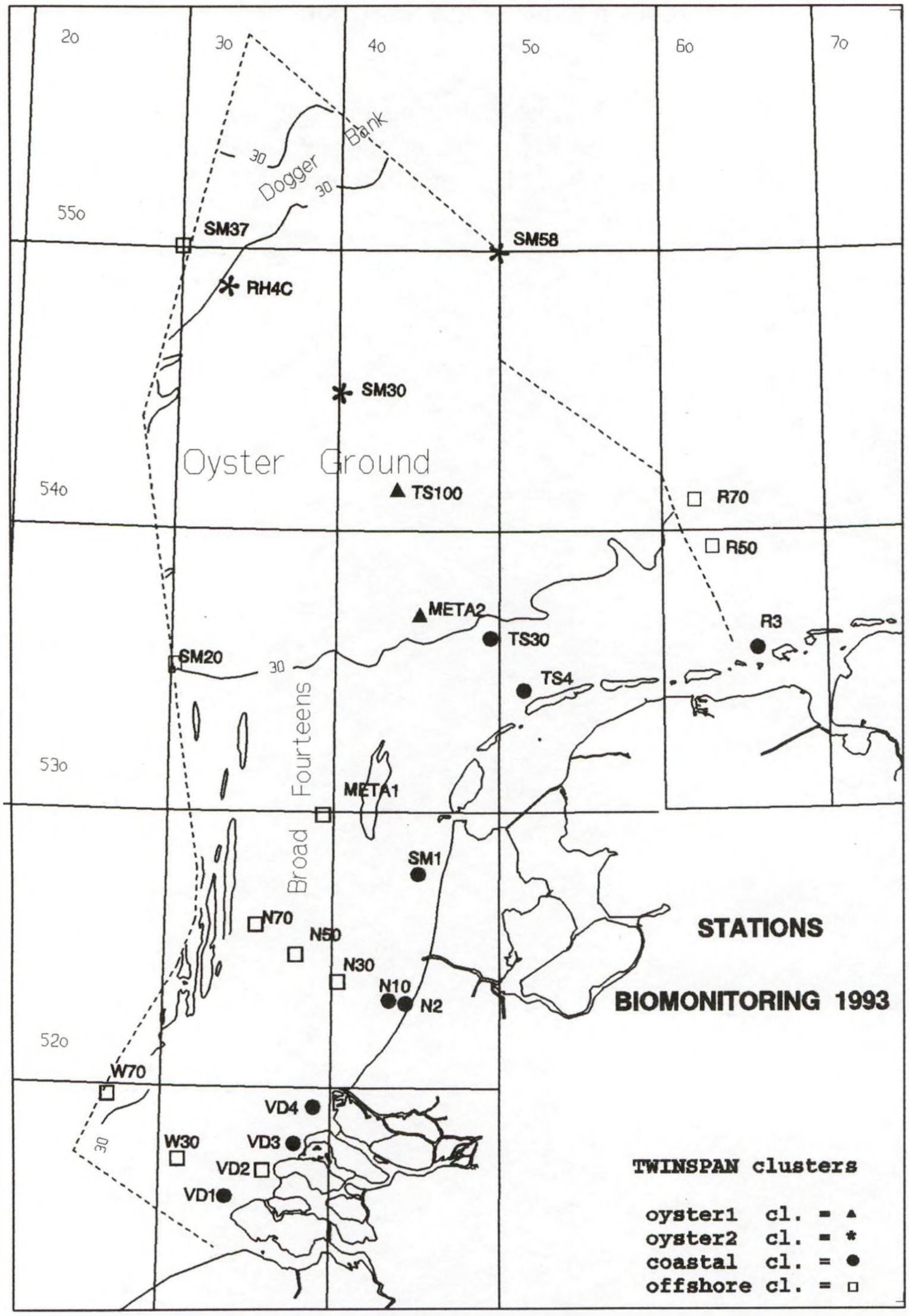

Fig. 1. Locations of the sampling stations which have been visited during the survey's in 1991, 1992 and 1993. The stations TS4, TS100, N2, N10 and N50 were previously sampled in 1990. The stations SM1, SM20, SM30, SM37, SM58 and RHC4 have been previously sampled during the ICES-NSBS in 1986. The various symbols in the figure indicate the 4 clusters, distinguished by a TWINSPAN clustering of data, obtained in 1991.

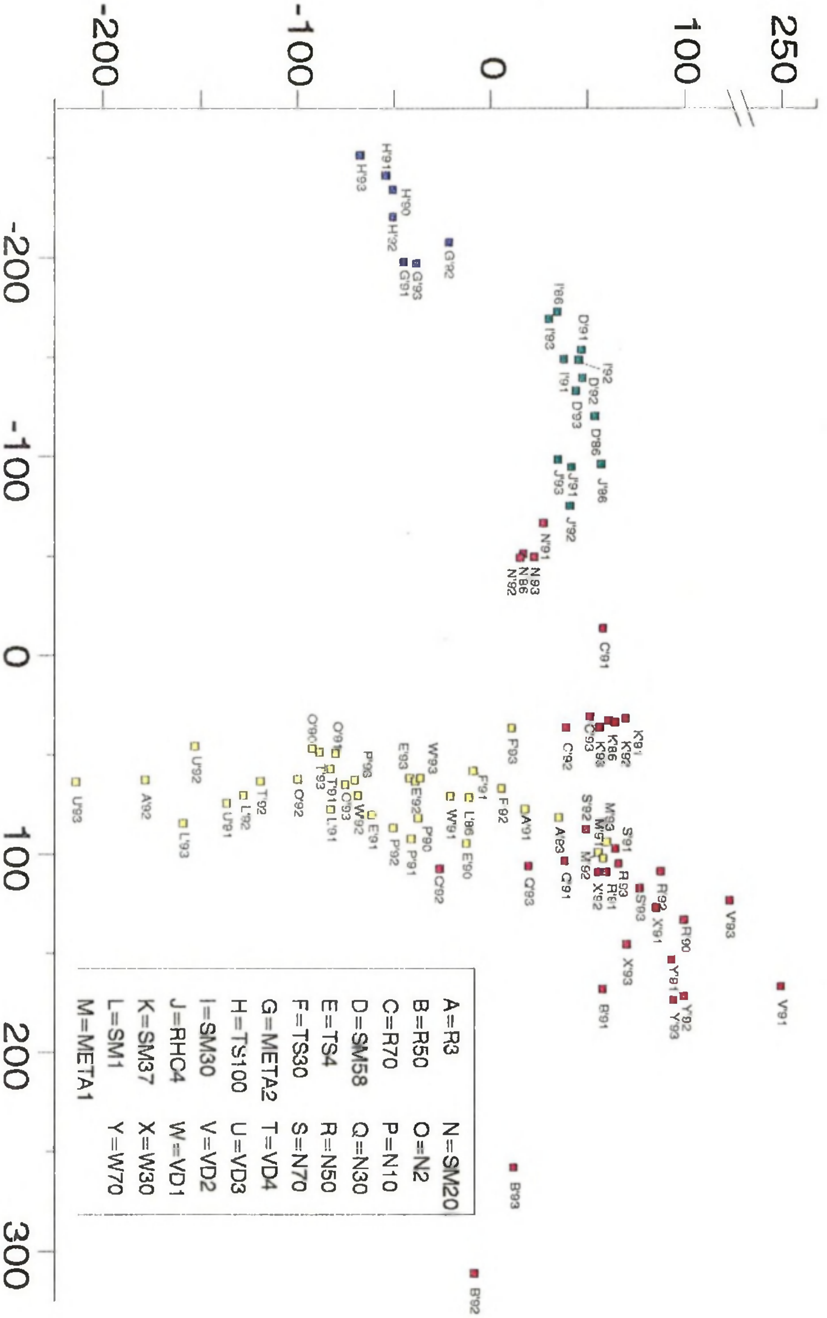

Fig.2. DECORANA ordination of the combined datasets from: -1- monitoring project (1991 - 1993; 25 stations), -2- 1990 monitoring survey(stations TS4, TS100, N2, N10, N50) and -3- ICES-NSBS (1986; stations SM1, SM20, SM30, SM37, SM58 and RHC4). Stationnames have been replaced by lettercodes (see inset) which have been appended with the year of observation.

Table 1. Median grainsize (MED.; in μm.) and percentage mud (MUD; particles < 63 μm.) of the sediment at the sampling stations in spring 1991, 1992 and 1993. Stations are arranged according to the TWINSPAN division of 1991. For clusternames, see rightmost column. A - denotes a missing value.

STATION	MED. (µm.)			% MUD			CLUS-TERS
	1991	1992	1993	1991	1992	1993	
META	105	105	100	21.3	19.7	20.6	OYSTER 1
TS100	93	94	92	17.0	14.4	16.6	OYSTER 1
SM30	112	113	107	7.9	9.3	10.9	OYSTER 2
RHC4	142	147	143	6.0	6.2	5.7	OYSTER 2
SM58	148	151	147	7.3	7.2	6.9	OYSTER 2
R3	161	144	163	3.0	10.4	2.3	COASTAL
TS4	210	215	214	0.5	1.1	1.5	COASTAL
TS30	215	215	213	0.4	2.1	0.7	COASTAL
SM1	226	226	225	1.9	2.5	0.7	COASTAL
N2	218	252	240	5.0	3.9	3.4	COASTAL
N10	327	326	301	1.0	2.0	2.2	COASTAL
VD4	202	205	193	2.6	3.3	2.4	COASTAL
VD3	-	256	-	-	1.9	-	COASTAL
VD1	255	264	252	0.5	1.7	1.1	COASTAL
R50	357	316	352	0.5	2.6	0.9	OFFSHORE
R70	215	-	216	2.2	-	3.0	OFFSHORE
META1	249	246	251	0.6	1.8	0.6	OFFSHORE
SM20	138	134	134	10.5	9.0	7.5	OFFSHORE
N30	334	320	320	0.9	1.6	0.7	OFFSHORE
N50	277	-	280	0.4	-	0.9	OFFSHORE
N70	282	293	285	0.5	1.1	0.0	OFFSHORE
VD2	-	265	-	-	1.7	-	OFFSHORE
W30	328	308	348	0.4	2.7	0.8	OFFSHORE
W70	392	411	476	0.4	2.5	0.8	OFFSHORE
SM37	188	193	192	1.8	2.5	1.2	OFFSHORE

Table 2. Mean values of abiotic and biotic parameters in 1993 for each of the 4 TWINSPAN clusters distinguished in 1991. The values in each second column of a cluster(C.V.), are the coefficients of variation (=s.d./mean).

TWINSPAN-CLUSTERS	OYSTER 1		OYSTER 2		COASTAL		OFFSHORE	
No. of stations	2	C.V.	3	C.V.	9	C.V.	11	C.V.
Median Grainsize (µm)	6.31	0.06	127.49	0.22	222.50	0.19	412.29	0.22
Perc. Mud	18.56	0.15	8.89	0.32	1.71	0.55	0.83	0.02
Depth (m)	44.00	0.16	43.60	0.06	12.20	0.10	35.60	0.33
No. species per core	29.90	0.25	30.00	0.31	15.70	0.34	18.20	0.49
Shannon- Wiener diversity	2.60	0.20	1.97	0.17	1.98	0.25	2.25	0.22
Simpson's dominance	0.13	0.60	0.28	0.30	0.22	0.74	0.15	0.60
No. individuals.m-²								
Crustaceans	382.00	0.34	330.00	0.71	471.00	1.36	309.00	1.67
Echinoderms	631.00	0.79	2260.00	0.63	35.00	1.05	78.00	1.20
Molluscs	748.00	0.64	1174.00	0.26	735.00	1.29	90.00	1.30
Polychaetes	528.00	0.38	919.00	0.71	717.00	0.73	761.00	0.83
Miscellaneous	119.00	0.89	65.00	0.80	75.00	1.01	136.00	2.00
TOTAL	2407.00	0.41	4748.00	0.41	2033.00	0.79	1374.00	0.93
Biomass (g. AFDW.m-²)								
Crustaceans	20.00	2.11	1.90	1.19	0.20	1.29	0.60	2.22
Echinoderms	4.80	1.22	16.80	0.96	10.80	1.48	3.60	1.93
Molluscs	1.00	2.26	1.70	1.84	72.80	1.80	0.80	2.76
Polychaetes	19.90	0.51	1.20	0.78	4.80	1.28	2.20	1.14
Miscellaneous	1.80	0.67	0.20	2.56	1.00	2.64	0.40	2.01
TOTAL	47.60	1.00	21.80	0.82	89.60	1.47	7.60	1.17

Table 3. Overview of differences and trends in mean density of selected species. Results for single stations pertain to the period 1991-1993, those for station groups also for extended periods of time(indicated in the second column). ░ indicates a significant difference among the mean densities of the studied years(c.f. Fig. 3a-n). The symbols > and < respectively stand for an upward or downward trend in this period(c.g. Fig. 4a-d). Double arrows(> >) indicate that the trend remains significant over the extended time period, viz. 1990-1993 for stations TS4, TS100, N2, N10, N50, and 1986-1993 for stations SM30, RHC4, SM58, SM1, SM20 and SM37.

STATION	PERIOD	MAGEPAPI	TELLFABU	UROTPOSE	ECHIPUSI	NEPHCIRR	SPISSUBT	SPIOBOMB	LANICONC	MYSEBIDE	AMPHFILI	CALLSUBT	BATHEELEG	NEPHHOMB	SCOLARMI	CLUSTER
META2	91-93															OYSTER 1
TS100	91-93											>>				
oyster1 cluster	90-93															
oyster1 cluster	91-93										<					
SM30	91-93	<													<<	OYSTER 2
RHC4	91-93								>>	<	>>			>>		
SM58	91-93										<					
oyster2 cluster	86-93														<	
oyster2 cluster	91-93															
R3	91-93			<												COASTAL
TS4	91-93	>>	>>					<<	<<					>>		
TS30	91-93			>				<	<	>					>	
SM1	91-93		<<			<								>		
N2	91-93			>>		>>	<<									
N10	91-93															
VD4	91-93		<	<		<	<	>						>		
VD3	91-93			<		<			<					>		
VD1	91-93	<		<		>		>								
coastal cluster	86-93								<							
coastal cluster	90-93															
coastal cluster	91-93															
R50	91-93					<									<	OFFSHORE
R70	91-93				>								>			
META1	91-93	<			<			<								
SM20	91-93														>>	
N30	91-93					>		>								
N50	91-93					<										
N70	91-93							<							<	
VD2	91-93															
W30	91-93					>		>								
W70	91-93								<							
SM37	91-93							>>	>>							
offshore cluster	86-93															
offshore cluster	90-93															
offshore cluster	91-93															

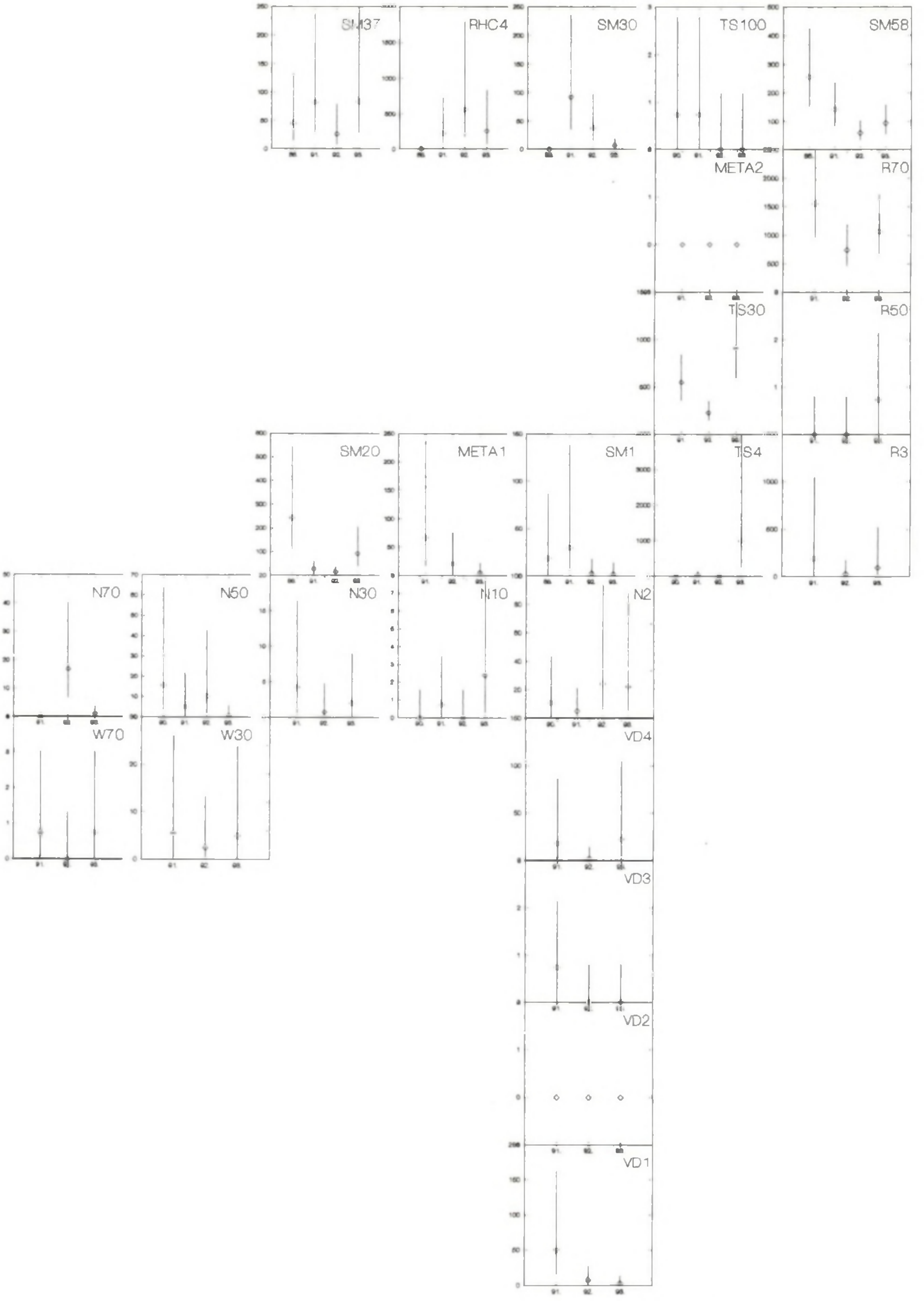

Fig. 3a. Comparison plots of *Magelona papillicornis* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means(See pag. 10 for an explanation of comparison limits).

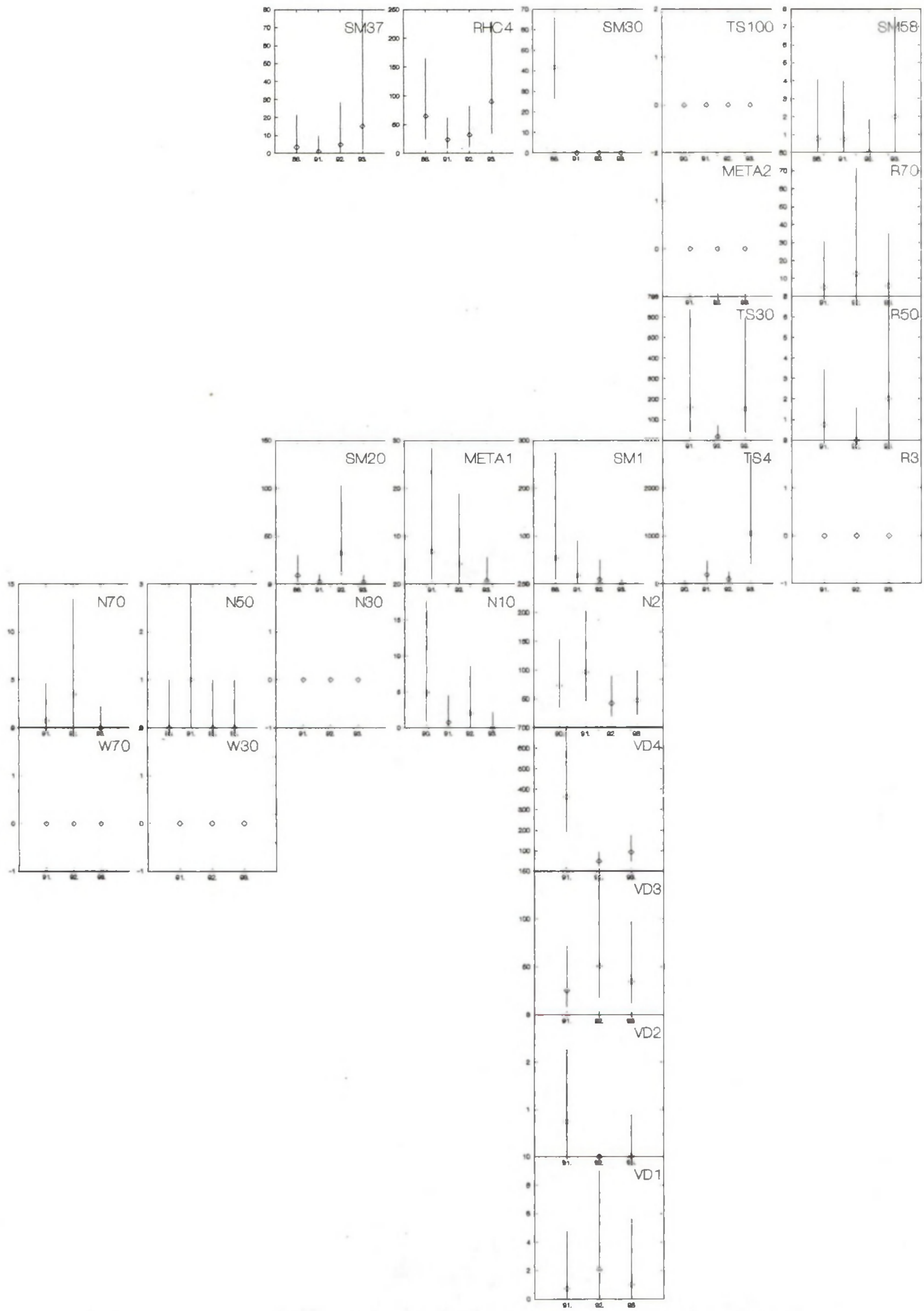

Fig. 3b. Comparison plots of *Tellina fabula* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

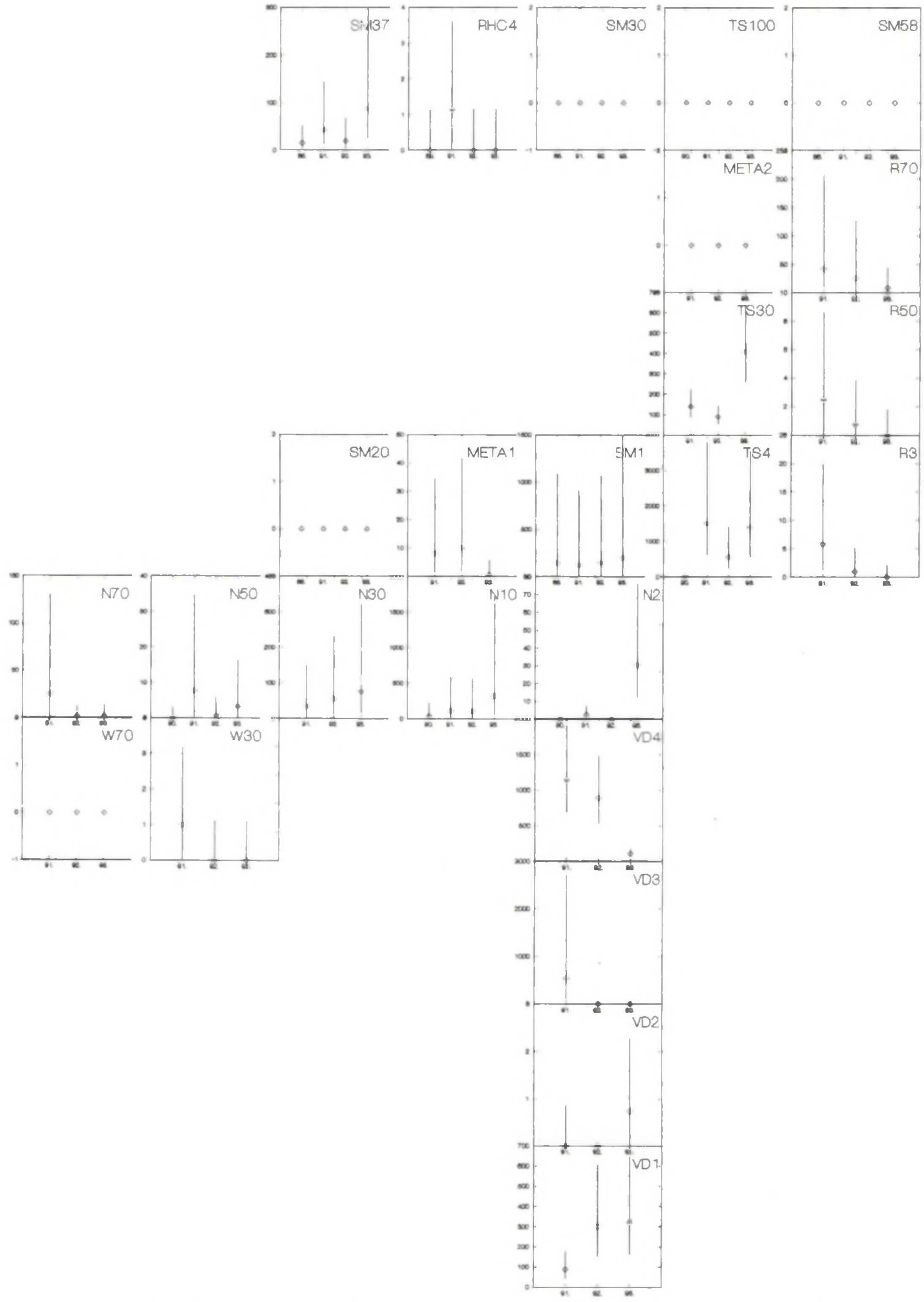

Fig. 3c. Comparison plots of *Urothoe poseidonis* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

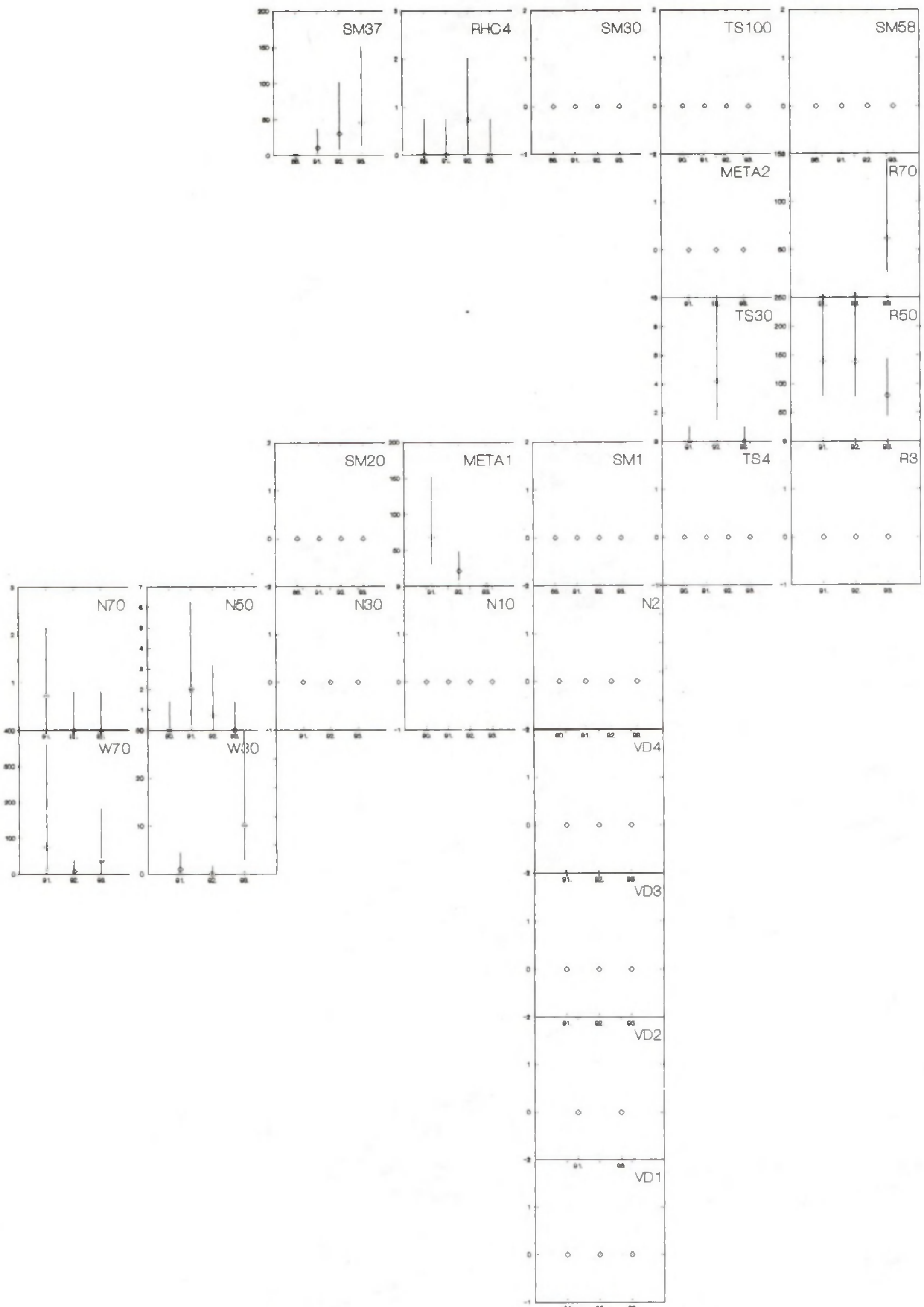

Fig. 3d. Comparison plots of *Echicyamus pusillus* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

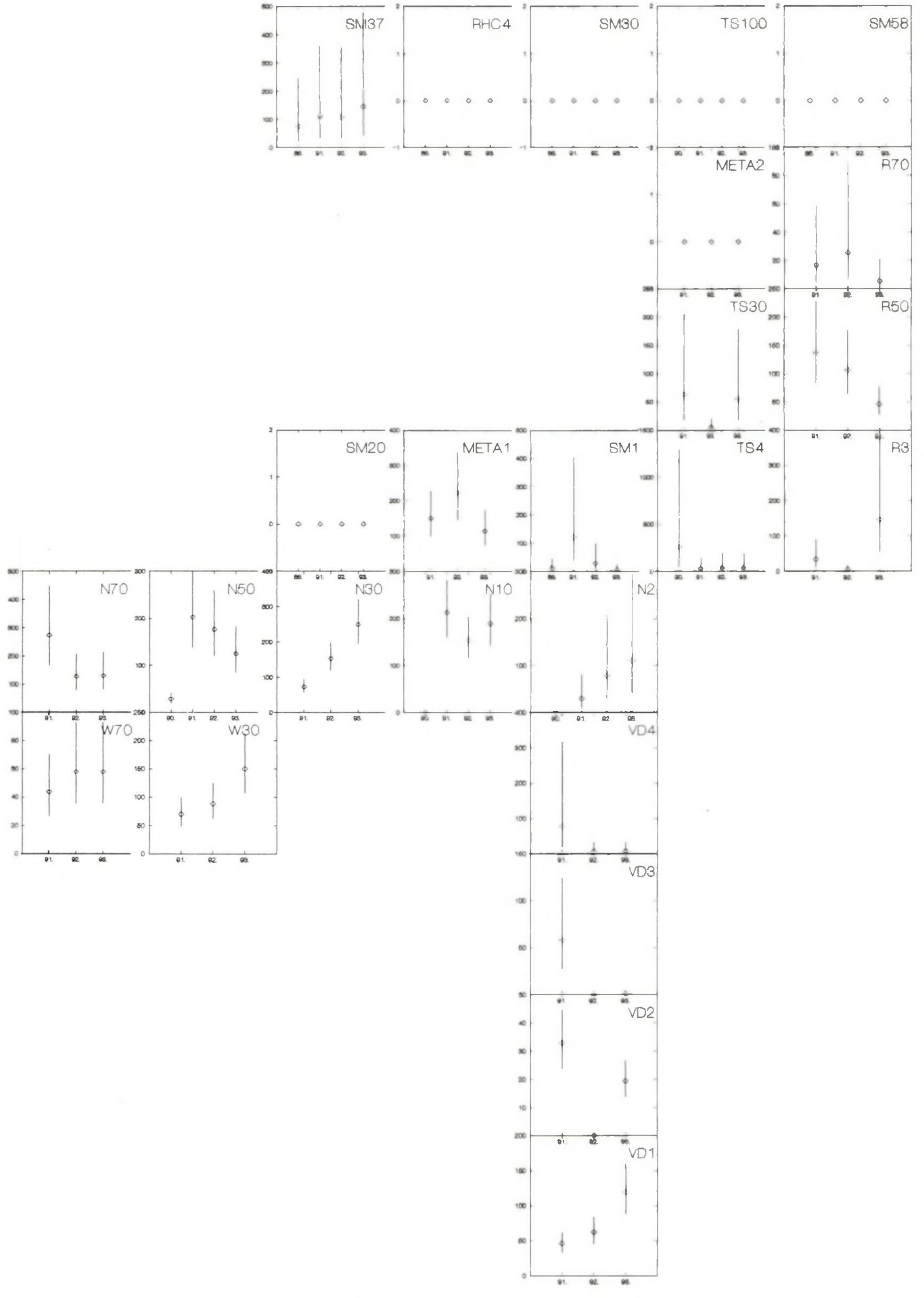

Fig. 3e. Comparison plots of *Nephtys cirrosa* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

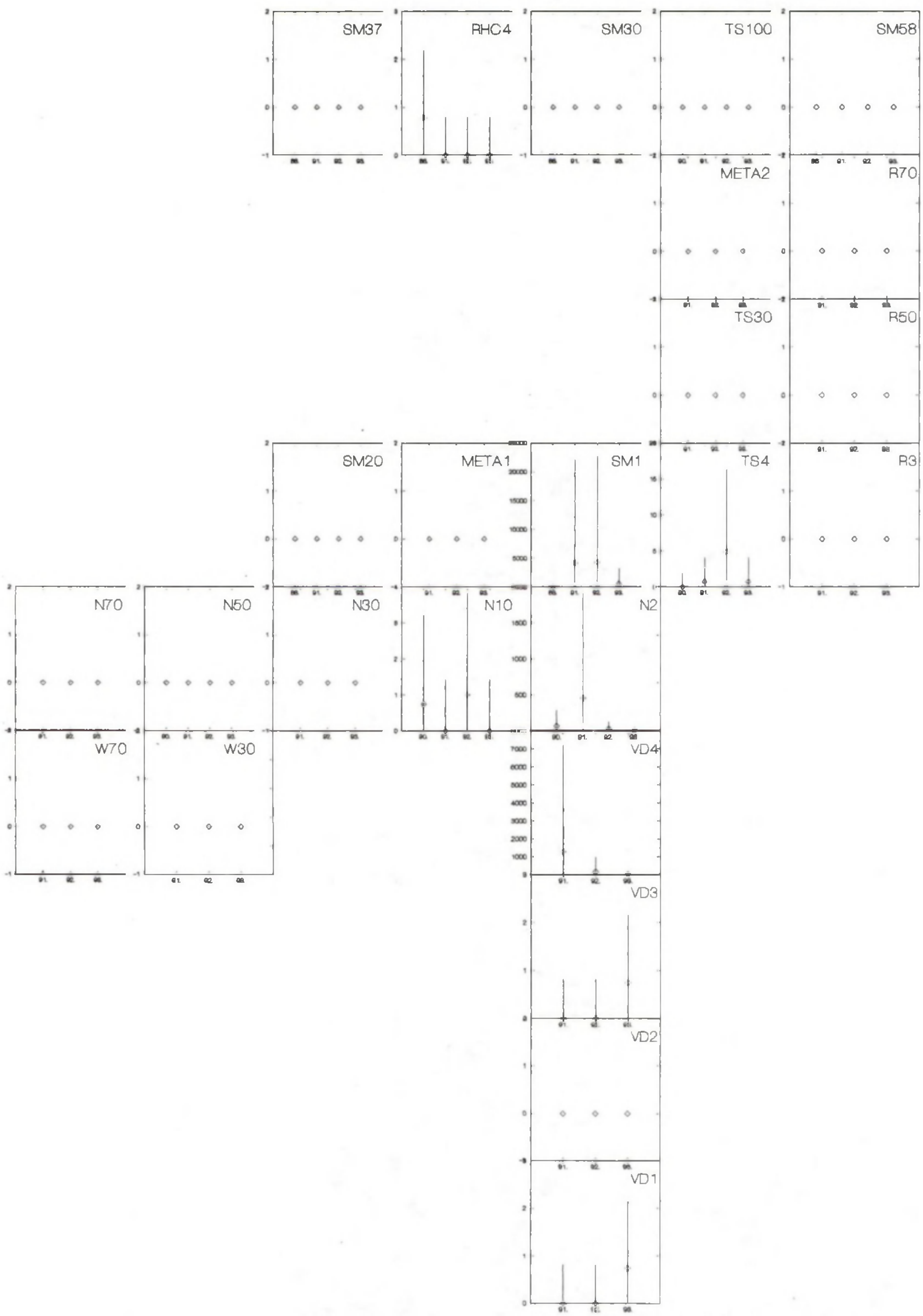

Fig. 3f. Comparison plots of *Spisula subtruncata* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

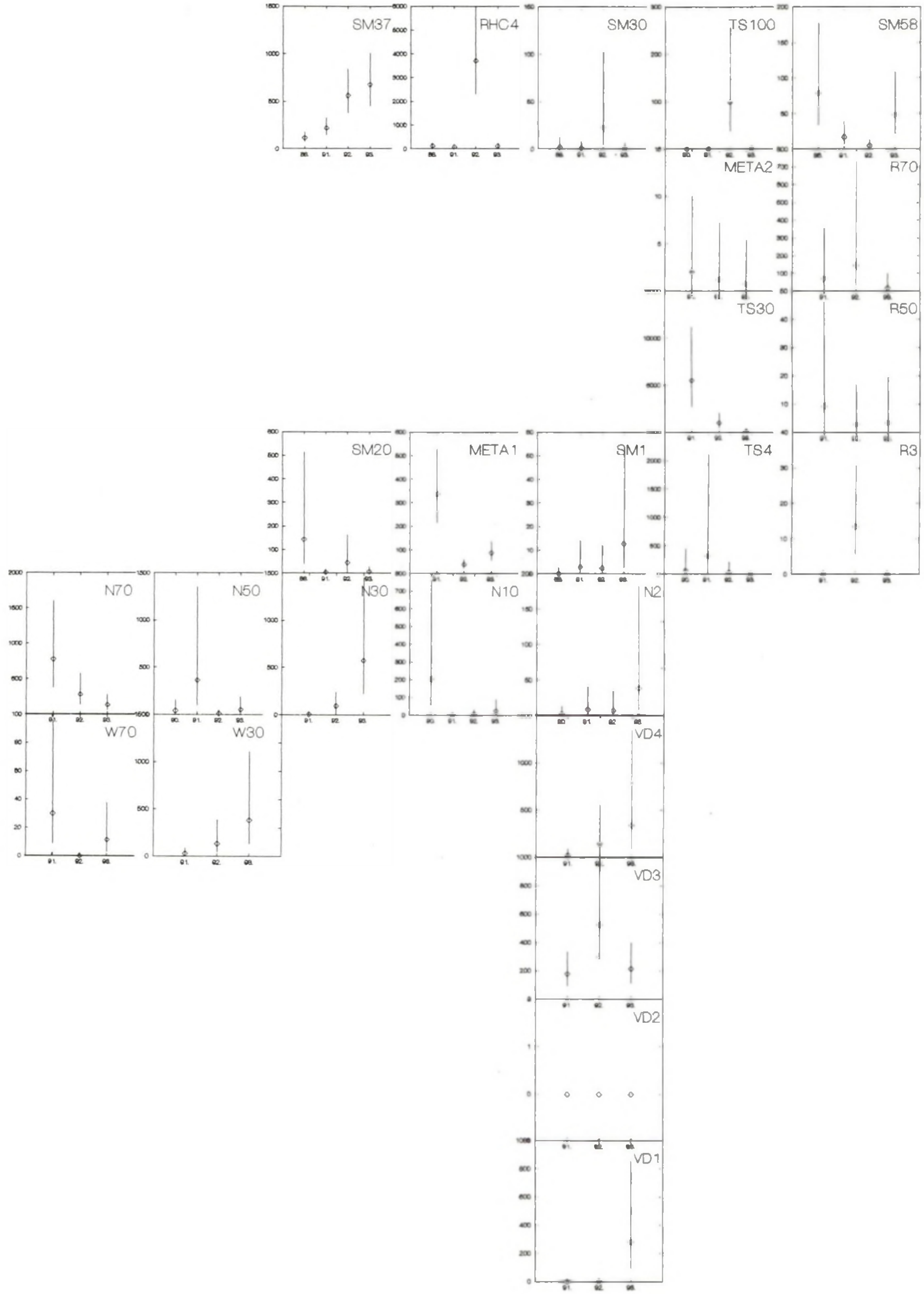

Fig. 3g. Comparison plots of *Spiophanes bombyx* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

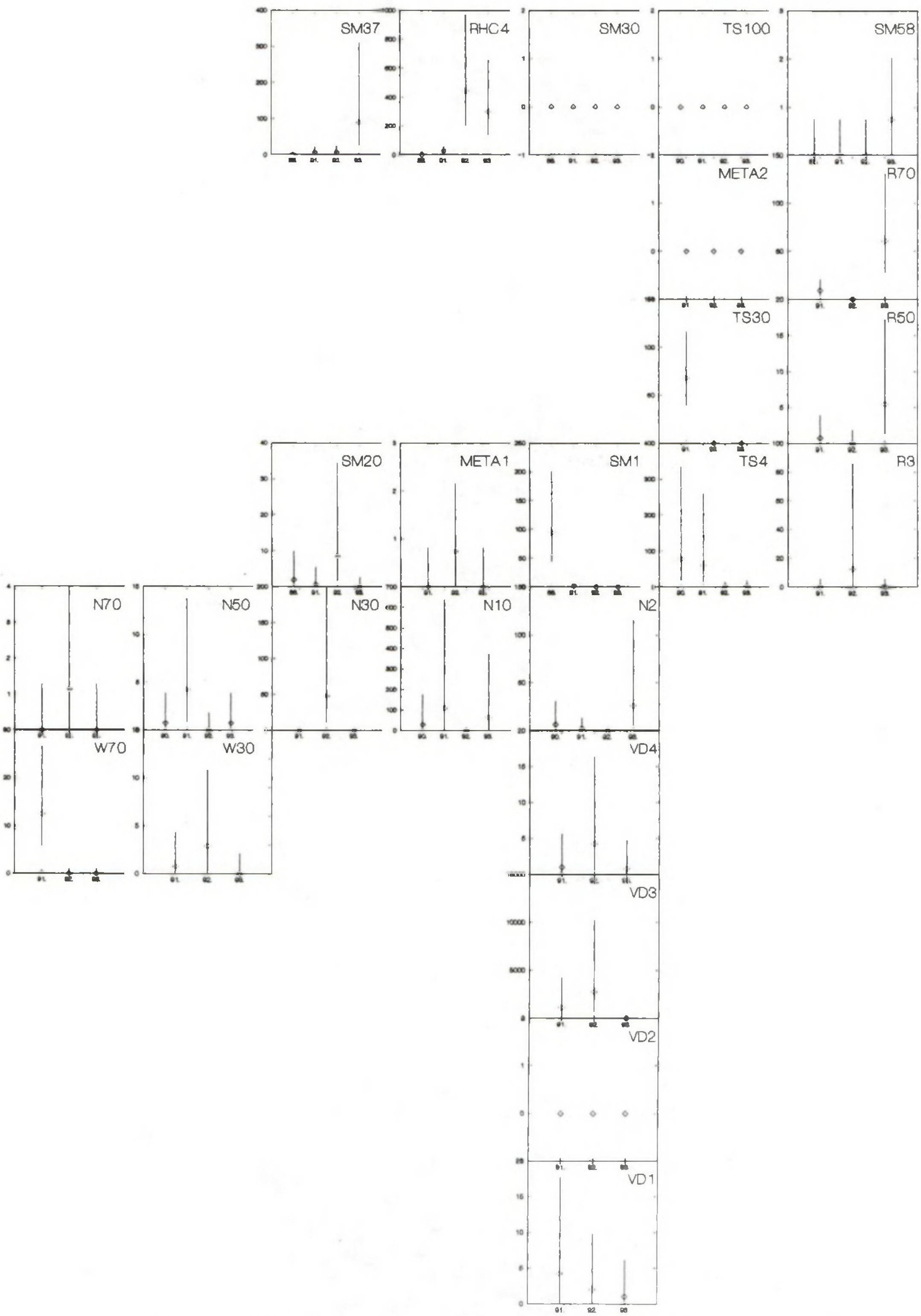

Fig. 3h. Comparison plots of *Lanice conchilega* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

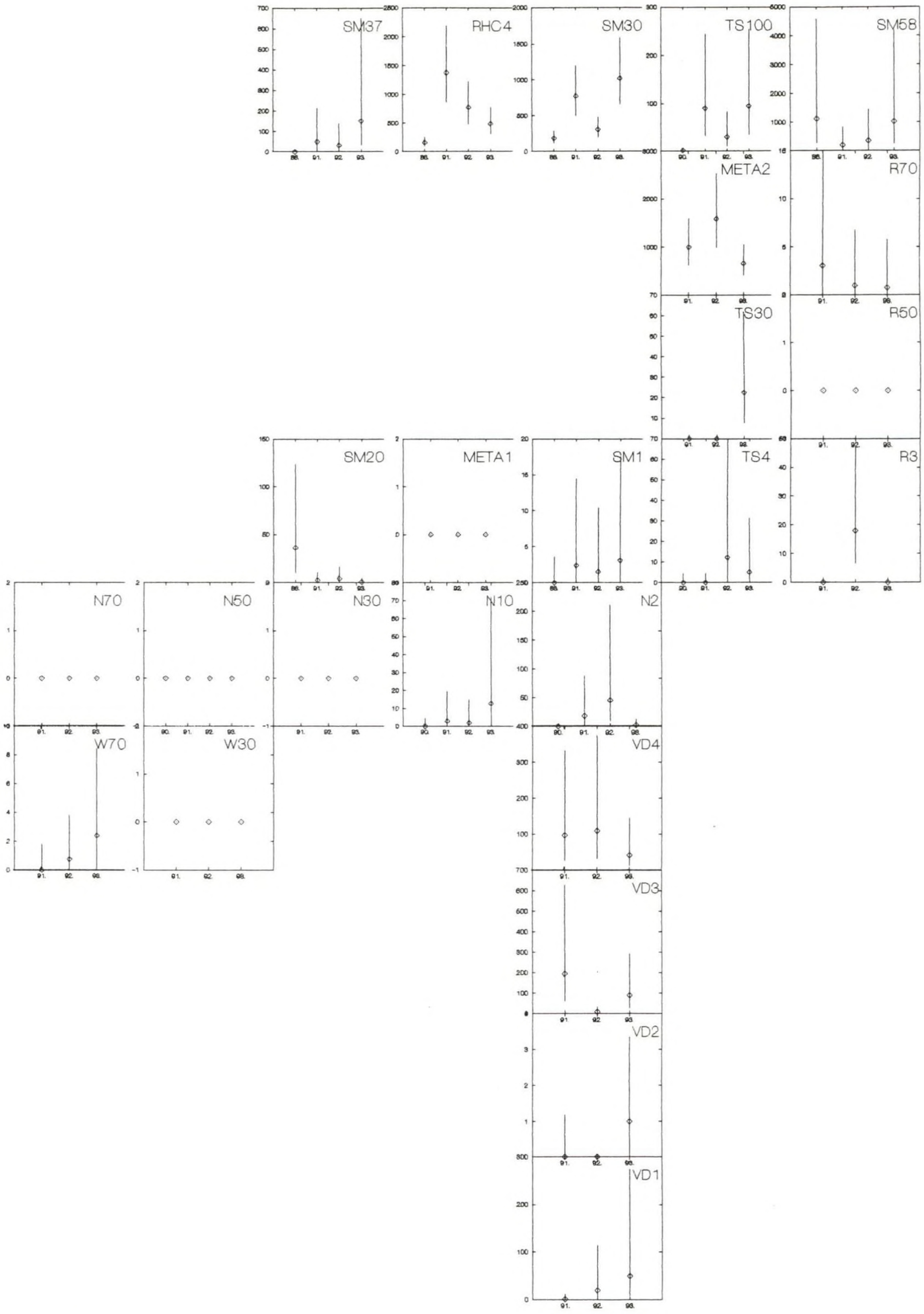

Fig. 3i. Comparison plots of *Mysella bidentata* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

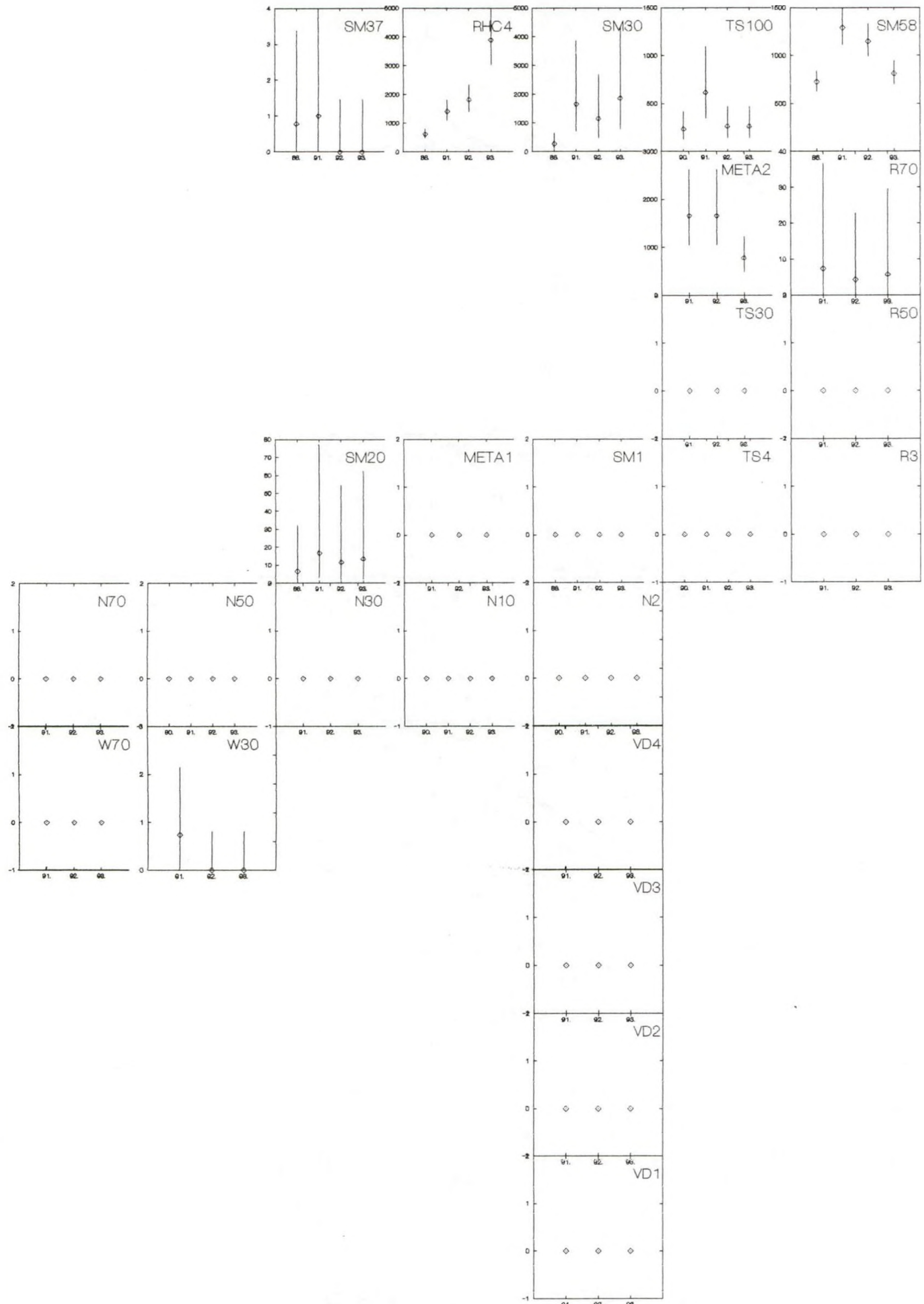

Fig. 3j. Comparison plots of *Amphiura filiformis* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

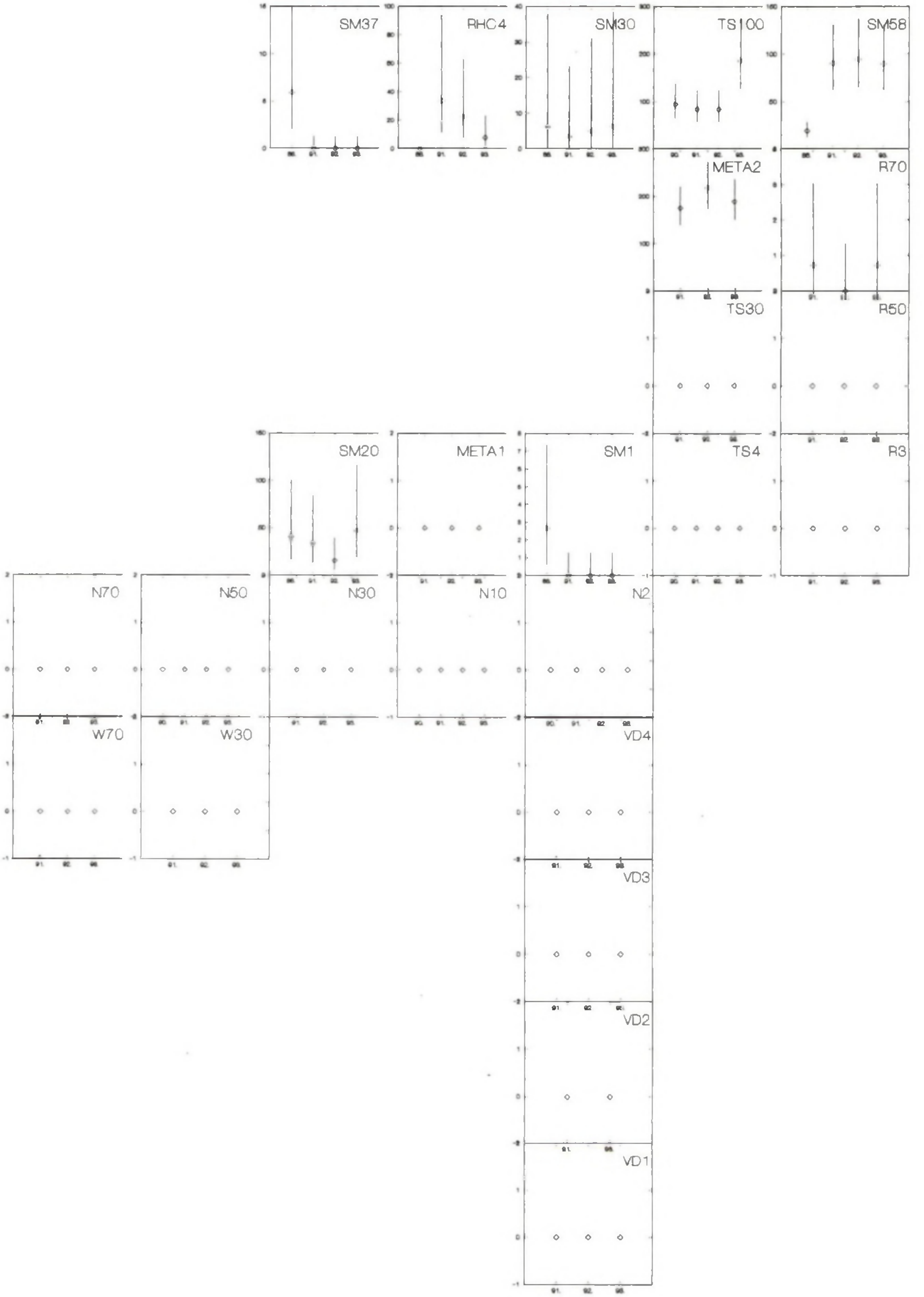

Fig. 3k. Comparison plots of *Callianassa subterranea* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

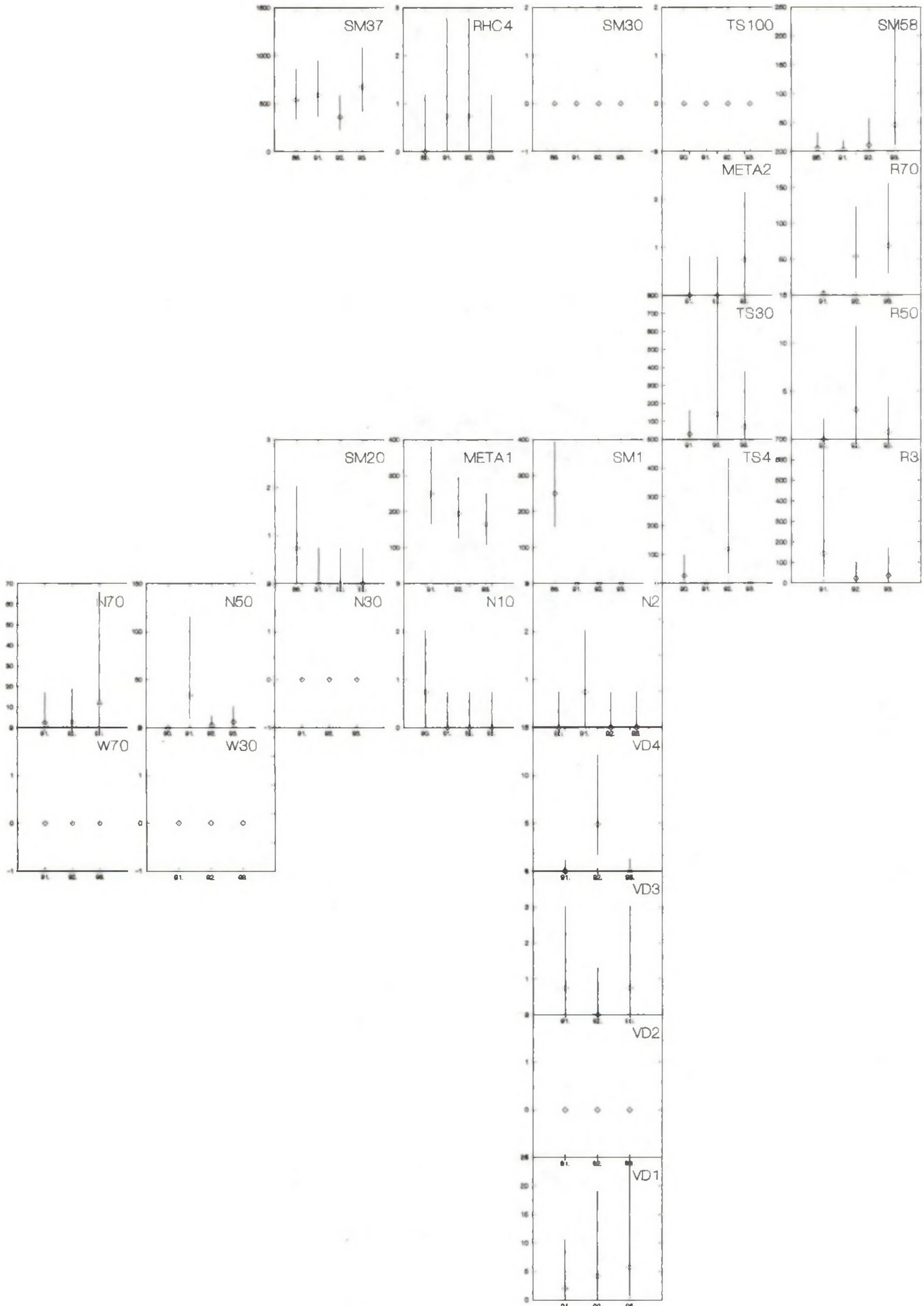

Fig. 31. Comparison plots of *Bathyporeia elegans* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

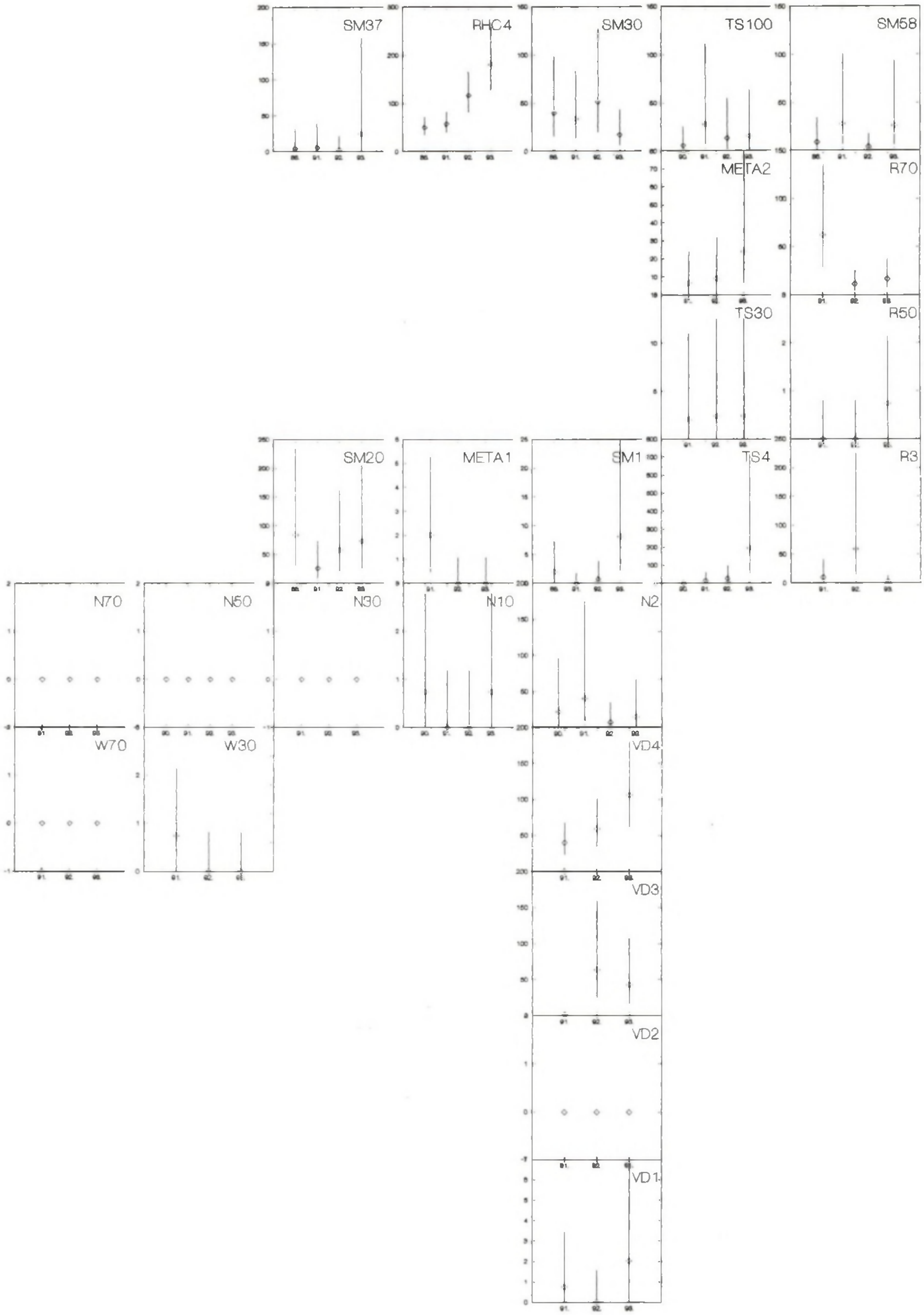

Fig. 3m. Comparison plots of *Nephtys hombergii* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

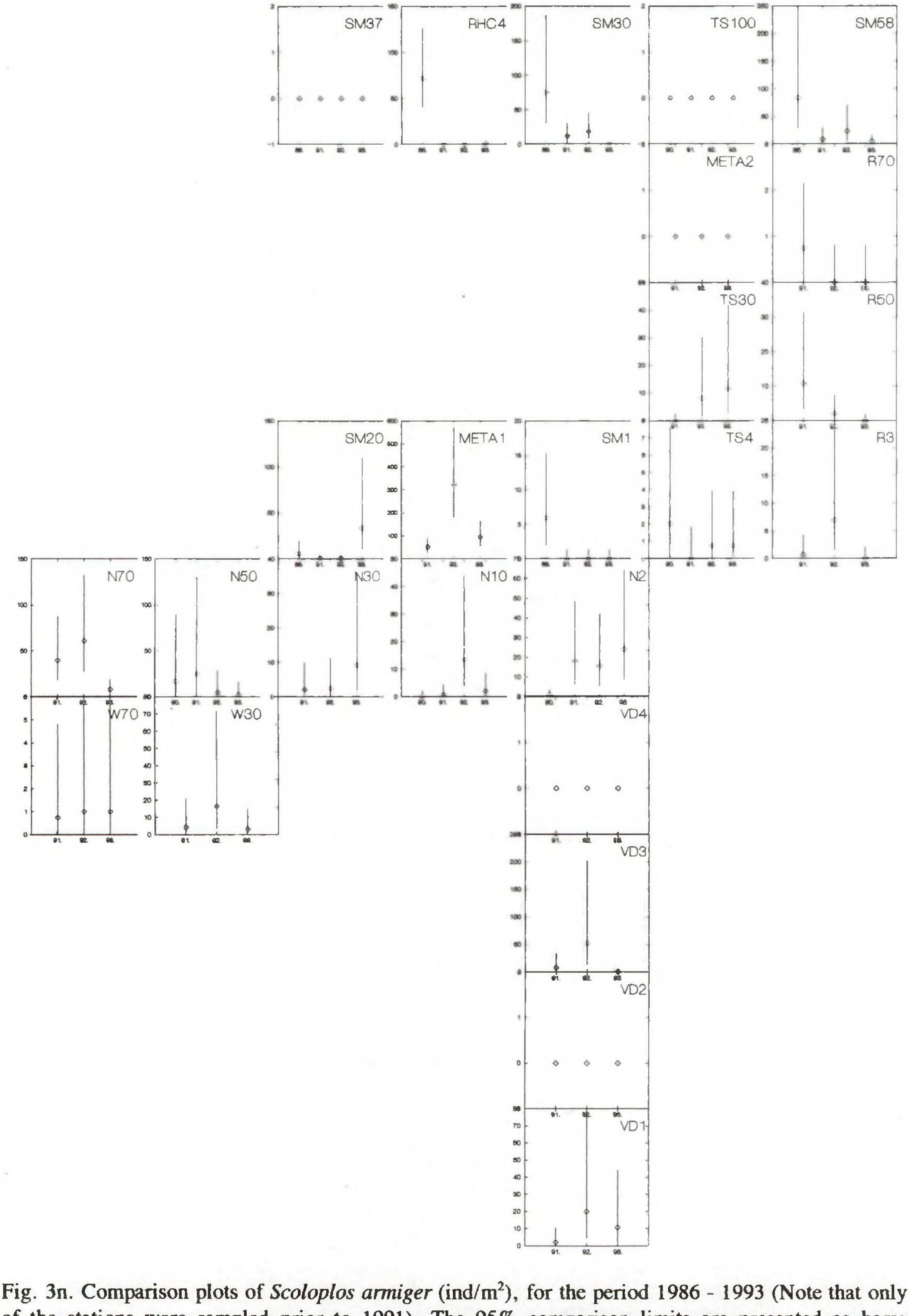

Fig. 3n. Comparison plots of *Scoloplos armiger* (ind/m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

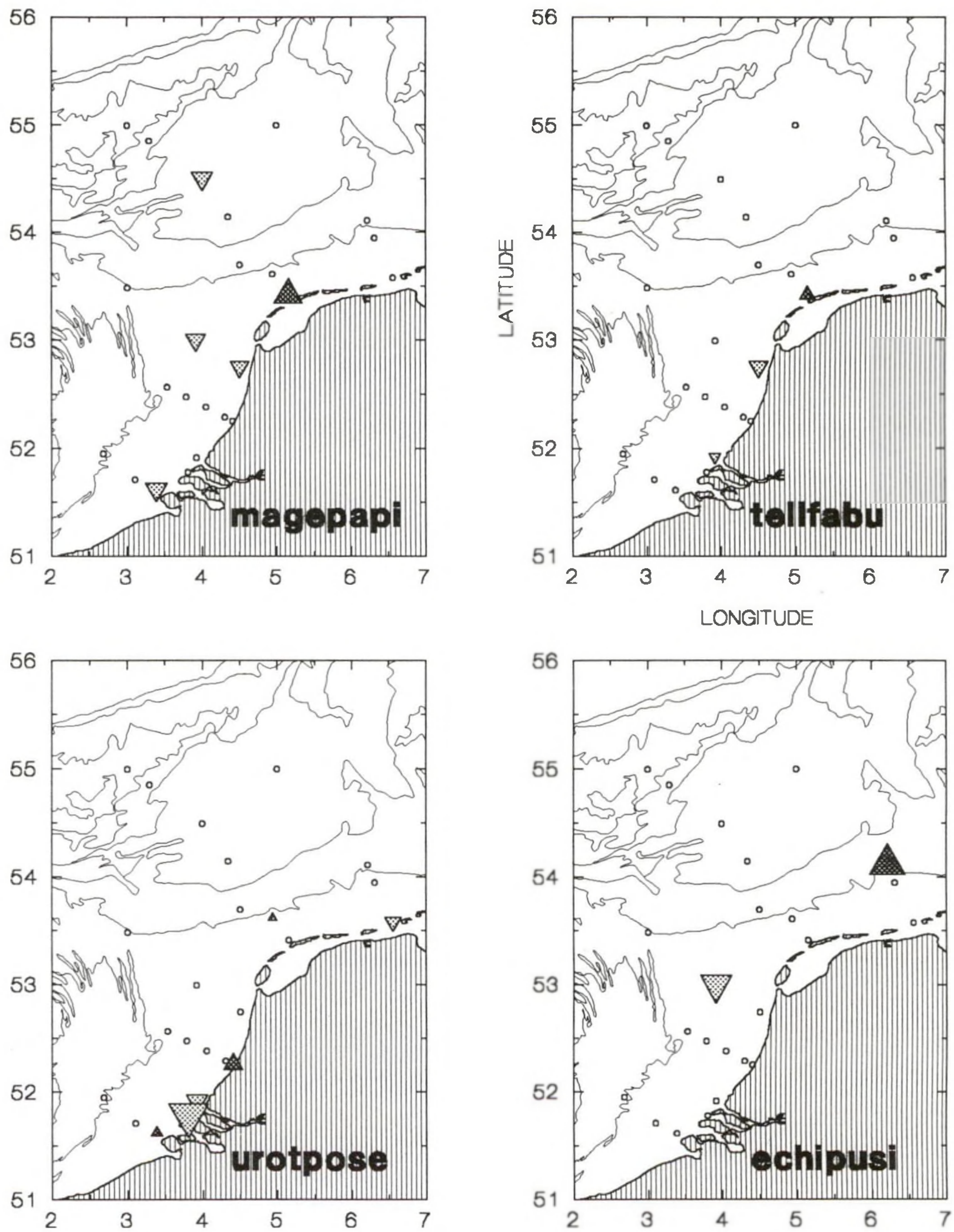

Fig. 4a. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ₒ indicates no significant trend.

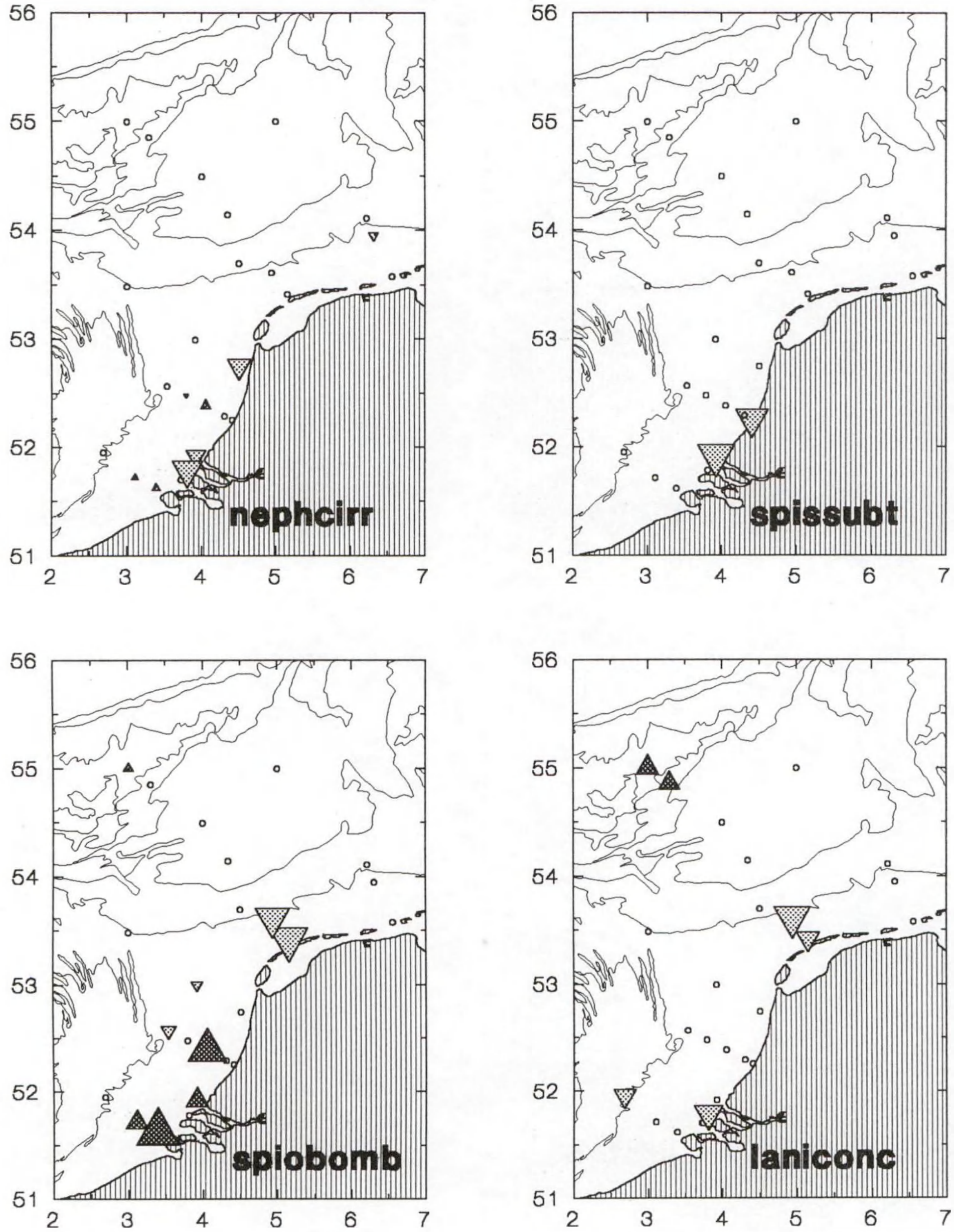

Fig. 4b. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.

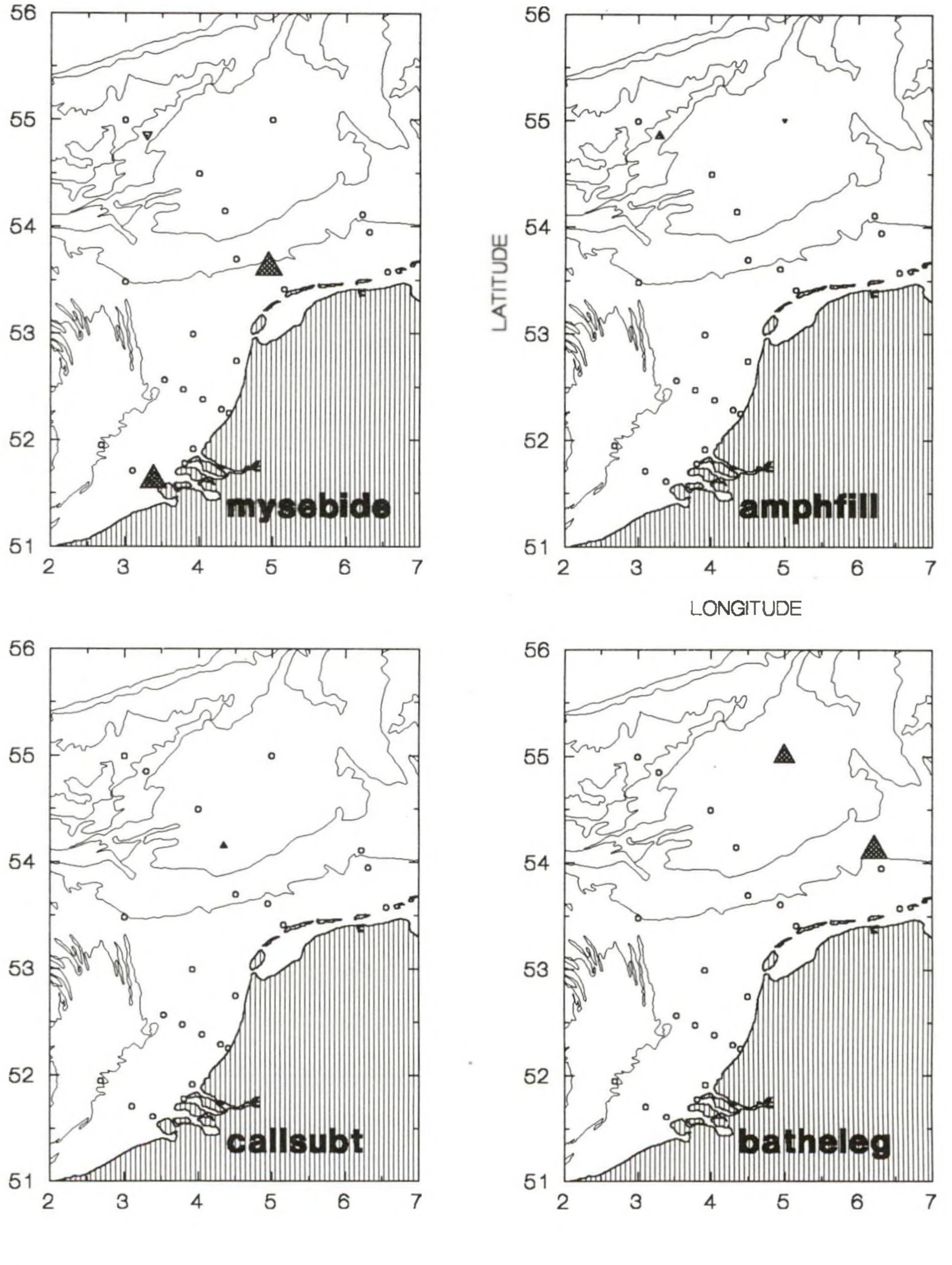

Fig. 4c. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▴ and ▾ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ₒ indicates no significant trend.

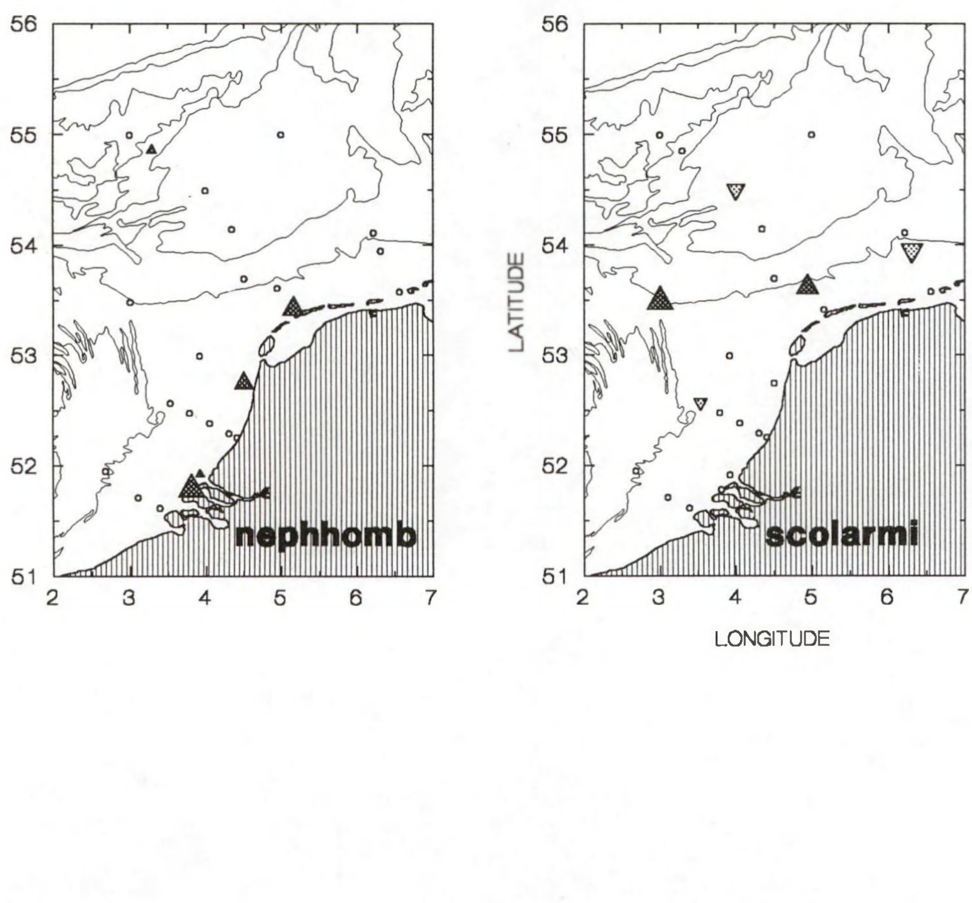

Fig. 4d. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ₒ indicates no significant trend.

Table 4. Overview of differences and trends in attributes of the community and phyla. Results for single stations pertain to the period 1991-1993, those for station groups also for extended periods of time(indicated in the second column). ▒ indicates a significant difference among the mean densities of the studied years(c.f. Fig. 5a-r). The symbols > and < respectively stand for an upward or downward trend in this period(c.g. Fig. 6a-e). Double arrows(> >) indicate that the trend remains significant over the extended time period, viz. 1990-1993 for stations TS4, TS100, N2, N10, N50, and 1986-1993 for stations SM30, RHC4, SM58, SM1, SM20 and SM37.

STATION	PERIOD	SH-W	SIMPSON	TOT-SPEC	CRUSSPEC	MOLLSPEC	POLYSPEC	TOT-DENS	CRUSDENS	ECHIDENS	MOLLDENS	POLYDENS	MISCDENS	TOT-BIOM	CRUSBIOM	ECHIBIOM	MOLLBIOM	POLYBIOM	MISCBIOM	CLUSTER
META2	91-93	▒>	▒<	<			▒<	▒<			▒<					▒<				OYSTER 1
TS100	91-93	▒>>	▒<<						▒>>	<	▒>>					▒<<				
oyster1 cluster	90-93																<			
oyster1 cluster	91-93																	>	>	
SM30	91-93	▒		▒	▒	▒	▒<		▒		▒	<	<					<<		OYSTER 2
RHC4	91-93	<<	▒>>					▒		▒>>		▒	▒<					<		
SM58	91-93			▒	▒>					▒<	▒		▒<<	▒<		▒<				
oyster2 cluster	86-93																			
oyster2 cluster	91-93												▒	▒	>					
R3	91-93			▒			▒	▒					▒							COASTAL
TS4	91-93		▒<					▒			▒>>	▒			▒>>			▒>>		
TS30	91-93	▒>	▒<	>		▒	>	▒<	>			<				>		▒<		
SM1	91-93					▒<		▒			▒	▒	<<	▒					▒<	
N2	91-93	▒>	<								<									
N10	91-93	▒	▒				>>			▒<			▒>>						▒>>	
VD4	91-93	▒>	▒<					▒<	▒<	▒	<				▒					
VD3	91-93	▒	▒		▒<			▒	▒<			▒		▒>	▒<		▒>	▒<		
VD1	91-93	▒		▒>		▒>	>	▒>		▒	▒>	▒>	▒>		▒					
coastal cluster	86-93																>			
coastal cluster	90-93						>													
coastal cluster	91-93	▒	▒				>													
R50	91-93	▒>	▒	>			▒>													OFFSHORE
R70	91-93												▒					▒	<	
META1	91-93		▒			▒<		▒<		▒<	▒	▒<						▒		
SM20	91-93														▒					
N30	91-93		>	▒>			▒>	▒>				▒>						▒>		
N50	91-93		▒<<	▒<		<	▒	▒<			▒<	▒<								
N70	91-93		<	▒<		▒	▒	▒<		<	▒	▒<		▒<			▒			
VD2	91-93				▒<				▒<											
W30	91-93		>		<				<			▒>						▒>	<	
W70	91-93	▒		▒				▒				▒>	▒>						▒>	
SM37	91-93			▒>>	▒	▒>>	▒>>	▒>>	▒			▒>>	▒>		▒>>			<	▒>	
offshore cluster	86-93																			
offshore cluster	90-93																			
offshore cluster	91-93																			

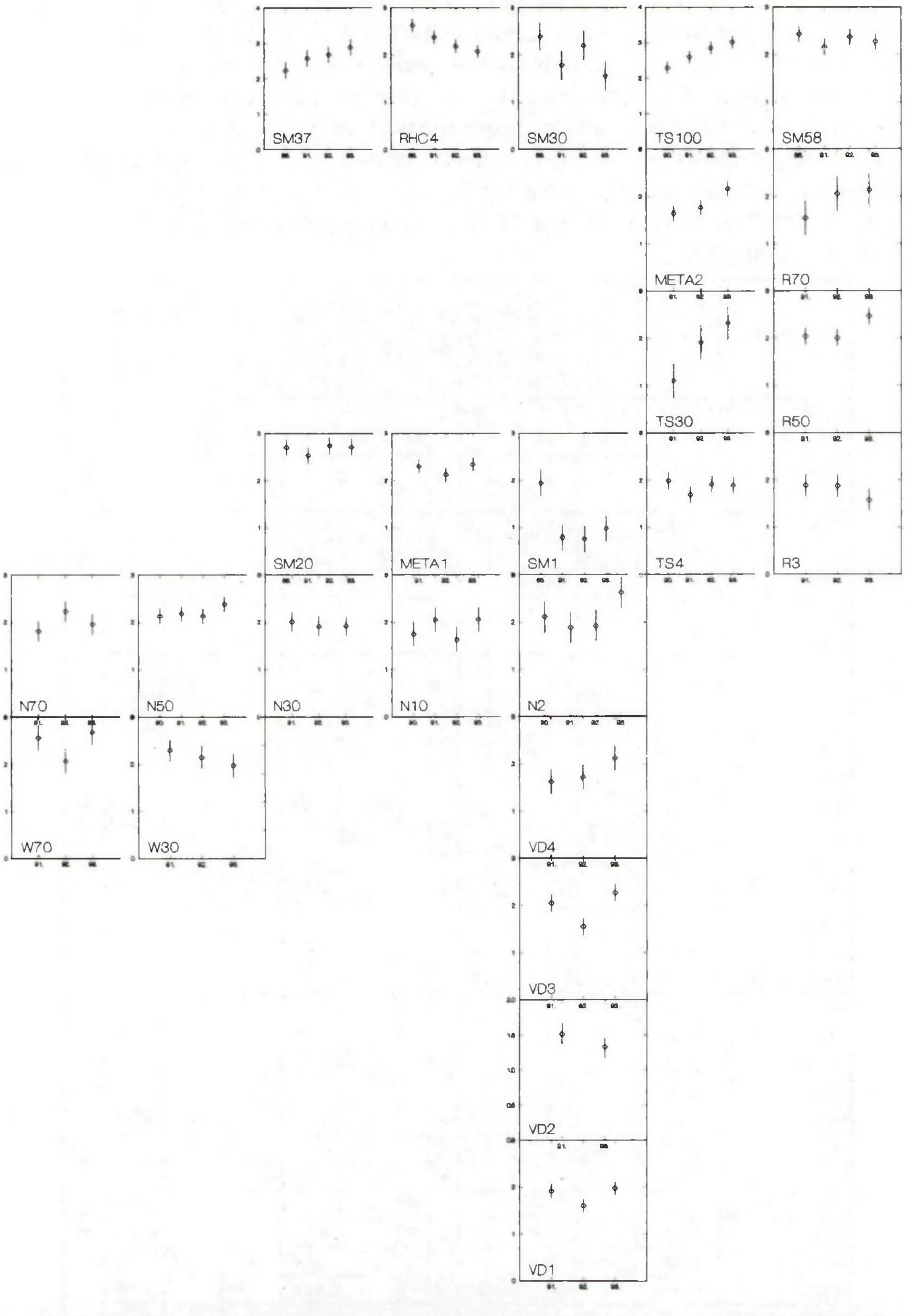

Fig. 5a. Comparison plots with Shannon-Wiener diversity figures, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

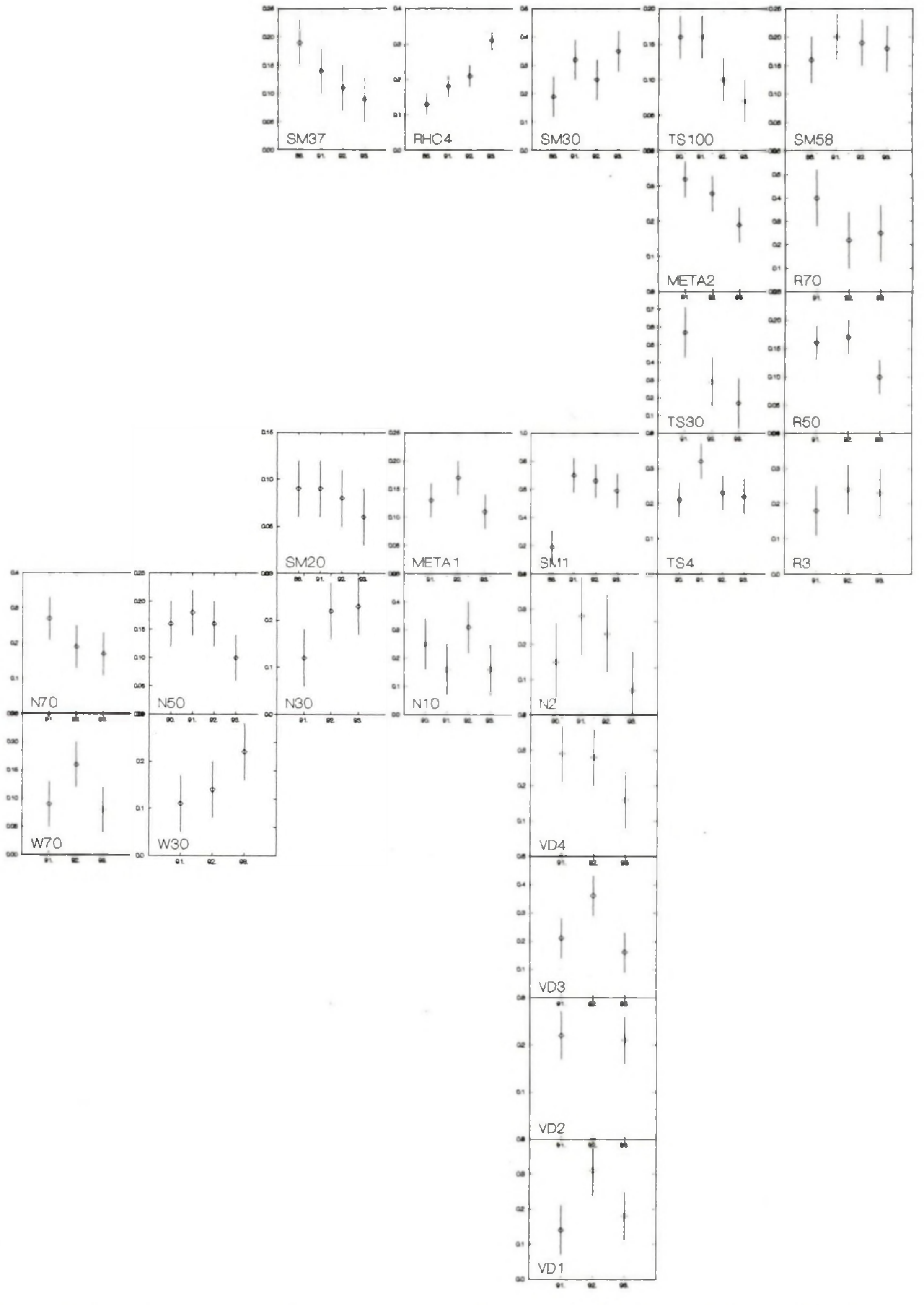

Fig. 5b. Comparison plots with Simpson's dominance figures, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

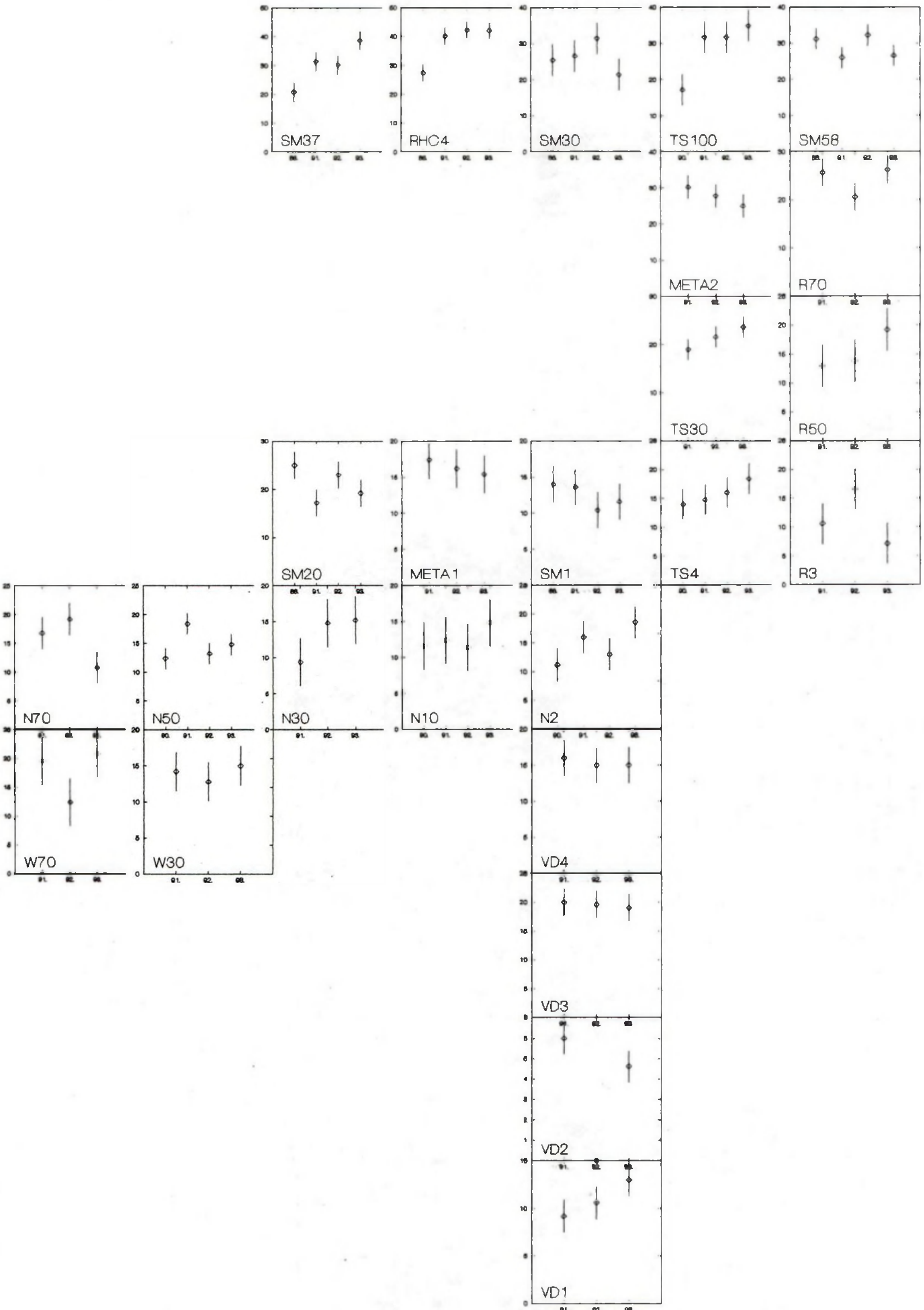

Fig. 5c. Comparison plots with the total number of species per sample, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

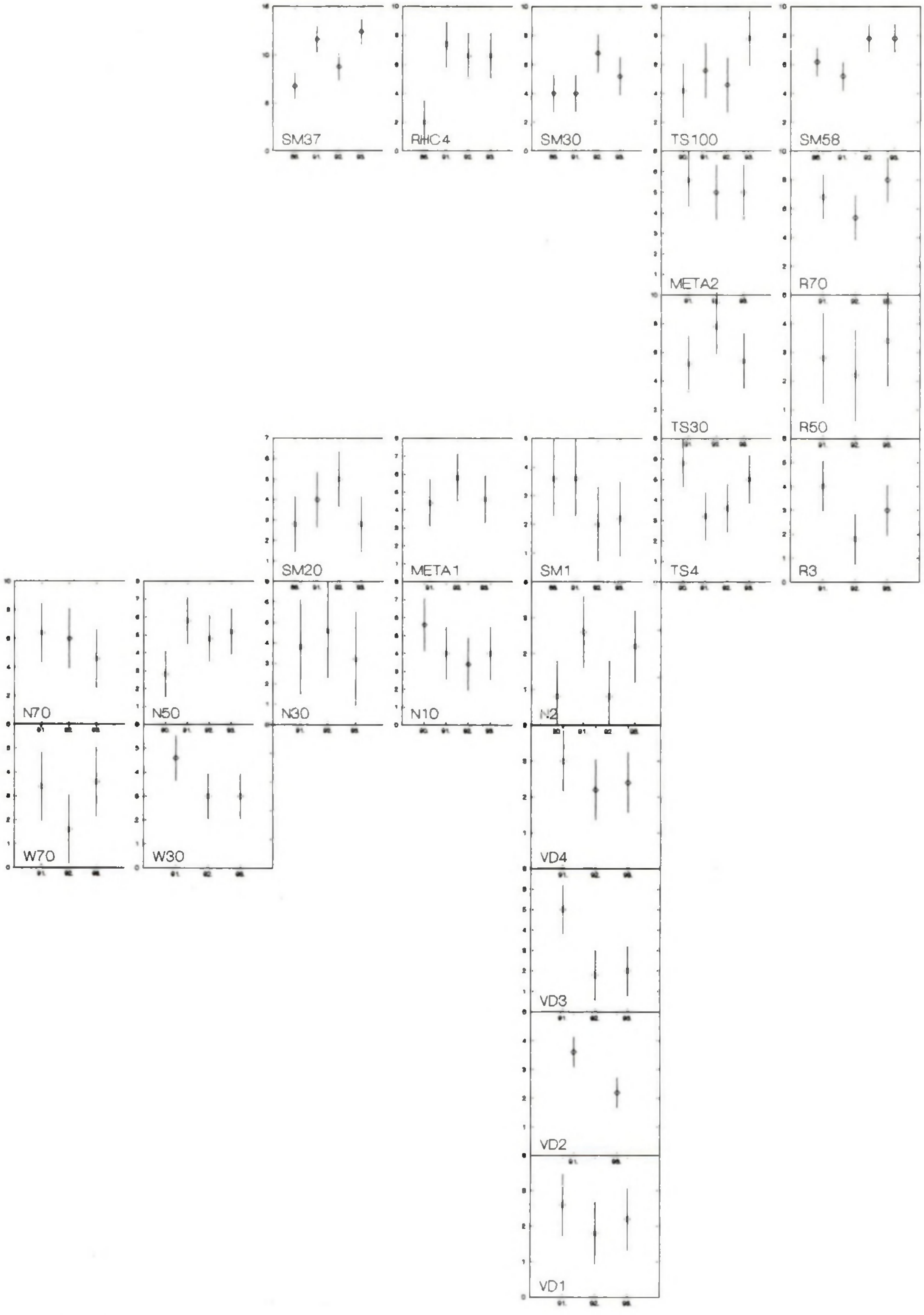

Fig. 5d. Comparison plots with the total number of Crustacean species per sample, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

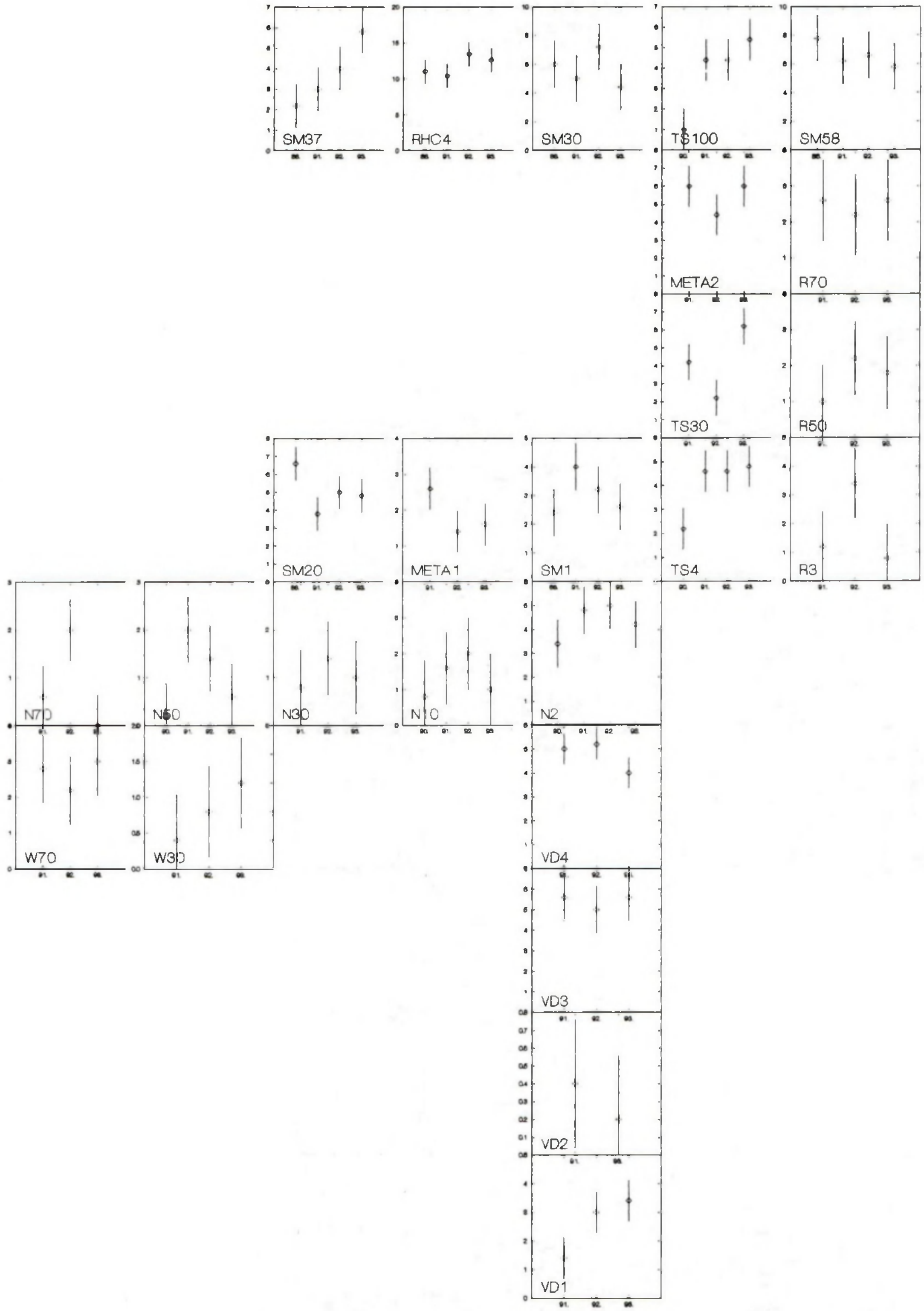

Fig. 5e. Comparison plots with the total number of Mollusc species per sample, for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

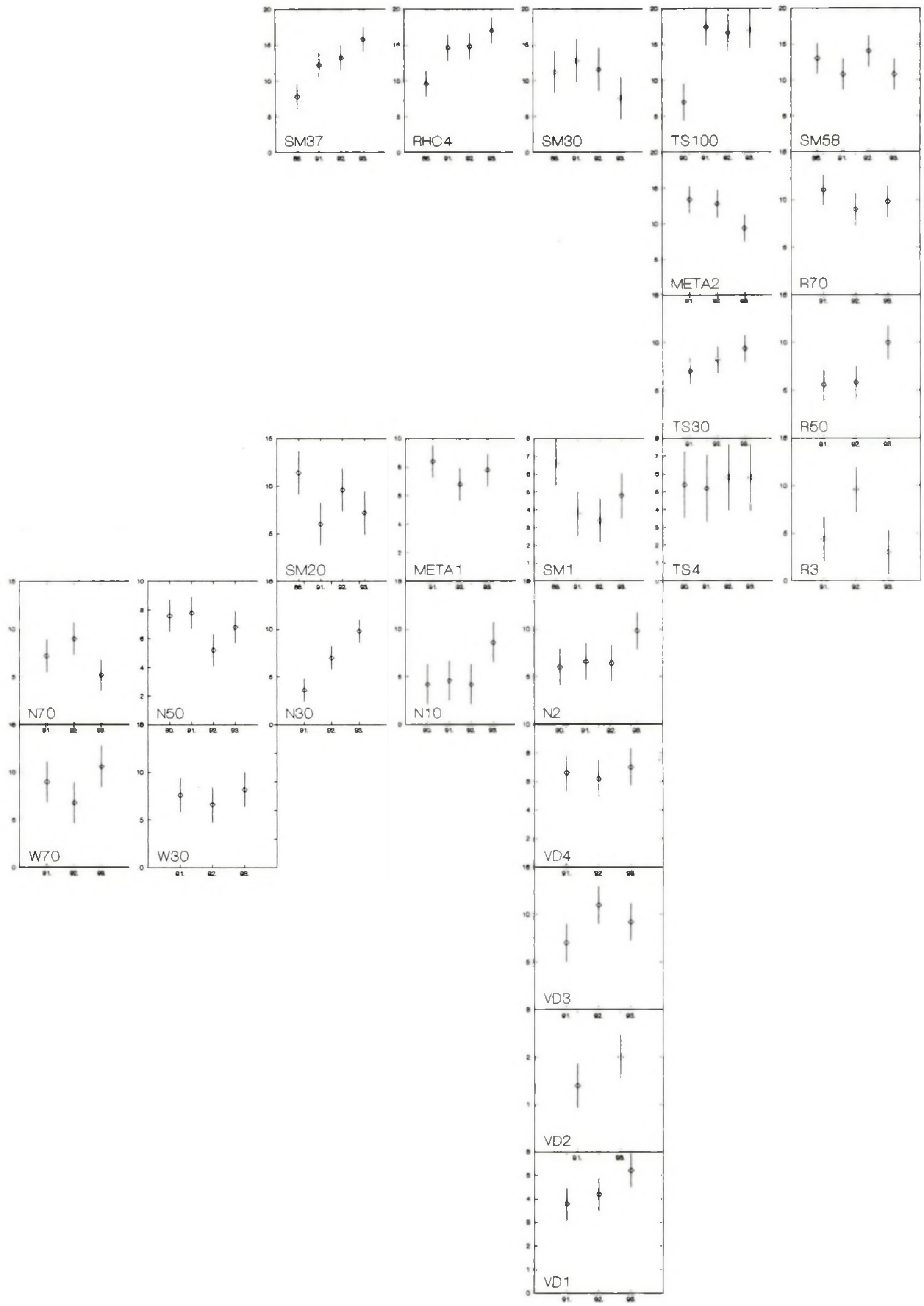

Fig. 5f. Comparison plots with the total number of Polychaete species per sample, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

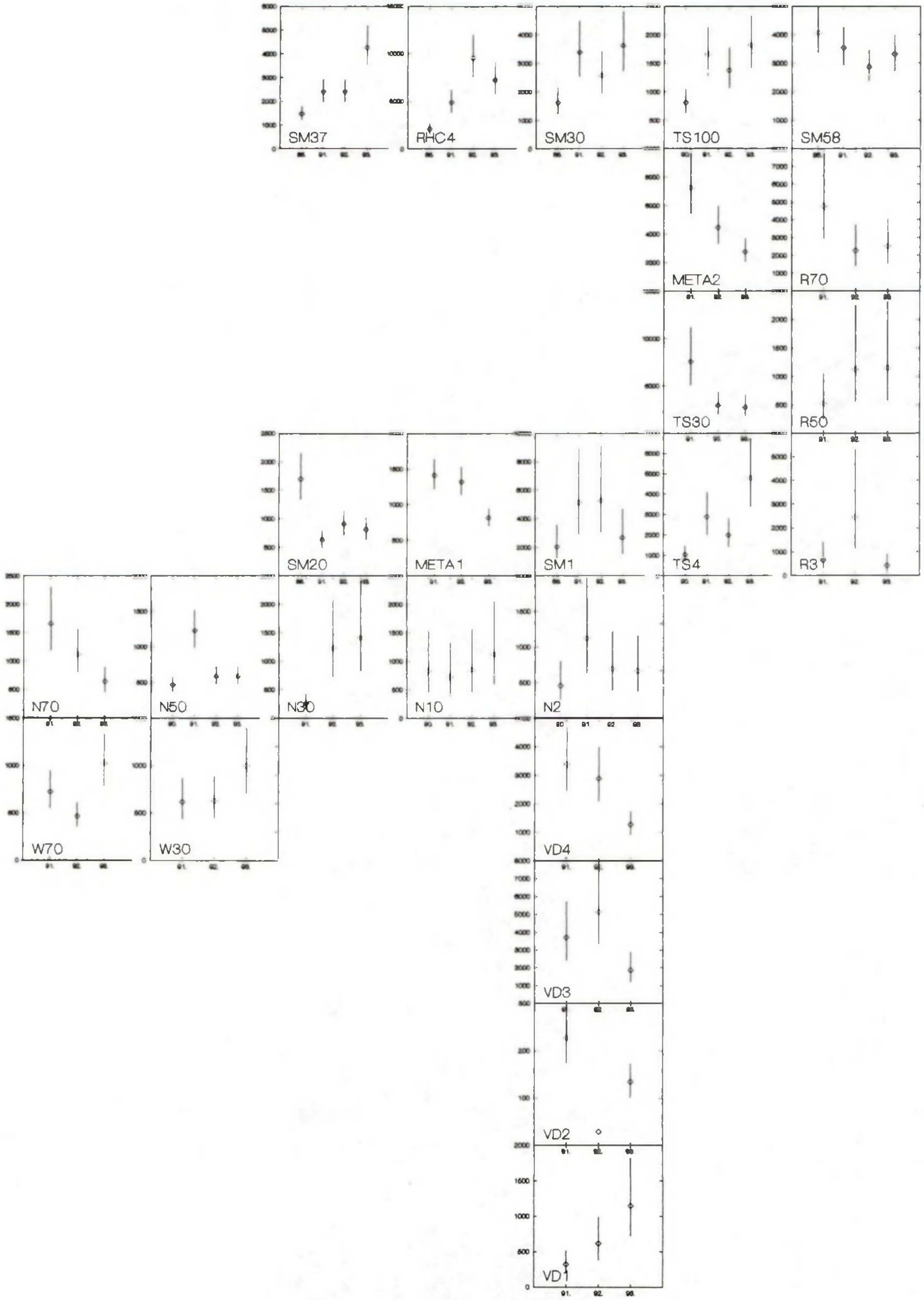

Fig. 5g. Comparison plots with the total density (ind./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

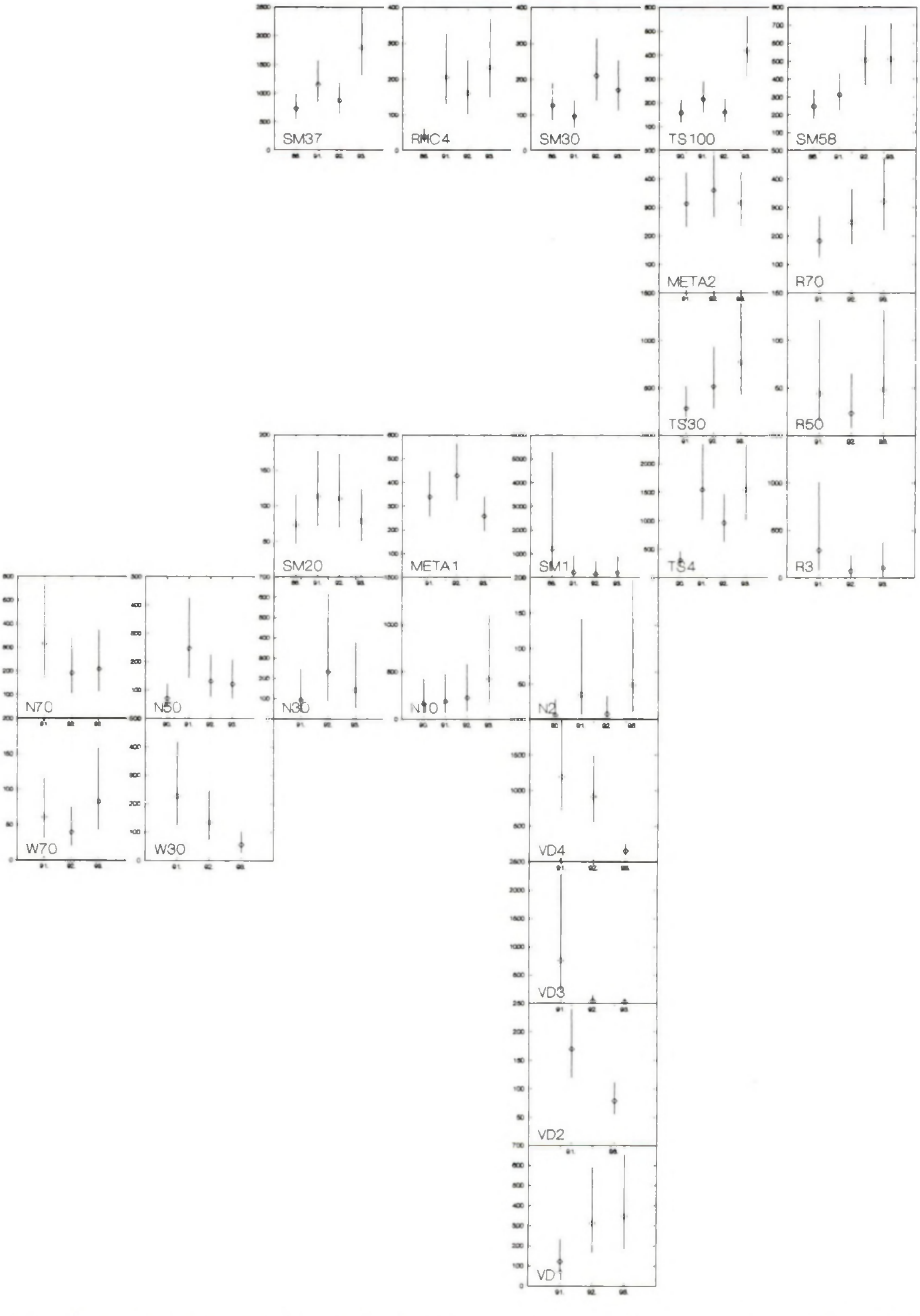

Fig. 5h. Comparison plots with the density of the Crustaceans (ind./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

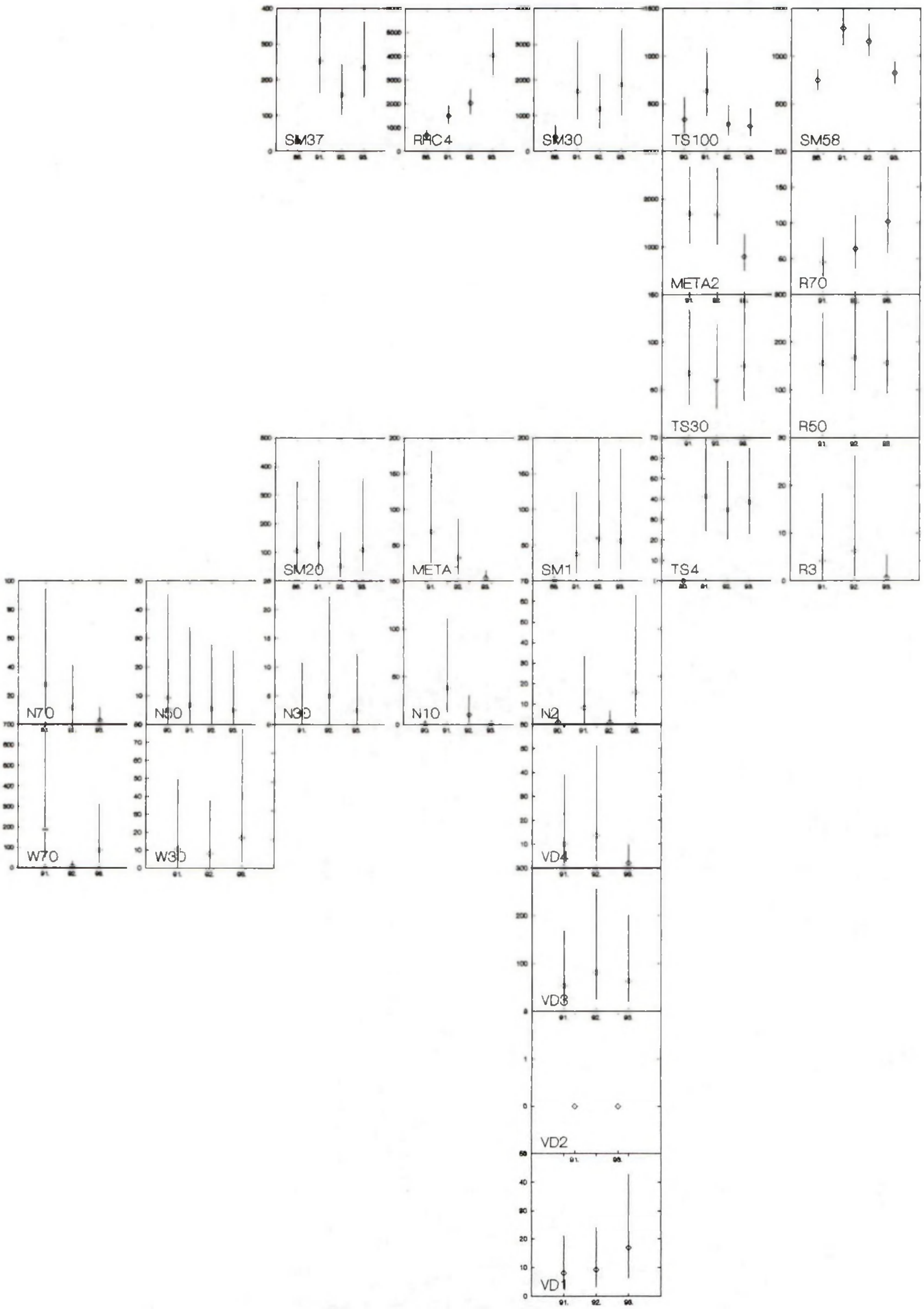

Fig. 5i. Comparison plots with the density of the Echinoderms (ind./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

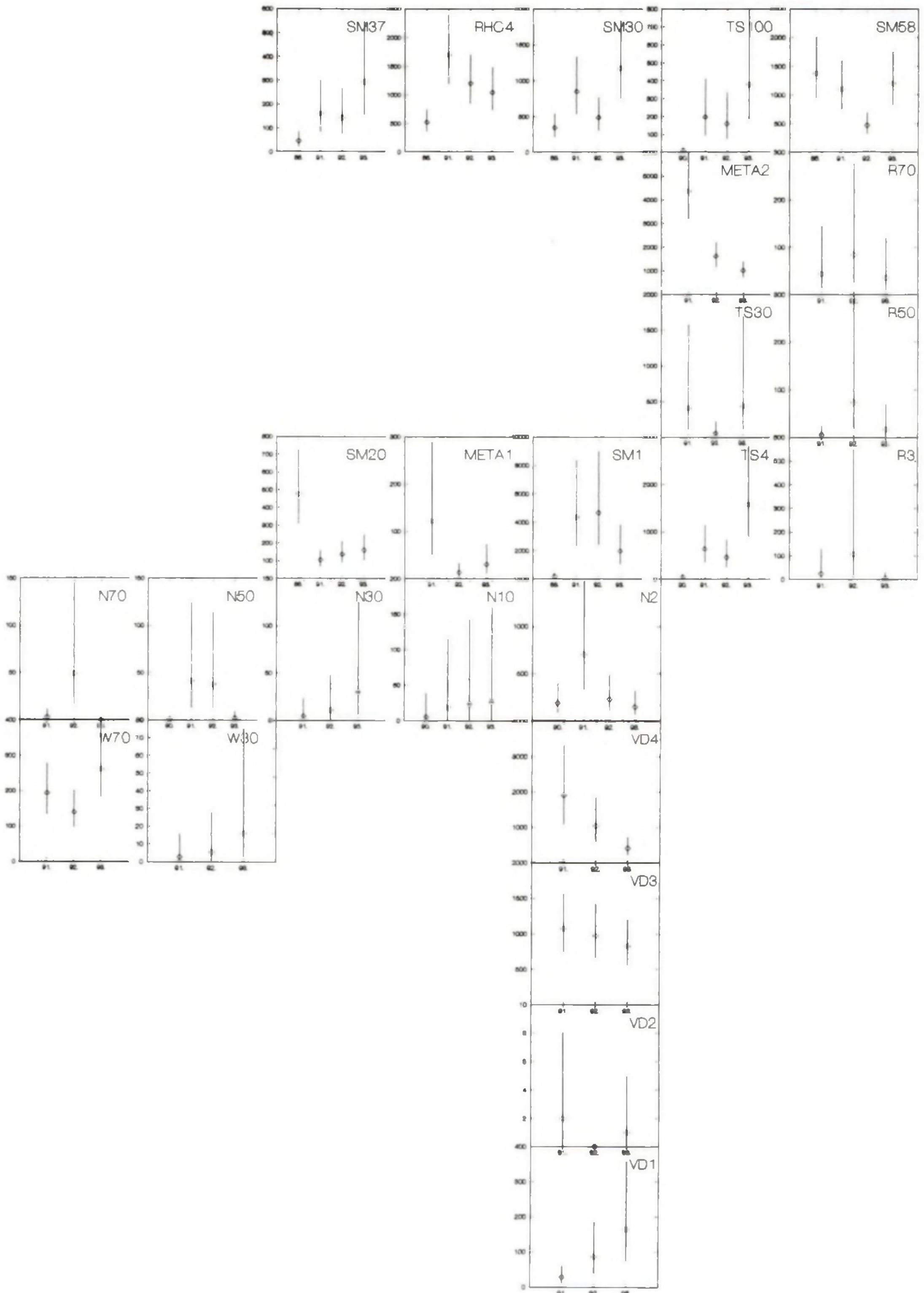

Fig. 5j. Comparison plots with the density of the Molluscs (ind./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

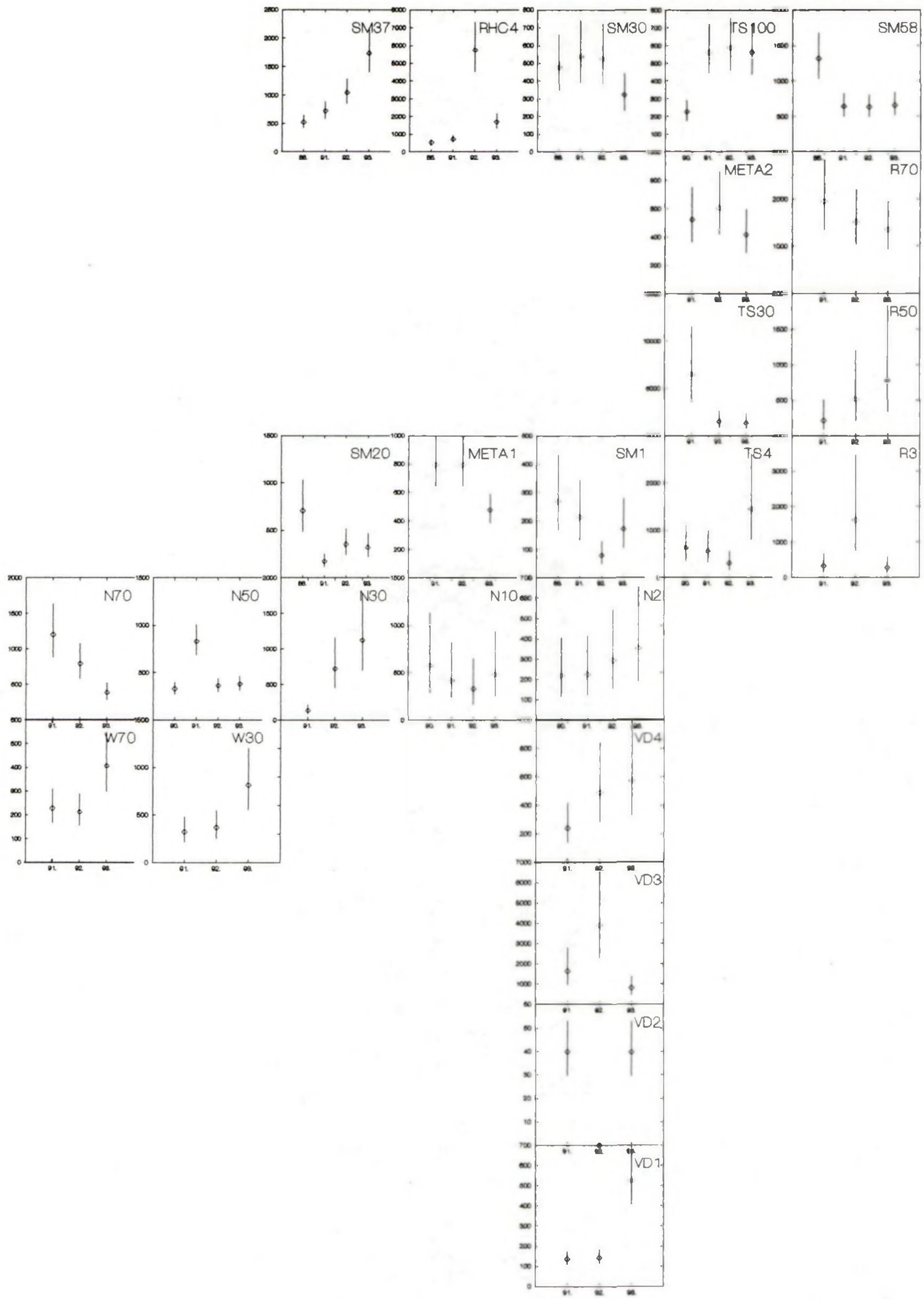

Fig. 5k. Comparison plots with the density of the Polychaetes (ind./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

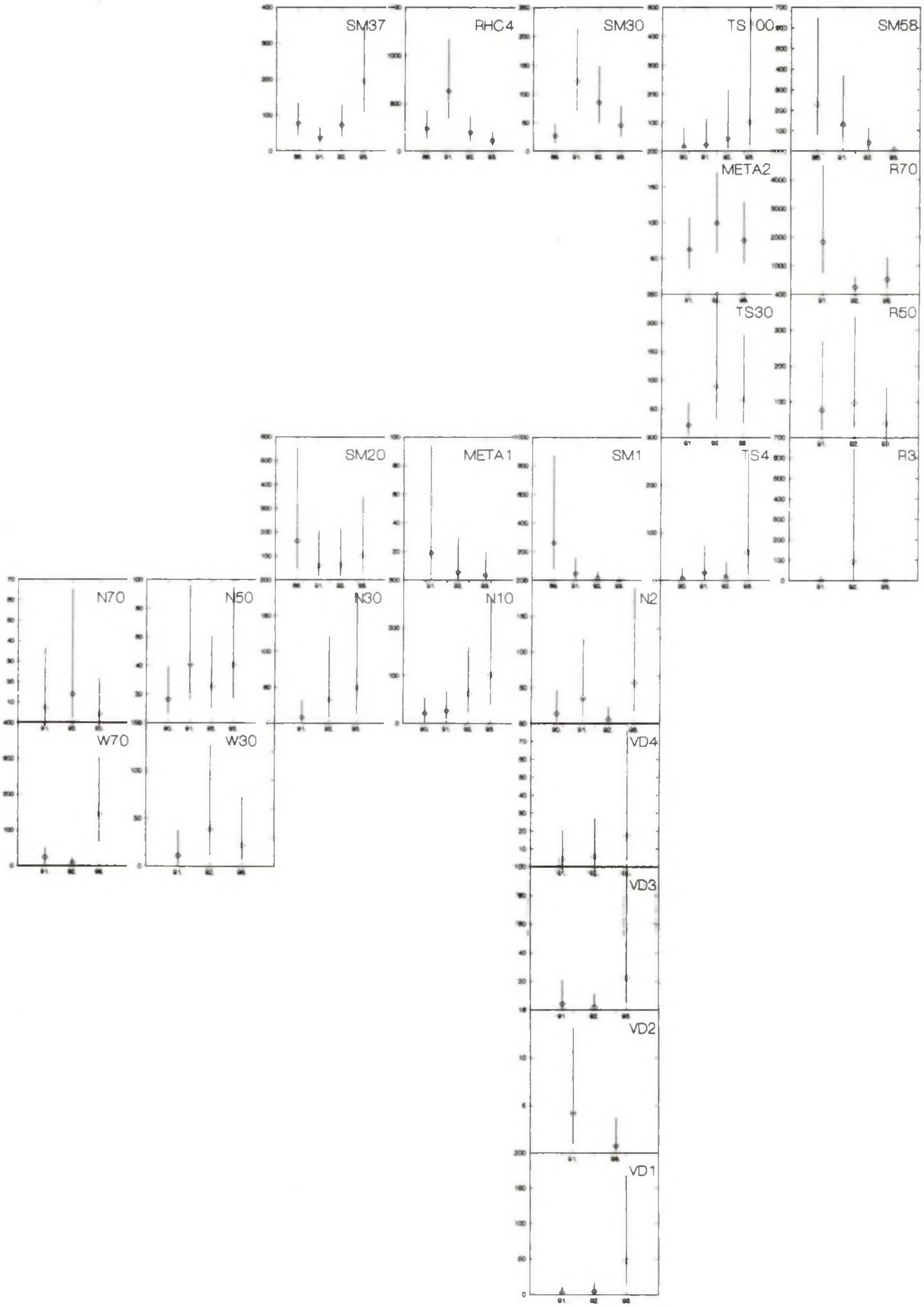

Fig. 51. Comparison plots with the density of the Miscellaneous species (ind./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

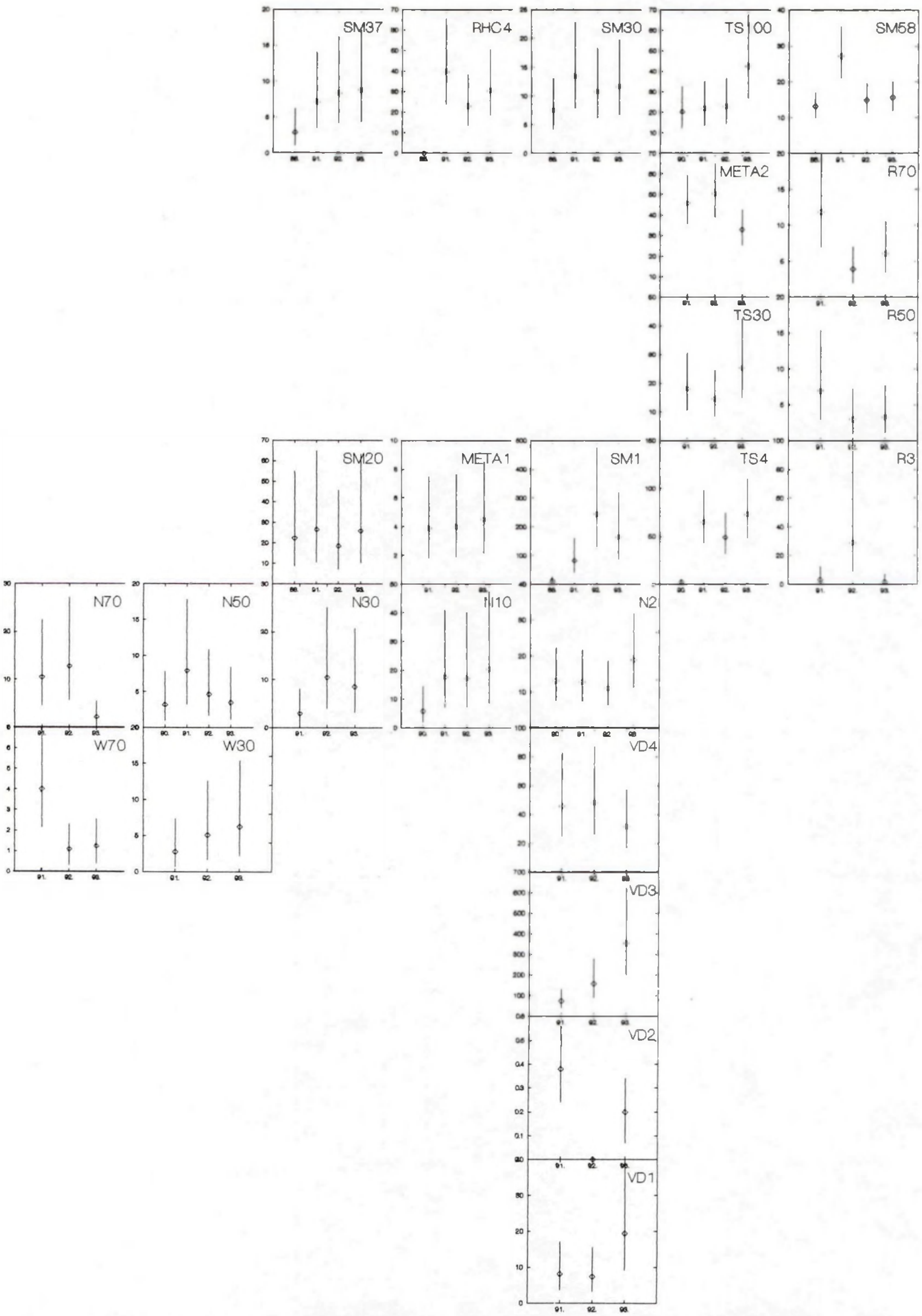

Fig. 5m. Comparison plots with the total biomass of the species (g.AFDW./m^2), for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

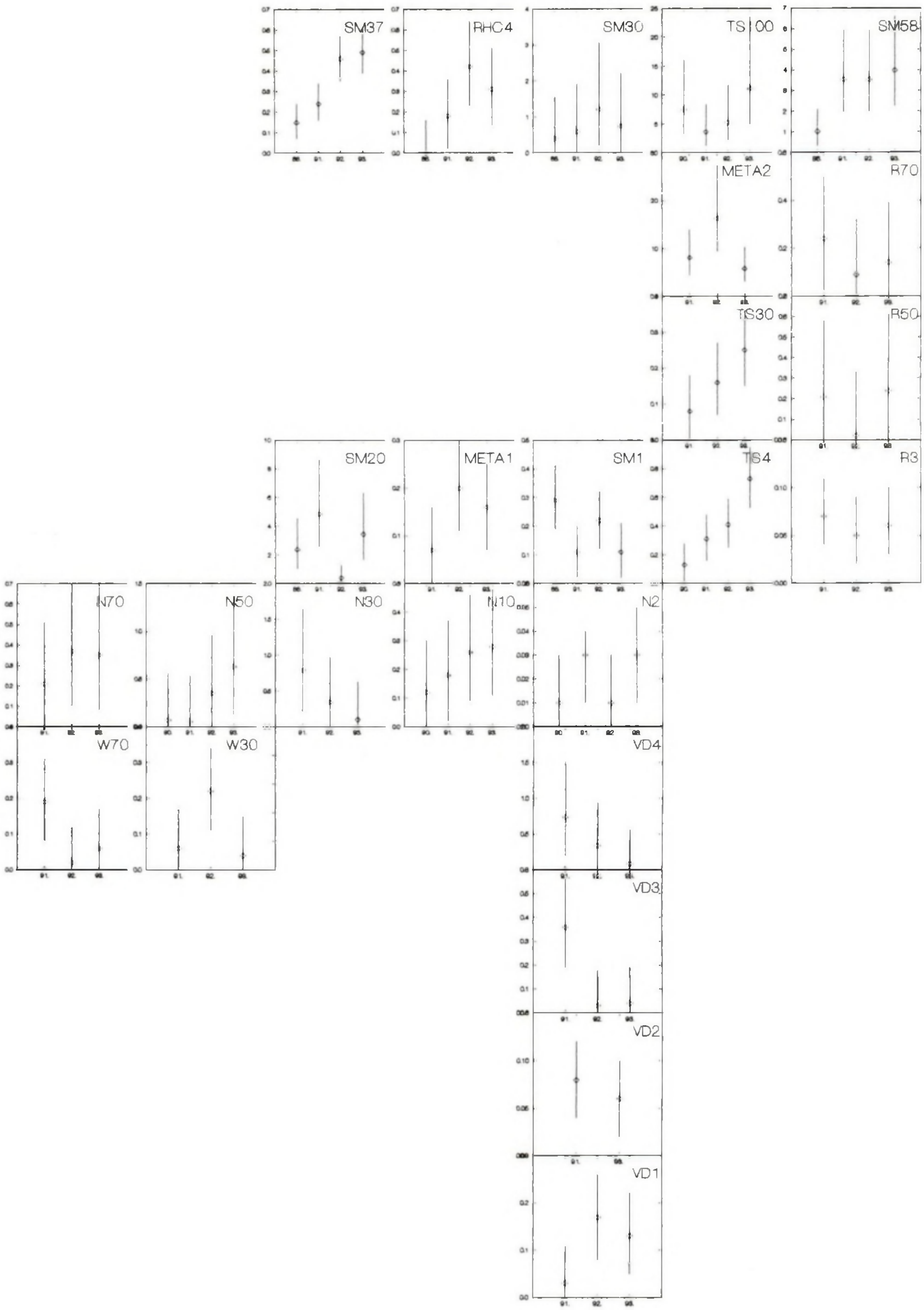

Fig. 5n. Comparison plots with the total biomass of the Crustaceans (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

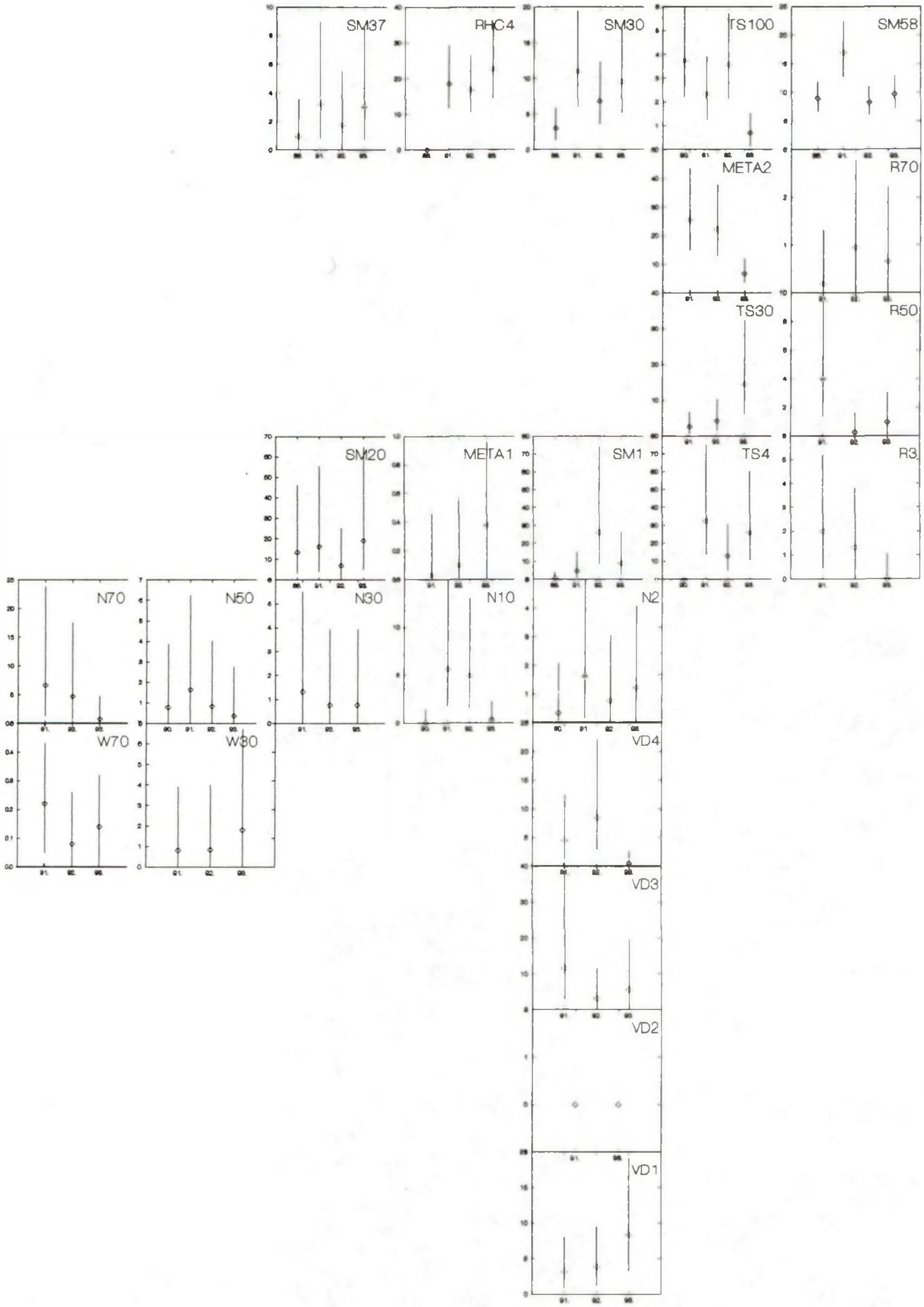

Fig. 5o. Comparison plots with the total biomass of the Echinoderms (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

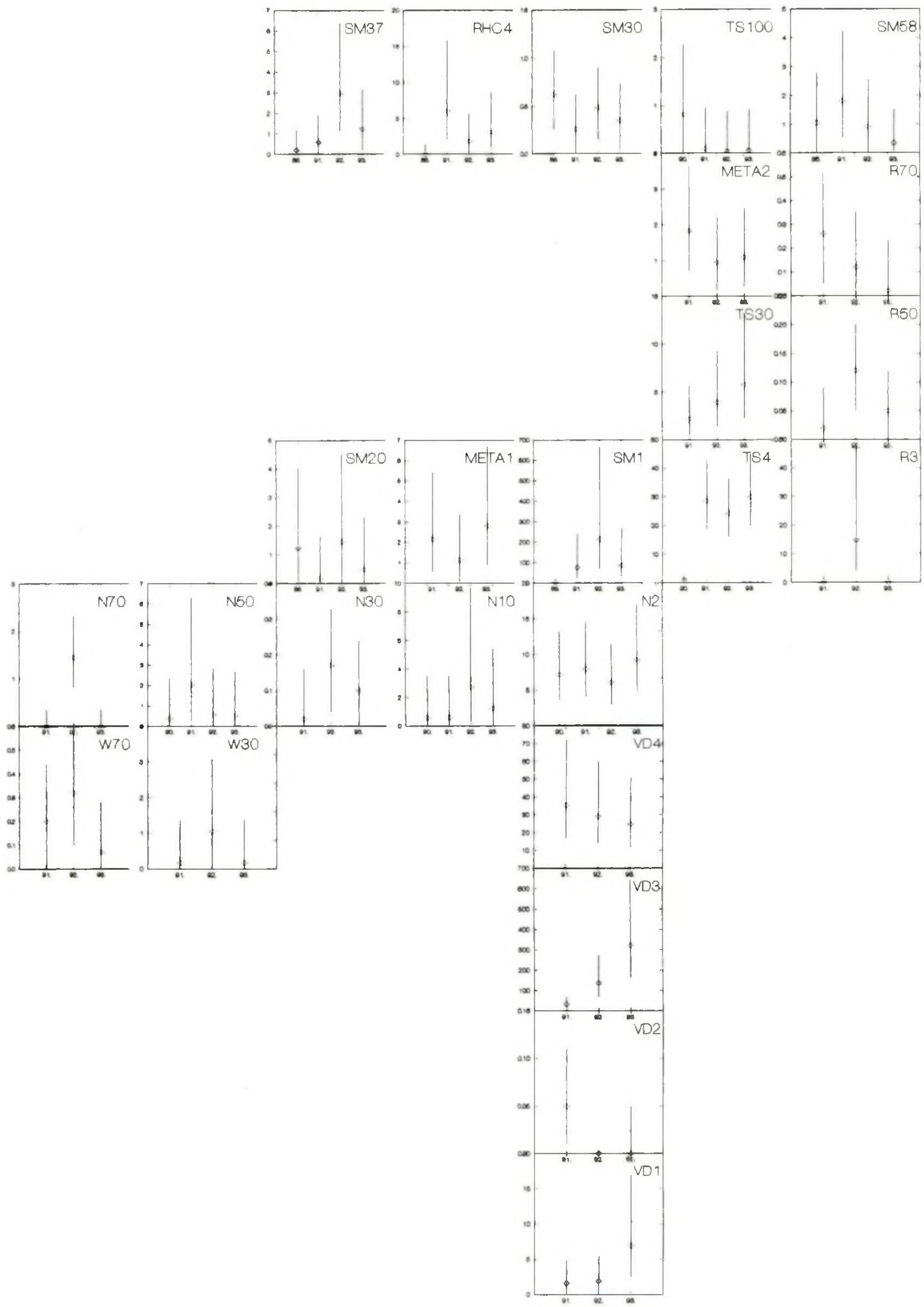

Fig. 5p. Comparison plots with the total biomass of the Molluscs (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

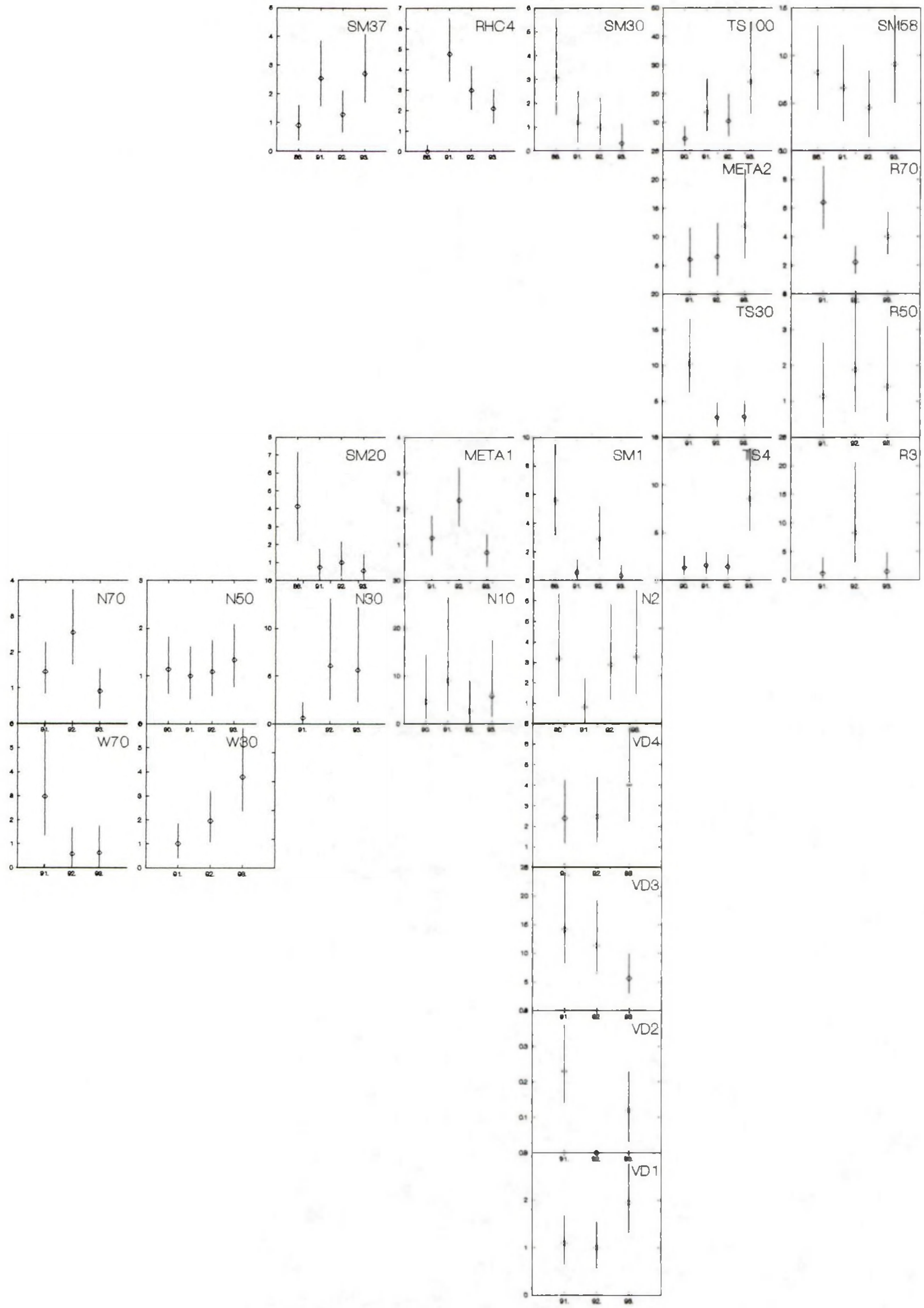

Fig. 5q. Comparison plots with the total biomass of the Polychaetes (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

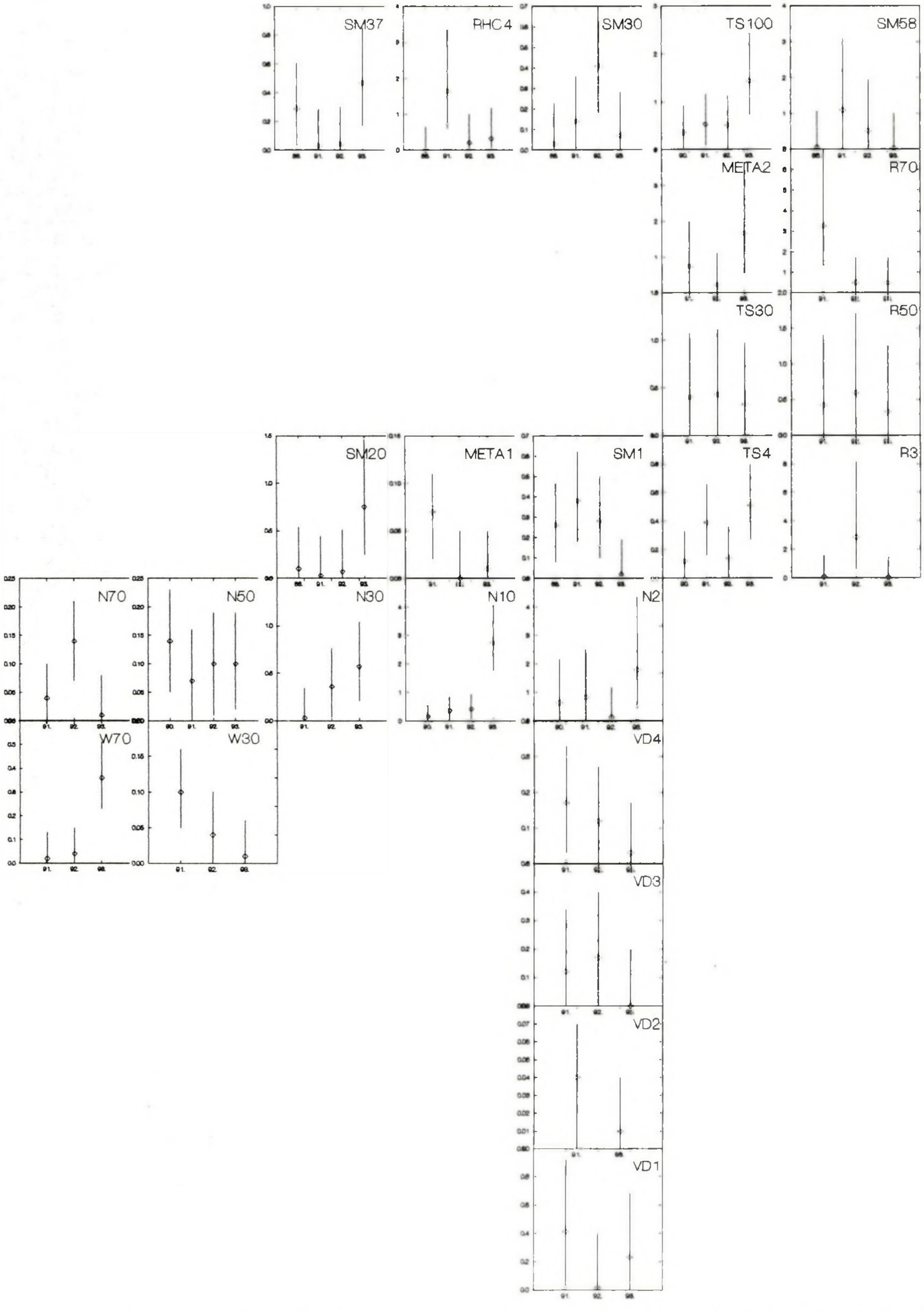

Fig. 5r. Comparison plots with the total biomass of the Miscellaneous species (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

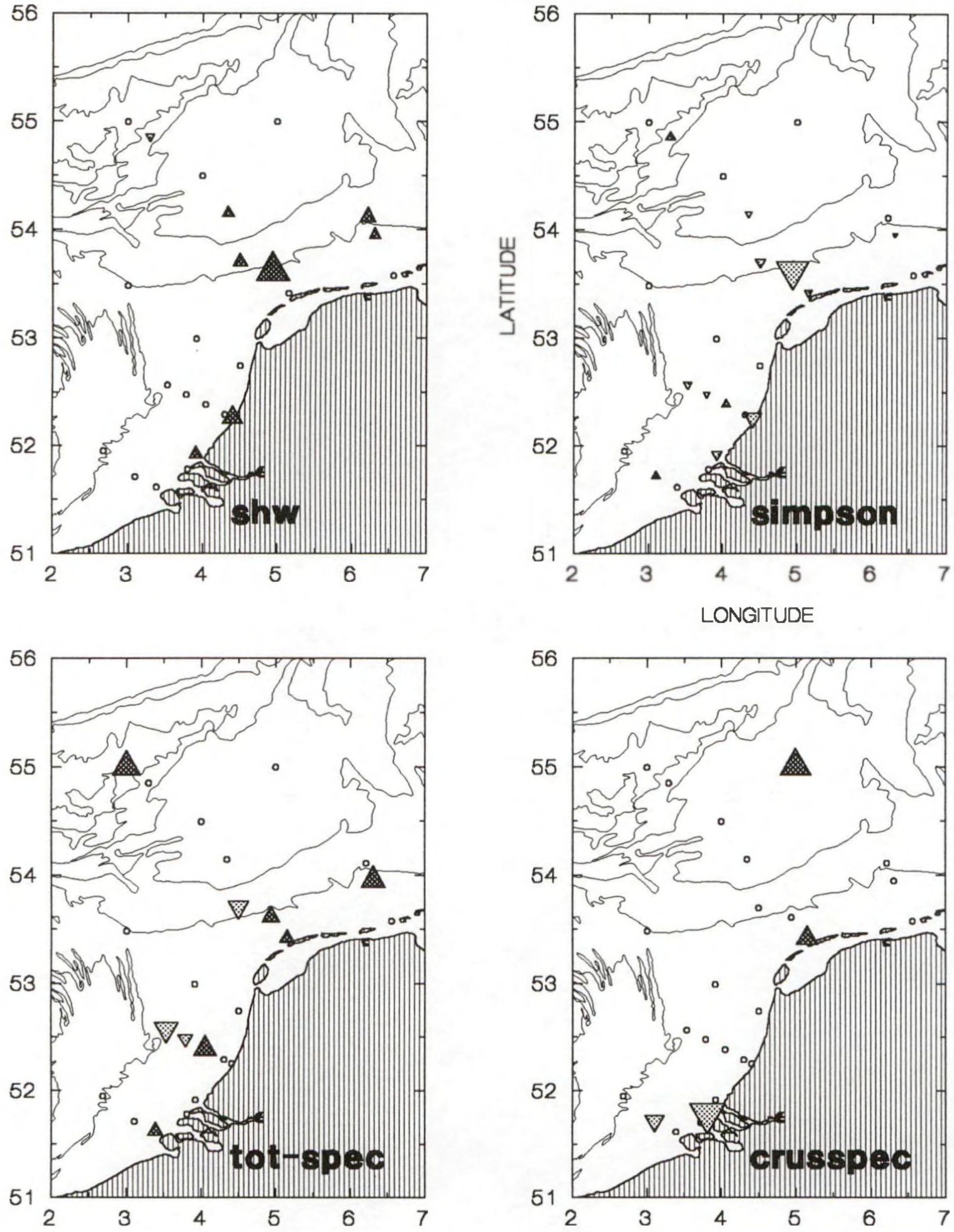

Fig. 6a. Trend-like changes in community atributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ₒ indicates no significant trend.

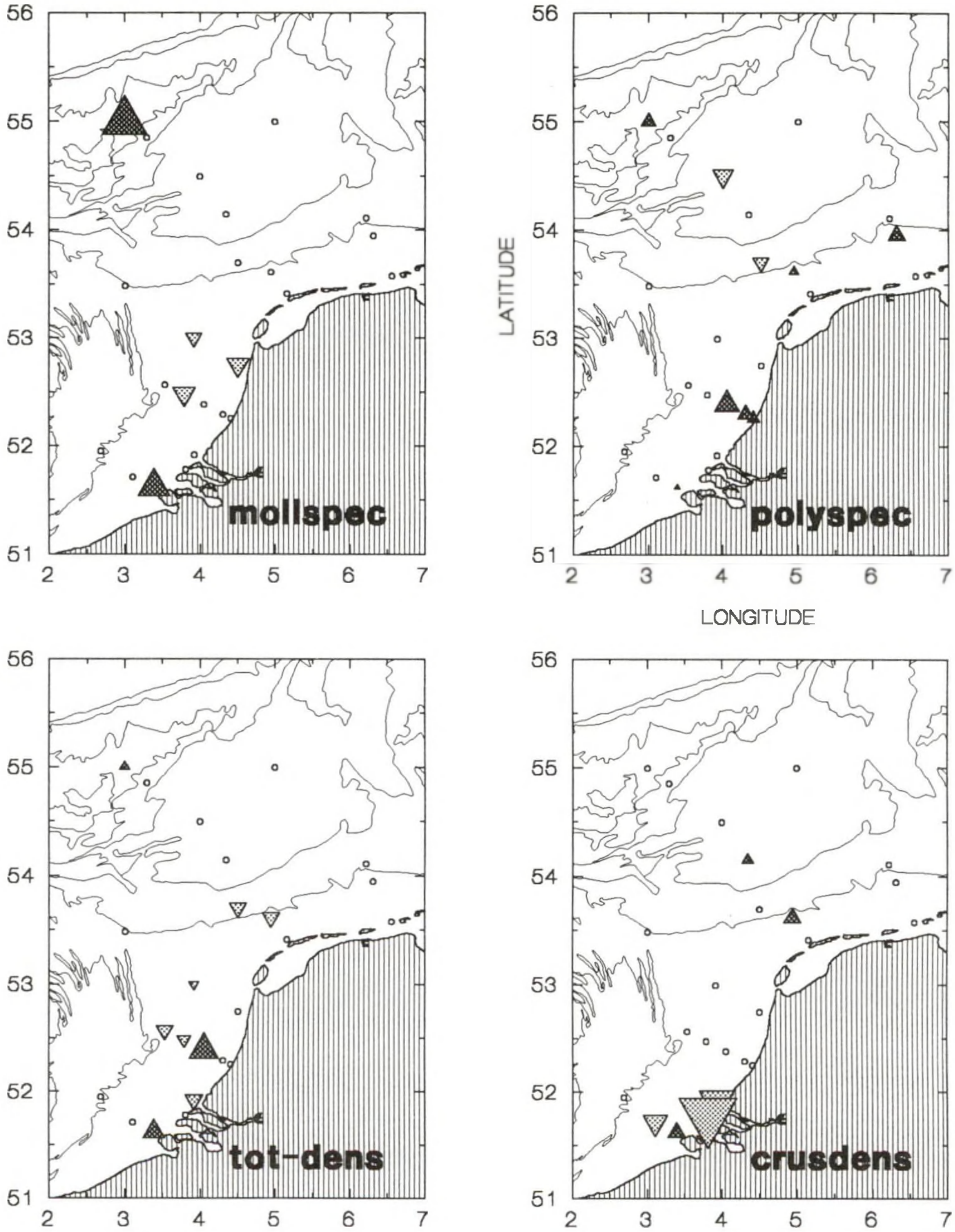

Fig. 6b. Trend-like changes in community atributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol o indicates no significant trend.

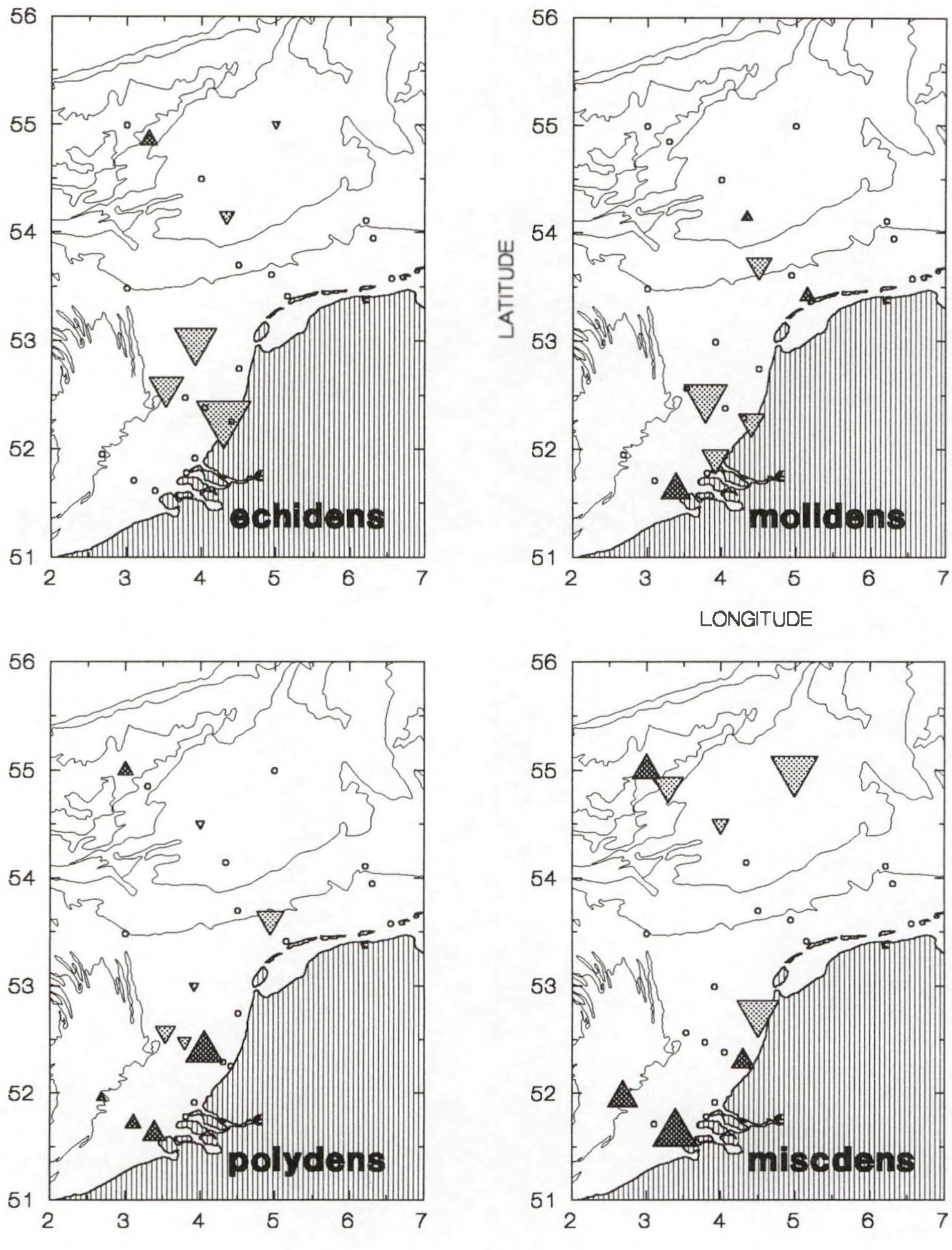

Fig. 6c. Trend-like changes in community atributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol o indicates no significant trend.

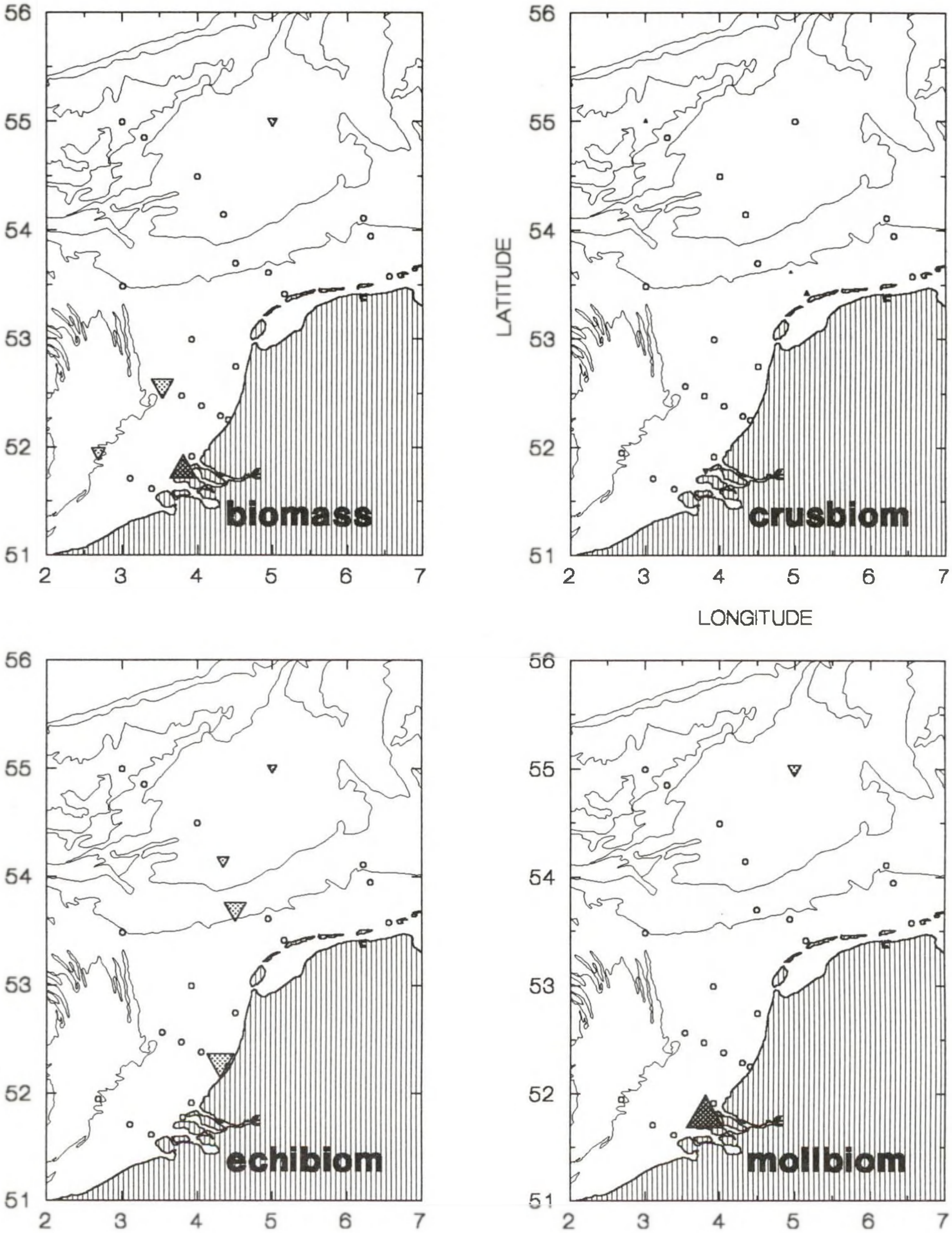

Fig. 6d. Trend-like changes in community atributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol o indicates no significant trend.

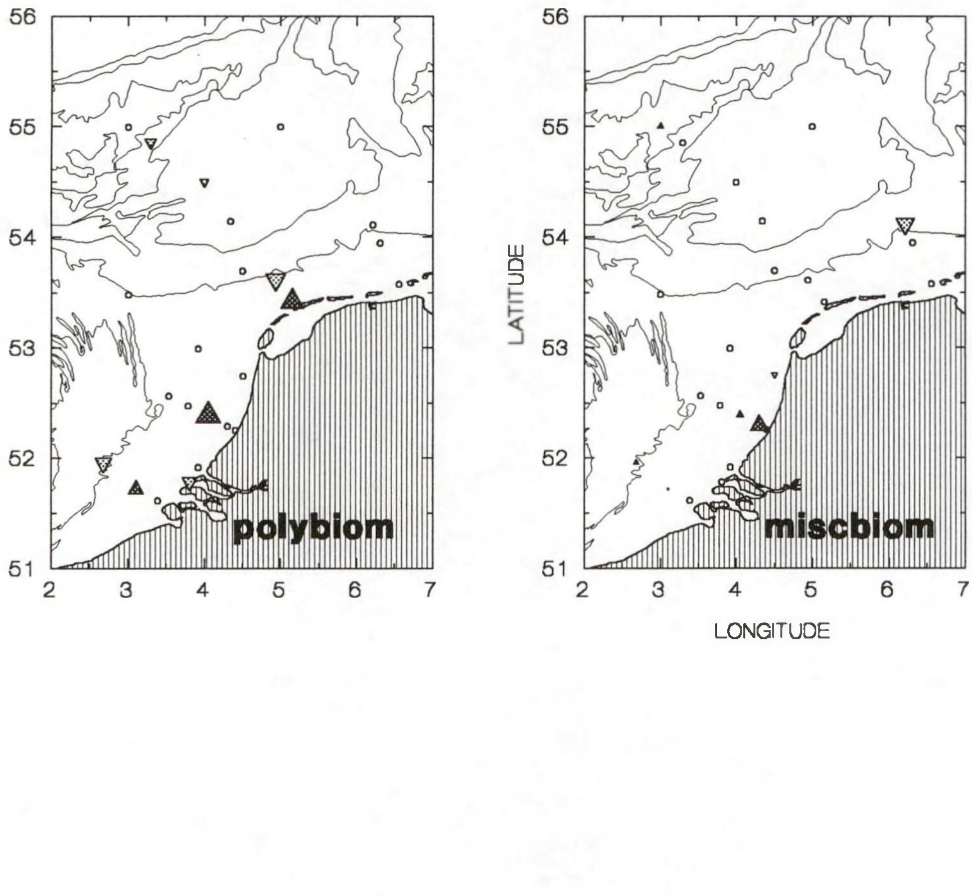

Fig. 6e. Trend-like changes in community atributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol o indicates no significant trend.

Table 5. Overview of differences and trends in produktion of the community and phyla. Results for single stations pertain to the period 1991-1993, those for station groups also for extended periods of time(indicated in the second column). ░ indicates a significant difference among the mean densities of the studied years(c.f. Fig. 7a-e). The symbols > and < respectively stand for an upward or downward trend in this period(c.g. Fig. 8). Double arrows(> >) indicate that the trend remains significant over the extended time period, viz. 1990-1993 for stations TS4, TS100, N2, N10, N50, and 1986-1993 for stations SM30, RHC4, SM58, SM1, SM20 and SM37.

STATION	PERIOD	TOT-PROD	CRUSPROD	ECHIPROD	MOLLPROD	POLYPROD	MISCPROD	CLUSTER
META2	91-93			░ <	░ <			OYSTER 1
TS100	91-93		░ >>	░ <				
oyster1 cluster	90-93						>	
oyster1 cluster	91-93					>	>	
SM30	91-93					<		OYSTER 2
RHC4	91-93					<		
SM58	91-93			░ <	<			
oyster2 cluster	91-93		░ >					
R3	91-93							COASTAL
TS4	91-93					░ >		
TS30	91-93		>	>		░ <		
SM1	91-93						░ <	
N2	91-93							
N10	91-93						░ >>	
VD4	91-93		░ <					
VD3	91-93	░ >	░ <		░ >	░ <		
VD1	91-93							
coastal cluster	90-93							
coastal cluster	91-93							
R50	91-93							OFFSHORE
R70	91-93	░				░		
META1	91-93					░		
SM20	91-93		░					
N30	91-93					░ >	>	
N50	91-93							
N70	91-93	░			░	░		
VD2	91-93							
W30	91-93					░ >	<	
W70	91-93						░ >	
SM37	91-93		>				░ >	
offshore cluster	90-93							
offshore cluster	91-93							

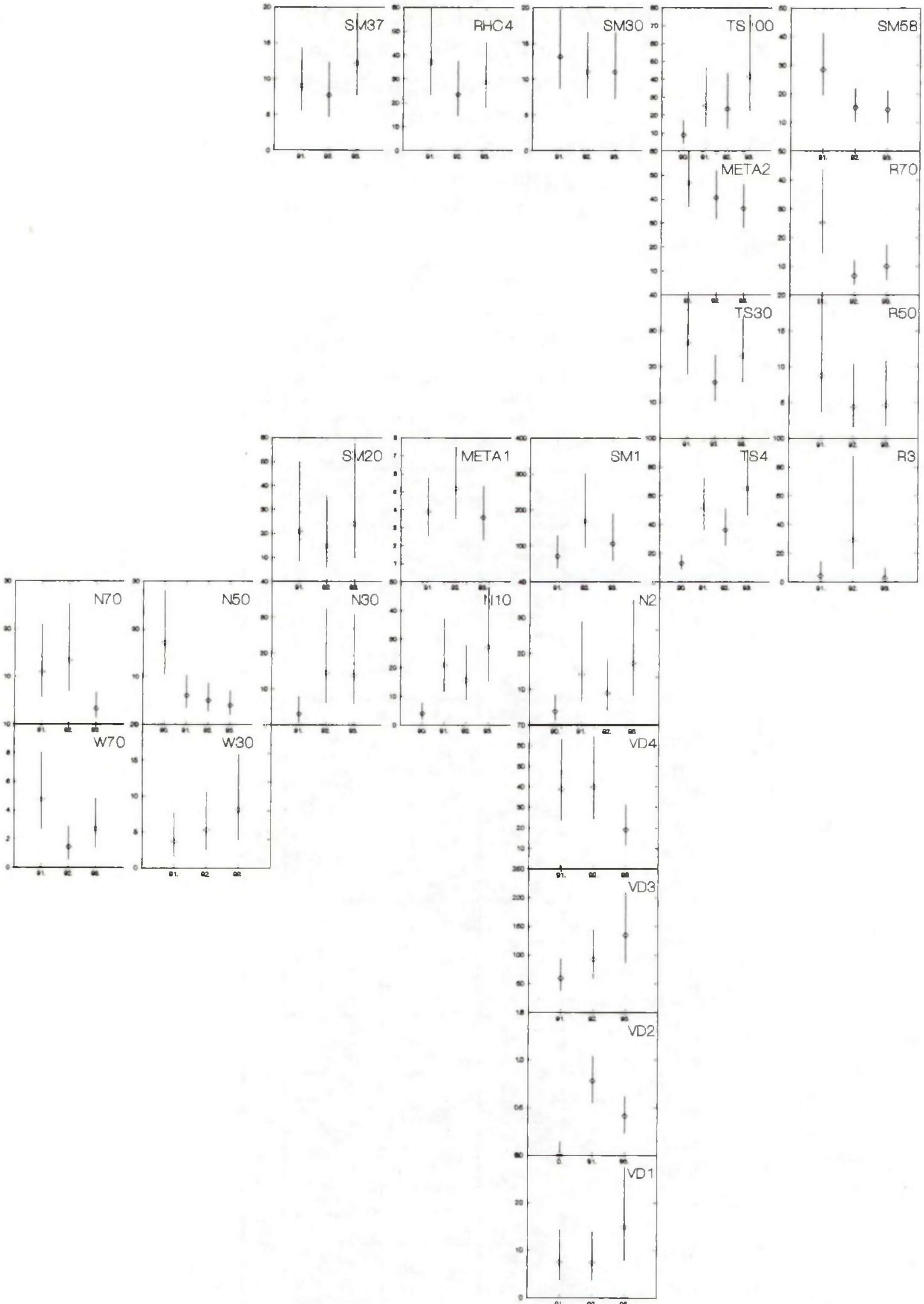

Fig. 7a. Comparison plots with the total production of the species (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

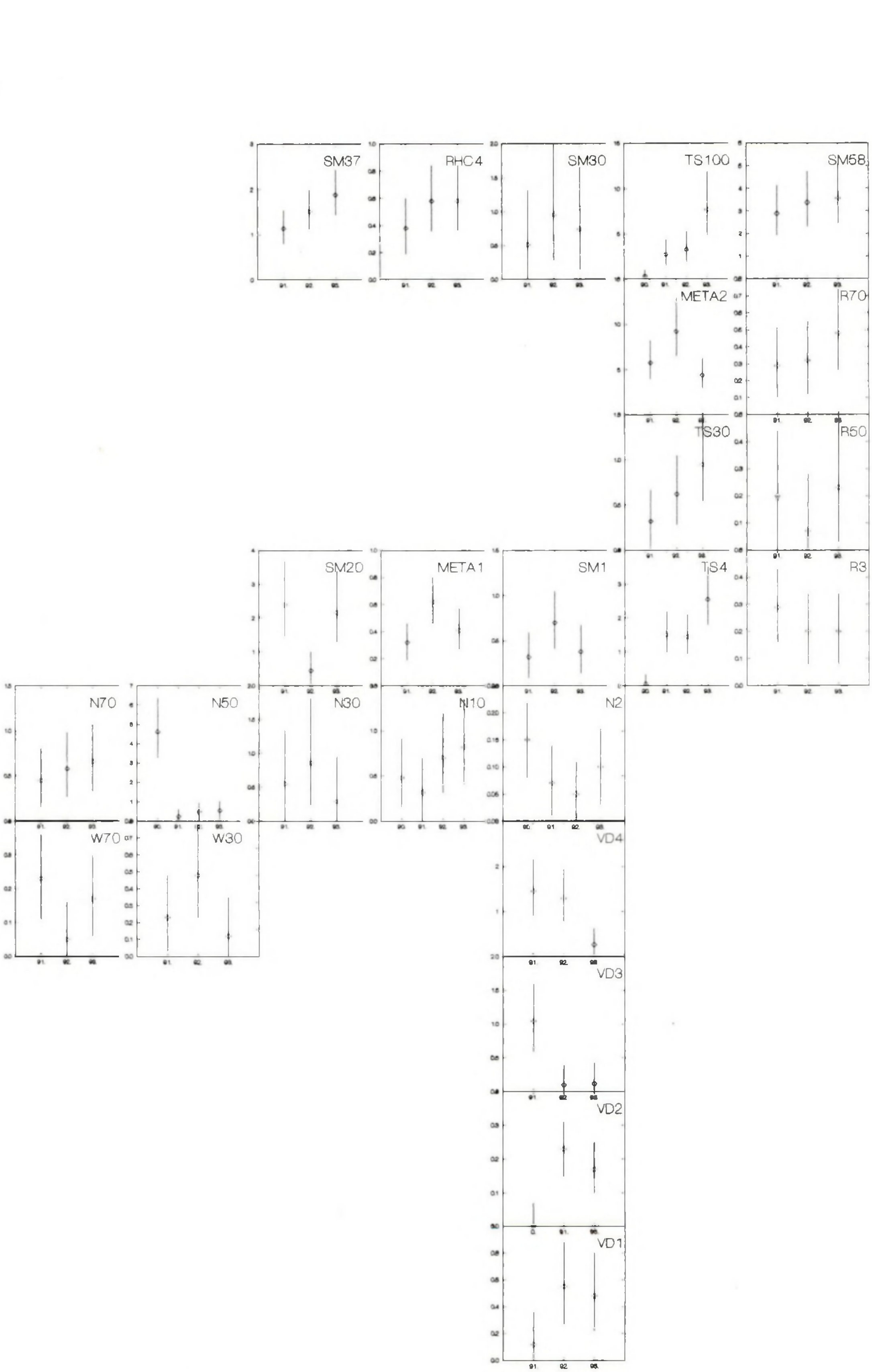

Fig. 7b. Comparison plots with the total production of the Crustaceans (g.AFDW./m^2), for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

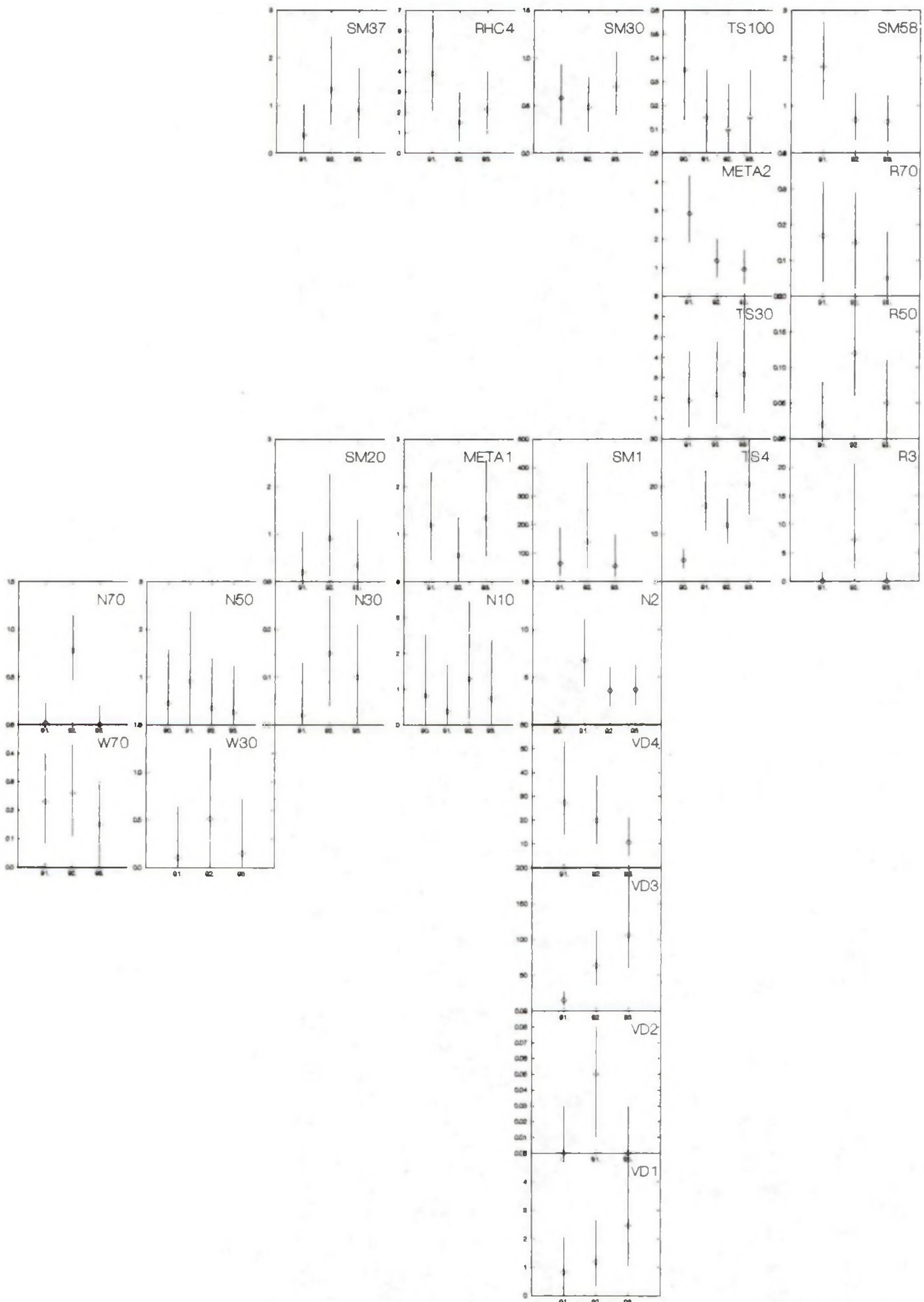

Fig. 7c. Comparison plots with the total production of the Molluscs (g.AFDW./m^2), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

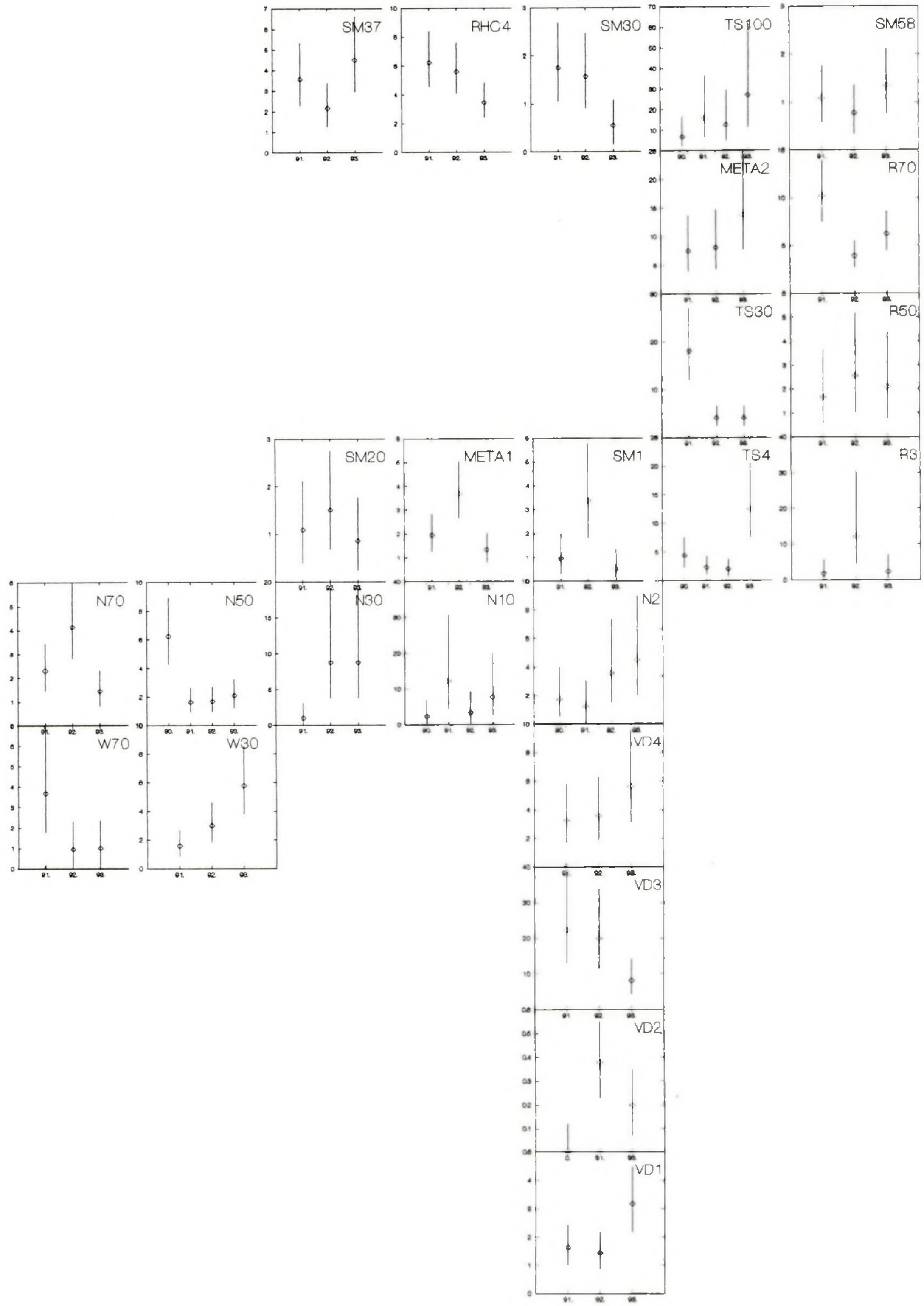

Fig. 7d. Comparison plots with the total production of the Polychaetes (g.AFDW./m^2), for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

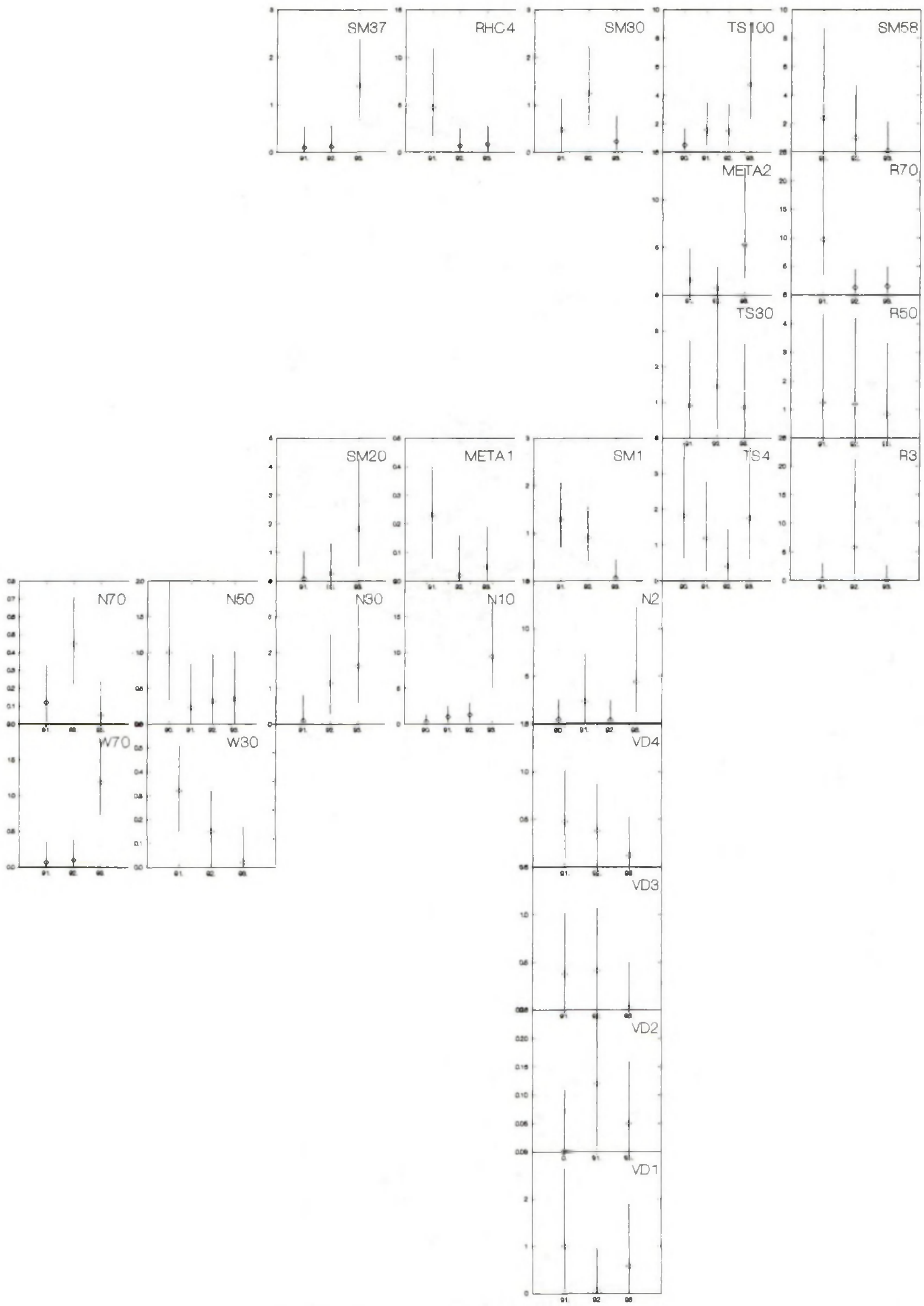

Fig. 7e. Comparison plots with the total production of the Miscellaneous species (g.AFDW./m^2), for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

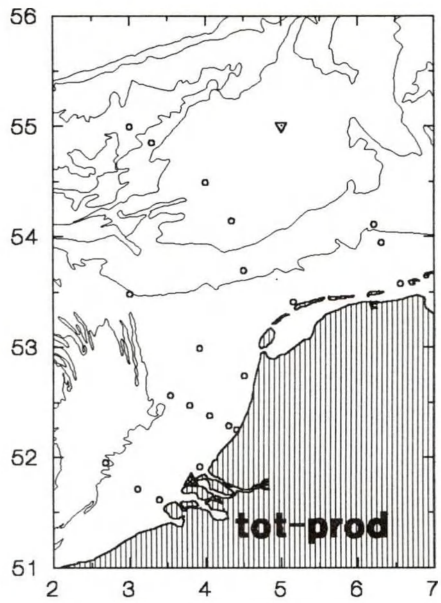

Fig. 8. Trend-like changes in total produktion of the species at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively a increasing and decreasing trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ₒ indicates no significant trend.

Appendix - 1 Biomonitoring 1993

NOTE

Occurrences of the species that were collected during the Biomonitoring 1993-survey. The left-hand column shows the abbreviated species names as have been used in Appendix-2. The corresponding full latin names are shown in the right-hand column.

Appendix - 1 Biomonitoring 1993

	R30	R50	R70	SM58	TS4	TS30	META2	TS10	SM30	RHC4	SM37	SM1	META1	SM20	N2	N10	N30	N50	N70	VD4	VD3	VD2	VD1	W30	W70	
ABRA ALBA	-	+	+	+	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	ABRA ALBA
ABRA NITI	-	-	-	+	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	+	ABRA NITIDA
ABRA PRIS	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ABRA PRISMATICA
ACRO BRAC	+	-	+	-	-	+	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+	ACROCNIDA BRACHIATA
ACTA TORN	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ACTAEON TORNATILUS
AMPE BREV	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	AMPELISCA BREVICORNIS
AMPE DIAD	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AMPELISCA DIADEMA
AMPE TENU	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AMPELISCA TENUICORNIS
AMPH FILI	-	-	+	+	-	-	+	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	AMPHIURA FILIFORMIS
AMPHIURI	-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	AMPHIURA JUVENILE
ANAI MACU	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	+	+	-	-	-	+	-	-	+	+	ANAITIDES MACULATA
ANAI MUCO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	ANAITIDES MUCOSA
ANAI SUBU	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	ANAITIDES SUBULIFERA
ANTH OZOA	-	-	+	-	+	+	-	-	+	+	+	-	+	+	+	-	-	-	-	+	-	-	-	+	-	ANTHOZOA INDET.
AONI PAUC	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AONIDES PAUCIBRANCHIATA
AORI DAE	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AORIDAE INDET.
APHR ACUL	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	APHRODITA ACULEATA
ARCT ISLA	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ARCTICA ISLANDICA
ARGI HAMA	-	+	+	-	-	-	-	+	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	ARGISSA HAMATIPES
ARIC JEFF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	ARICIDEA JEFFREYSII
ARIC MINU	-	-	-	+	-	-	-	-	+	-	+	-	+	-	-	-	+	+	+	-	-	-	-	+	+	ARICIDEA MINUTA
ASTA TRIA	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ASTARTE TRIANGULARIS
ATYL FALC	+	+	-	-	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	+	ATYLUS FALCATUS
ATYL SWAM	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	-	-	+	-	-	-	-	-	+	ATYLUS SWAMMERDAMI
BATH ELEG	+	+	+	+	+	+	+	-	-	-	+	-	+	-	-	-	-	+	+	-	+	-	+	-	-	BATHYPOREIA ELEGANS
BATH GUIL	-	-	+	-	+	+	-	-	-	-	+	+	+	-	-	+	+	+	+	+	-	+	+	+	+	BATHYPOREIA GUILLIAMSONIANA
BATH TENU	-	-	+	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	BATHYPOREIA TENUIPES
BIVA LVIA	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	BIVALVIA INDET.
BODO SCOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	BODOTRIA SCORPIOIDES
BRAN LANC	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	BRANCHIOSTOMA LANCEOLATUM
BRIS LYRI	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	BRISSOPSIS LYRIFERA
CALL SUBT	-	-	+	+	-	-	+	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	CALLIANASSA SUBTERRANEA
CALL TYRR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	CALLIANASSA TYRRHENA
CAPI CAPI	-	-	-	-	+	-	-	-	-	+	-	+	-	-	+	+	+	-	-	+	+	-	-	-	-	CAPITELLA CAPITATA
CAPI TELL	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CAPITELLIDAE INDET.
CAPR ELLI	-	+	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	CAPRELLIDAE INDET.
CAUL SPEC	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CAULLERIELLA SPEC.
CHAE SETO	-	-	+	+	-	+	-	+	+	+	+	-	+	+	+	-	-	-	-	+	-	-	-	-	-	CHAETOZONE SETOSA
CHAE VARI	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CHAETOPTERUS VARIOPEDATUS
CING VITR	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CINGULA VITREA
CIRR CIRR	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CIRRATULUS CIRRATUS
CORB GIBB	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CORBULA GIBBA
CORO AFFI	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	COROPHIUM AFFINE
CUCU ELON	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CUCUMARIA ELONGATA
CULT PELL	-	-	-	+	-	+	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	CULTELLUS PELLUCIDUS
CUMACEA	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CUMACEA INDET.
CYLI CYLI	-	-	+	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CYLICHNA CYLINDRACEA
DEVO PERR	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DEVONIA PEIRREIRI
DIAS BRAD	-	-	+	+	+	+	+	+	+	-	+	+	-	-	+	+	-	+	-	-	+	-	-	-	-	DIASTYLIS BRADYI
DIPL GLAU	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DIPLOCIRRUS GLAUCUS
DONA VITT	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	DONAX VITTATUS
DOSI LUPI	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DOSINIA LUPINUS
EBAL CRAN	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EBALIA CRANCHII
EBAL SPEC	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EBALIA INDET.
ECHI CORD	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	ECHINOCARDIUM CORDATUM
ECHI FLAV	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ECHICARDIUM FLAVESCENS
ECHI PUSI	-	+	+	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	+	ECHICYAMUS PUSILLUS
ENSI DIRE	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	+	+	-	+	-	-	ENSIS DIRECTUS
ENSI ENSI	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	ENSIS ENSIS
ETEO LACT	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	ETEONE LACTEA
ETEO LONG	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	ETEONE LONGA
EUDO DEFO	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EUDORELLOPSIS DEFORMIS
EUDO TRUN	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EUDORELLA TRUNCATULA
EULI ALBA	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EULIMA ALBA
EUMI SANG	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	EUMIDA SANGUINEA
EUNI CIDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	EUNICIDAE INDET.
EXOG HEBE	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	EXOGONE HEBES
EXOG NAID	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	EXOGONE NAIDINA
EXOG SPEC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	EXOGONE SPEC.
GAMM SPEC	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GAMMARUS PEC.
GARI FERV	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GARI FERVENSIS
GATT CIRR	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GATTYANA CIRROSA
GLYC ALBA	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GLYCERA ALBA
GLYC JUV	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GLYCERA JUVENILE
GLYC LAPI	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	GLYCERA LAPIDUM
GLYC NORD	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GLYCINDE NORDMANNI
GLYC ROUX	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GLYCERA ROUXI
GOLF ELON	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GOLFINGIA ELONGATA
GOLF PROC	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GOLFINGIA PROCERA
GOLF VULG	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GOLFINGIA VULGARIS
GONI BOBR	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GONIADELLA BOBRETZKI
GONI MACU	-	-	+	-	-	+	-	+	-	+	+	-	+	+	-	-	-	-	+	-	-	-	-	-	-	GONIADA MACULATA
GYPT CAPE	-	-	-	-	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GYPTIS CAPENSIS
HARMJUV	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	HARMOTHOE JUVENILE
HARMLONG	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	HARMOTHOE LONGISETIS
HARMLUNU	-	-	+	-	+	-	-	-	-	+	+	+	-	-	+	+	-	-	-	-	+	-	-	-	-	HARMOTHOE LUNULATA
HARP ANTE	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	HARPINIA ANTENNARIA
HARP CREN	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	HARPINIA CRENULATA
HARP PECT	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	HARPINIA PECTINATA
HESI AUGE	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	HESIONURA AUGENERI

Appendix - 1 Biomonitoring 1993

	R30	R50	R70	SM58	TS4	TS30	META2	TS10	SM30	RHC4	SM37	SM1	META1	SM20	N2	N10	N30	N50	N70	VD4	VD3	VD2	VD1	W30	W70	
HETE FILI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	HETEROMASTUSFILIFORMIS
HIPP DENT	-	+	+	+	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	HIPPOMEDONDENTICULATUS
IONE THOR	-	-	-	+	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	IONE THORACIA
IPHI TRIS	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	IPHINOE TRISPINOSA
LANI CONC	-	+	+	+	+	-	-	-	-	+	+	-	-	-	+	+	-	+	-	+	+	-	+	-	-	LANICE CONCHILEGA
LEPT INHA	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LEPTOSYNAPTAINHAERENS
LEPT SQUA	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LEPTON SQUAMOSUM
LEUC INCI	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	LEUCOTHOEINCISA
LEUC LILL	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LEUCOTHOELILLJEBORGI
LEUC RICH	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LEUCOTHOERICHARDI
LUCI BORE	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LUCINOMABOREALIS
LUMBLATR	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LUMBRINERIS LATREILLI
LUMBPSEU	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LUMBRINERIS PSEUDOFRAGILIS
MACOBALT	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	MACOMABALTTHICA
MACTCORA	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	MACTRACORALLINA
MAGEALLE	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MAGELONAALLENI
MAGEPAPI	+	+	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	MAGELONAPAPILLICORNIS
MALDANID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	MALDANIDAEINDET.
MEDI GRAC	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MEDIOMASTUSGRACILIS
MEGAAGIL	-	+	-	-	-	+	-	-	-	-	+	-	+	-	-	-	+	+	+	-	-	-	-	+	+	MEGALUROPUSAGILIS
MENI OBTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	MENIGRATESOBTUSIFRONS
MICR MACU	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	MICROPROTOPUSMACULATUS
MONTFERR	+	-	+	+	+	+	+	-	+	+	+	+	-	+	+	+	-	-	-	+	+	-	+	-	-	MONTACUTAFERRUGINOSA
MYA_AREN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	MYA ARENARIA
MYSE BIDE	-	-	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	+	+	+	+	-	+	MYSELLABIDENTATA
MYSI UNDA	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MYSIA UNDATA
NATI ALDE	-	+	+	+	-	+	+	+	-	+	+	+	+	+	-	-	+	+	-	+	-	-	-	+	+	NATICA ALDERI
NEMERTIN	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NEMERTINI
NEPH CAEC	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	NEPHTYS CAECA
NEPH CIRR	+	+	+	-	+	+	-	-	-	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	NEPHTYS CIRROSA
NEPH HOMB	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	+	+	-	+	-	-	NEPHTYS HOMBERGII
NEPH INCI	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NEPHYS INCISA
NEPH JUV	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NEPHTYS JUVENILE
NEPH LONG	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NEPHTYS LONGOSETOSA
NERE LONG	-	+	-	-	-	-	+	+	-	-	-	-	+	-	-	+	+	-	-	+	+	-	+	-	-	NEREIS LONGISSIMA
NOTO LATE	-	-	-	-	-	+	+	+	-	+	+	-	-	-	+	+	-	-	-	-	+	-	+	-	-	NOTOMASTUSLATERICEUS
NUCUTENU	-	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NUCULATENUIS
NUCUTURG	-	-	-	+	-	+	+	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	NUCULATURGIDA
OLIG OCHA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	+	-	+	OLIGOCHAETAINDET.
OPHE ACUM	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	OPHELINA ACUMINATA
OPHE LIMA	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	+	+	OPHELIA LIMACINA
OPHI ALBI	-	+	-	-	+	-	-	+	-	-	+	-	+	+	-	-	-	+	+	-	+	-	-	+	+	OPHIURA ALBIDA
OPHI FLEX	-	-	+	+	-	-	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	OPHIODROMUSFLEXUOSUS
OPIS PTER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	OPISTHODONTAPTEROCHAETA
ORBI SPEC	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ORBINIA SPEC.
OWENFUSI	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	OWENIA FUSIFORMIS
PARA FULG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	PARAONIS FULGENS
PARA GRAC	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PARAONIS GRACILIS
PECT AURI	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PECTINARIA AURICOMA
PECT KORE	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	PECTINARIA KORENI
PERI LONG	-	+	+	+	-	+	+	-	+	+	+	-	-	+	-	-	-	+	-	-	-	-	-	+	-	PERIOCULODES LONGIMANUS
PETA DECL	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PETALOSARSIA DECLIVES
PHIL SPEC	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PHILINE SPEC.
PHOL MINU	-	-	+	+	-	-	+	+	+	+	+	-	-	+	-	+	-	+	-	-	-	-	-	-	-	PHOLOE MINUTA
PHOR ONID	-	-	+	+	-	-	+	+	+	+	+	-	-	+	-	-	-	+	+	-	-	-	-	-	-	PHORONIDA INDET.
PISI REMO	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PISIONE REMOTA
PLAT WORM	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PLATWORM
POEC SERP	-	-	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	POECILOCHAETUSSERPENS
POLI EP	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	POLIEP
POLY SPEC	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	POLYDORASPEC.
PONT ALTA	+	+	+	-	+	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-	+	-	PONTOCRATESALTAMARINUS
PRIO CIRR	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	PRIONOSPIO CIRRIFERA
PROT KEFE	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PROTODORVILLEAKEFERSTEINI
PSAM MILI	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PSAMMECHINUSMILIARIS
PSEU LONG	+	-	+	+	+	+	-	+	+	+	+	-	+	-	-	+	+	+	+	+	-	-	+	+	+	PSEUDOCUMALONGICORNIS
PSEU SIMI	-	+	+	+	-	-	-	-	+	-	+	-	+	+	-	-	+	+	-	-	-	-	-	+	+	PSEUDOCUMASIMILIS
SCAL INFL	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SCALIBREGMAINFLATUM
SCOL ARMI	-	-	-	+	+	+	-	-	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+	+	+	SCOLOPLOS ARMIGER
SCOL BONN	-	+	+	+	+	-	-	-	-	+	+	+	+	-	+	-	+	+	-	-	-	+	+	+	+	SCOLELEPIS BONNIERI
SCOL SQUA	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-	+	+	SCOLELEPIS SQUAMATA
SIGA MATH	-	-	+	+	-	+	-	-	+	+	+	-	-	+	-	+	-	-	-	+	-	-	-	-	-	SIGALIOM MATHILDAE
SIPH KROY	-	-	+	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SIPHONOECETES KROYERANUS
SPHA HYST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	SPHAEROSYLLIS HYTRIX
SPIO BOMB	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	SPIOPHANES BOMBYX
SPIO FILI	+	-	+	+	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	-	+	+	SPIO FILICORNIS
SPIO KROY	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SPIOPHANES KROYERI
SPIS ELLI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	SPISULA ELLIPTICA
SPIS SPEC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	SPISULA SPEC.
SPIS SUBT	-	-	-	-	+	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	+	-	+	-	-	SPISULA SUBTRUNCATA
STHE LIMI	-	-	+	+	-	-	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	STHENELAIS LIMICOLA
STRE WEBS	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	STREPTOSYLLIS WEBSTERI
SYNC MACU	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SYNCHELIDIUM MACULATUM
SYNE KLAT	-	-	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SYNELMIS KLATTI
TELL FABU	-	+	+	+	+	+	-	-	-	+	+	+	+	+	+	-	-	-	-	+	+	-	+	-	-	TELLINA FABULA
TELL PYGM	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	TELLINA PYGMEA
TELL SPEC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	TELLINA SPEC.
TELL TENU	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	-	-	TELLINA TENUIS
THAR MARI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	THARYXMARIONI
THIA SCUT	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	THIA SCUTELLATA
THRA CONV	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	THRACIA CONVEXA

Appendix - 1 Biomonitoring 1993

	R3	R50	R70	SM58	TS4	TS30	META2	TSI00	SM30	RHC4	SM37	SM1	META1	SM20	N2	N10	N30	N50	N70	VD4	VD3	VD2	VD1	W30	W70	
THRA PHAS	-	-	+	+	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	THRACIA PHASEOLINA
THYA FLEX	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	THYASIRA FLEXUOSA
TRAV FORB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	-	TRAVISIA FORBESI
TRYP SARS	-	-	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	TRYPHOSELLASARSI
TURR COMM	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TURITELLA COMMUNIS
TYPO LANG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	TYPOSYLLIS LANGERHANSIA
UNCI PLAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	UNCIOLA PLANIPES
UPOG DELT	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	UPOGEBIA DELTAURA
UPOG STEL	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	UPOGEBIA STELLATA
UROT BREV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	+	-	UROTHOEBREVICORNIS
UROT POSE	-	-	+	-	+	+	-	-	-	-	+	+	+	-	+	+	+	+	+	+	+	+	+	-	-	UROTHOEPOSEIDONIS
VENE SENE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	VENERUPIS SENGALENSIS
VENU STRI	-	-	-	+	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	VENUS STRIATULA
No. Spec.	14	44	48	48	32	38	50	68	50	70	64	24	30	34	29	32	27	32	21	26	33	9	23	31	43	

Appendix - 2 Biomonitoring 1993

NOTE

Explanation of abbreviations in the tables:

N = Number of individuals per m^2
B = Biomass in g AFDW.m^{-2}
S.D. = Sample standard deviation
5 = Sum of densities per boxcore
NSPC = Number of species per boxcore
SH-W = Shannon-Wiener index of diversity in bits/ind.
SIMP = Simpson's index of dominance

All species names have been abbreviated by the first four characters of the generic name and the first four characters of the specific name. For full latin names, see Appendix-1.

Station index:

STATION : R3
GEOGR. POS. : 53° 33" 98' N 06° 33" 92" E
DATE : 06/05/93
DEPTH m : 11
Median Grain: 163.15
Perc. Mud. : 2.26

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLFALC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHELEG	29.3	0.013	14.6	0.012	14.6	0.016	117.0	0.056	87.8	0.053	52.7(	47.0)	0.030(	0.022)
PONTALTA	29.3	0.012	87.8	0.053	29.3	0.015	29.3	0.015	58.5	0.023	46.8(	26.2)	0.023(	0.017)
PSEULONG	0.0	0.000	29.3	0.015	14.6	0.007	14.6	0.007	43.9	0.022	20.5(	16.7)	0.010(	0.008)
ECHINODERMATA														
ACROBRAC	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MOLLUSCA														
MACOBALT	0.0	0.000	0.0	0.000	14.6	0.012	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
MONTFERR	14.6	0.026	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.005(	0.012)
TELLTENU	0.0	0.000	0.0	0.000	14.6	0.127	14.6	0.000	0.0	0.000	5.9(	8.0)	0.025(	0.057)
POLYCHAETA														
MAGEPAPI	160.9	0.361	14.6	0.035	87.8	0.354	204.8	0.475	146.3	0.246	122.9(	73.6)	0.294(	0.166)
NEPHCIRR	131.7	0.911	146.3	0.768	146.3	0.707	175.6	1.709	131.7	1.350	146.3(	17.9)	1.089(	0.428)
NEPHHOMB	43.9	0.391	0.0	0.000	14.6	0.357	0.0	0.000	0.0	0.000	11.7(	19.1)	0.150(	0.205)
NEPHLONG	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.031	2.9(	6.5)	0.006(	0.014)
SPIOFILI	14.6	0.016	29.3	0.007	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.005(	0.007)
MISCELLANEOUS														
NEMERTIN	0.0	0.000	0.0	0.000	14.6	0.196	0.0	0.000	0.0	0.000	2.9(	6.5)	0.039(	0.088)
5	438.9	1.731	321.9	0.890	351.1	1.791	570.6	2.269	482.8	1.725	433.0(	100.6)	1.681(	0.497)
NSPC	8		6		9		7		6					
SH-W	1.661		1.430		1.713		1.490		1.606					
SIMP	0.221		0.268		0.221		0.251		0.199					

STATION : R50
GEOGR. POS. : 53° 57" 24' N 06° 18" 65' E
DATE : 06/05/93
DEPTH m : 31
Median Grain: 352.28
Perc. Mud. : 0.90

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ARGIHAMA	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	14.6	0.007	5.9(	8.0)	0.003(	0.004)
ATYLFALC	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.026	8.8(	13.1)	0.007(	0.011)
BATHELEG	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
CAPRELLI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
HIPPDENT	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	14.6	0.007	5.9(	8.0)	0.003(	0.004)
IPHITRIS	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.013	2.9(	6.5)	0.003(	0.006)
MEGAAGIL	14.6	0.007	14.6	0.007	14.6	0.007	0.0	0.000	0.0	0.000	8.8(	8.0)	0.004(	0.004)
PERILONG	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
PONTALTA	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEUSIMI	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.015	14.6	0.007	8.8(	13.1)	0.004(	0.007)
THIASCUT	0.0	0.000	0.0	0.000	14.6	1.522	0.0	0.000	0.0	0.000	2.9(	6.5)	0.304(	0.680)
ECHINODERMATA														
AMPHIURI	29.3	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.000(	0.000)
ECHICORD	0.0	0.000	14.6	2.821	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.564(	1.261)
ECHIPUSI	58.5	0.070	87.8	0.145	73.2	0.088	190.2	0.331	43.9	0.023	90.7(	58.0)	0.131(	0.120)
OPHIALBI	117.0	0.094	73.2	0.139	14.6	0.000	0.0	0.000	87.8	0.102	58.5(	49.6)	0.067(	0.063)
PSAMMILI	43.9	3.023	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	19.6)	0.605(	1.352)
MOLLUSCA														
ABRAALBA	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
ASTATRIA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MACTCORA	0.0	0.000	0.0	0.000	29.3	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.000(	0.000)
NATIALDE	14.6	0.016	0.0	0.000	29.3	0.022	0.0	0.000	29.3	0.154	14.6(	14.6)	0.038(	0.065)
TELLFABU	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	14.6	0.000	5.9(	8.0)	0.000(	0.000)
TELLPYGM	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
POLYCHAETA														
AONIPAUC	0.0	0.000	0.0	0.000	175.6	0.022	43.9	0.006	234.1	0.035	90.7(	107.7)	0.013(	0.015)
ETEOLONG	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
EXOGNAID	73.2	0.000	73.2	0.000	219.4	0.004	58.5	0.000	204.8	0.006	125.8(	79.2)	0.002(	0.003)
GLYCLAPI	43.9	0.056	43.9	0.203	424.3	0.231	102.4	0.044	102.4	0.048	143.4(	159.7)	0.116(	0.093)
GONIBOBR	160.9	0.019	29.3	0.022	102.4	0.012	219.4	0.010	87.8	0.018	120.0(	72.7)	0.016(	0.005)
HESIAUGE	0.0	0.000	0.0	0.000	190.2	0.004	0.0	0.000	87.8	0.000	55.6(	84.3)	0.001(	0.002)
LANICONC	43.9	0.821	0.0	0.000	14.6	0.000	0.0	0.000	14.6	0.004	14.6(	17.9)	0.165(	0.367)
MAGEPAPI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
NEPHCAEC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	1.153	2.9(	6.5)	0.231(	0.516)
NEPHCIRR	73.2	1.165	102.4	0.911	29.3	0.669	29.3	0.587	29.3	0.249	52.7(	33.7)	0.716(	0.345)
NEPHHOMB	0.0	0.000	14.6	0.038	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.008(	0.017)
NEPHJUV	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.000	5.9(	13.1)	0.000(	0.000)
NERELONG	14.6	0.000	0.0	0.000	43.9	0.007	43.9	0.012	14.6	0.000	23.4(	19.6)	0.004(	0.005)
OPHELIMA	14.6	0.000	29.3	0.047	14.6	0.095	0.0	0.000	0.0	0.000	11.7(	12.2)	0.028(	0.042)
PISIREMO	190.2	0.000	0.0	0.000	731.5	0.018	73.2	0.000	190.2	0.007	237.0(	288.1)	0.005(	0.008)
PROTKEFE	0.0	0.000	0.0	0.000	29.3	0.004	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.002)
SCOLBONN	14.6	0.249	29.3	0.445	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.139(	0.202)
SCOLS"UA	0.0	0.000	14.6	0.022	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.004(	0.010)
SPIOBOMB	0.0	0.000	0.0	0.000	29.3	0.006	0.0	0.000	58.5	0.006	17.6(	26.2)	0.002(	0.003)
MISCELLANEOUS														
BRANLANC	0.0	0.000	0.0	0.000	146.3	2.137	29.3	0.013	29.3	0.019	41.0(	60.7)	0.434(	0.952)
NEMERTIN	0.0	0.000	87.8	0.199	43.9	0.022	14.6	0.016	43.9	0.042	38.0(	33.7)	0.056(	0.081)
POLIEP	0.0	0.000	0.0	0.000	190.2	0.032	0.0	0.000	0.0	0.000	38.0(	85.1)	0.006(	0.014)
5	936.3	5.533	629.1	5.006	2589.5	4.917	877.8	1.040	1477.6	1.943	1302.1(	783.4)	3.688(	2.044)
NSPC	17		14		23		14		28					
SH-W	2.452		2.397		2.416		2.229		2.837					
SIMP	0.098		0.085		0.131		0.129		0.074					

Appendix - 2 Biomonitoring 1993

STATION : R70
GEOGR. POS. : 54° 07" 5' N 06° 12" 89' E
DATE : 06/05/93
DEPTH m : 32
Median Grain: 215.76
Perc. Mud. : 2.99

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ARGIHAMA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHELEG	58.5	0.029	146.3	0.023	131.7	0.031	29.3	0.018	43.9	0.013	81.9(	53.4)	0.023(	0.008)
BATHGUIL	14.6	0.007	190.2	0.064	87.8	0.022	58.5	0.019	131.7	0.038	96.6(	67.5)	0.030(	0.022)
BATHTENU	0.0	0.000	29.3	0.013	0.0	0.000	14.6	0.004	0.0	0.000	8.8(	13.1)	0.004(	0.006)
CALLSUBT	0.0	0.000	0.0	0.000	14.6	0.026	0.0	0.000	0.0	0.000	2.9(	6.5)	0.005(	0.012)
CAPRELLI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
DIASBRAD	0.0	0.000	29.3	0.007	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.003)
EBALCRAN	0.0	0.000	0.0	0.000	14.6	0.029	0.0	0.000	0.0	0.000	2.9(	6.5)	0.006(	0.013)
HIPPDENT	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	14.6	0.007	8.8(	13.1)	0.004(	0.007)
PERILONG	14.6	0.007	14.6	0.007	0.0	0.000	14.6	0.007	14.6	0.007	11.7(	6.5)	0.006(	0.003)
PONTALTA	73.2	0.037	43.9	0.022	29.3	0.015	43.9	0.022	29.3	0.015	43.9(	17.9)	0.022(	0.009)
PSEULONG	14.6	0.007	0.0	0.000	14.6	0.007	43.9	0.022	43.9	0.022	23.4(	19.6)	0.012(	0.010)
PSEUSIMI	14.6	0.007	0.0	0.000	29.3	0.015	0.0	0.000	14.6	0.007	11.7(	12.2)	0.006(	0.006)
SIPHKROY	0.0	0.000	0.0	0.000	29.3	0.015	14.6	0.007	0.0	0.000	8.8(	13.1)	0.004(	0.007)
UROTPOSE	0.0	0.000	87.8	0.041	58.5	0.034	0.0	0.000	14.6	0.009	32.2(	39.3)	0.017(	0.019)
ECHINODERMATA														
ACROBRAC	14.6	0.101	73.2	0.016	29.3	0.076	0.0	0.000	0.0	0.000	23.4(	30.3)	0.039(	0.047)
AMPHFILI	29.3	0.004	29.3	0.000	0.0	0.000	14.6	0.000	0.0	0.000	14.6(	14.6)	0.001(	0.002)
ECHICORD	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	8.769	5.9(	13.1)	1.754(	3.922)
ECHIPUSI	29.3	0.004	234.1	0.041	73.2	0.013	58.5	0.016	29.3	0.004	84.9(	85.6)	0.016(	0.015)
MOLLUSCA														
ABRAALBA	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
CORBGIBB	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.016	8.8(	19.6)	0.003(	0.007)
CYLICYLI	0.0	0.000	43.9	0.006	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	19.6)	0.001(	0.003)
MONTFERR	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	2.9(	6.5)	0.001(	0.002)
MYSEBIDE	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
NATIALDE	43.9	0.016	29.3	0.029	0.0	0.000	0.0	0.000	58.5	0.042	26.3(	26.2)	0.018(	0.019)
TELLFABU	0.0	0.000	14.6	0.000	58.5	0.000	0.0	0.000	14.6	0.000	17.6(	24.0)	0.000(	0.000)
THRAPHAS	0.0	0.000	0.0	0.000	14.6	0.003	0.0	0.000	14.6	0.003	5.9(	8.0)	0.001(	0.002)
POLYCHAETA														
CHAESETO	29.3	0.010	14.6	0.004	0.0	0.000	0.0	0.000	43.9	0.006	17.6(	19.1)	0.004(	0.004)
ETEOLONG	14.6	0.004	14.6	0.006	14.6	0.006	0.0	0.000	0.0	0.000	8.8(	8.0)	0.003(	0.003)
EUMISANG	29.3	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.000(	0.000)
GONIMACU	29.3	0.212	43.9	0.110	0.0	0.000	0.0	0.000	43.9	0.138	23.4(	22.2)	0.092(	0.092)
HARMLUNU	0.0	0.000	14.6	0.029	0.0	0.000	14.6	0.042	14.6	0.032	8.8(	8.0)	0.021(	0.020)
LANICONC	14.6	0.004	102.4	1.129	87.8	1.703	102.4	0.808	58.5	0.816	73.2(	37.3)	0.892(	0.615)
MAGEPAPI	2443.2	2.310	1726.3	1.191	395.0	0.380	1082.6	0.851	804.7	0.879	1290.4(	806.2)	1.122(	0.724)
NEPHCAEC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	3.173	0.0	0.000	2.9(	6.5)	0.635(	1.419)
NEPHCIRR	0.0	0.000	14.6	0.012	14.6	0.004	0.0	0.000	43.9	0.007	14.6(	17.9)	0.005(	0.005)
NEPHHOMB	14.6	1.141	14.6	1.239	14.6	0.502	29.3	0.976	14.6	0.751	17.6(	6.5)	0.922(	0.299)
OPHIFLEX	0.0	0.000	14.6	0.004	0.0	0.000	14.6	0.007	0.0	0.000	5.9(	8.0)	0.002(	0.003)
PHOLMINU	14.6	0.000	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.001(	0.002)
SCOLBONN	87.8	0.282	43.9	0.218	0.0	0.000	0.0	0.000	14.6	0.050	29.3(	37.3)	0.110(	0.132)
SIGAMATH	29.3	1.470	29.3	0.004	0.0	0.000	14.6	0.004	14.6	0.004	17.6(	12.2)	0.297(	0.656)
SPIOBOMB	29.3	0.010	43.9	0.097	0.0	0.000	73.2	0.218	29.3	0.007	35.1(	26.6)	0.066(	0.093)
SPIOFILI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
STHELIMI	0.0	0.000	0.0	0.000	14.6	0.123	0.0	0.000	0.0	0.000	2.9(	6.5)	0.025(	0.055)
MISCELLANEOUS														
ANTHOZOA	0.0	0.000	43.9	0.351	0.0	0.000	14.6	0.196	14.6	0.831	14.6(	17.9)	0.276(	0.344)
NEMERTIN	321.9	0.064	775.4	0.322	87.8	0.048	263.3	0.086	146.3	0.032	318.9(	271.4)	0.111(	0.120)
PHORONID	160.9	0.064	965.6	0.386	160.9	0.064	160.9	0.064	87.8	0.035	307.2(	369.4)	0.123(	0.148)
POLIEP	0.0	0.000	146.3	0.012	58.5	0.016	73.2	0.022	14.6	0.000	58.5(	57.6)	0.010(	0.010)
5	3540.5	5.795	5018.1	5.404	1448.4	3.132	2179.9	6.579	1872.6	12.547	2811.9(	1461.1)	6.691(	3.515)
NSPC	24		31		23		23		30					
SH-W	1.413		2.240		2.599		2.003		2.427					
SIMP	0.487		0.184		0.107		0.269		0.199					

STATION : SM58
GEOGR. POS. : 55° 00" 01' N 04° 59" 96' E
DATE : 05/05/93
DEPTH m : 42
Median Grain: 147.49
Perc. Mud. : 6.88

	BOX 1 N	BOX 1 B	BOX 2 N	BOX 2 B	BOX 3 N	BOX 3 B	BOX 4 N	BOX 4 B	BOX 5 N	BOX 5 B
CRUSTACEA										
BATHELEG	58.5	0.029	29.3	0.015	58.5	0.029	43.9	0.022	43.9	0.022
BATHTENU	190.2	0.095	278.0	0.139	117.0	0.059	14.6	0.007	14.6	0.007
CALLSUBT	146.3	7.665	58.5	1.937	87.8	2.802	87.8	3.321	87.8	4.562
CUMACEA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000
DIASBRAD	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.031
EUDODEFO	204.8	0.102	131.7	0.066	58.5	0.029	58.5	0.029	102.4	0.051
HARPANTE	160.9	0.080	365.8	0.183	58.5	0.029	29.3	0.015	58.5	0.029
HIPPDENT	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007
IONETHOR	0.0	0.000	0.0	0.000	14.6	0.044	14.6	0.007	29.3	0.073
PERILONG	0.0	0.000	0.0	0.000	14.6	0.007	14.6	0.007	0.0	0.000
PSEULONG	43.9	0.022	14.6	0.007	0.0	0.000	29.3	0.015	14.6	0.007
PSEUSIMI	29.3	0.015	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000
ECHINODERMATA										
AMPHFILI	731.5	7.066	1185.0	9.970	790.0	7.280	731.5	8.229	716.9	7.997
ECHICORD	0.0	0.000	0.0	0.000	29.3	10.588	0.0	0.000	0.0	0.000
MOLLUSCA										
ABRAALBA	14.6	0.035	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000
ABRANITI	0.0	0.000	29.3	0.038	0.0	0.000	0.0	0.000	29.3	0.020
CINGVITR	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	14.6	0.000
CULTPELL	0.0	0.000	14.6	0.294	0.0	0.000	0.0	0.000	0.0	0.000
CYLICYLI	0.0	0.000	73.2	0.076	102.4	0.064	43.9	0.053	29.3	0.048
MONTFERR	0.0	0.000	0.0	0.000	14.6	0.006	0.0	0.000	0.0	0.000
MYSEBIDE	599.8	0.057	1623.9	0.222	936.3	0.135	892.4	0.098	1316.7	0.167
NATIALDE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.010	14.6	0.102
NUCUTENU	131.7	0.037	175.6	0.050	29.3	0.004	73.2	0.023	43.9	0.016
NUCUTURG	14.6	0.200	29.3	0.069	0.0	0.000	0.0	0.000	0.0	0.000
TELLFABU	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	14.6	0.028
THRAPHAS	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.016
VENUSTRI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.003	0.0	0.000
POLYCHAETA										
ARICMINU	14.6	0.000	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000
CHAESETO	58.5	0.012	58.5	0.010	29.3	0.019	0.0	0.000	0.0	0.000
GLYCALBA	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000
LANICONC	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000
MAGEALLE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.132	0.0	0.000
MAGEPAPI	131.7	0.022	58.5	0.007	58.5	0.016	117.0	0.019	146.3	0.038
NEPHCAEC	0.0	0.000	0.0	0.000	14.6	1.110	14.6	1.441	0.0	0.000
NEPHHOMB	58.5	0.578	58.5	0.294	14.6	0.230	14.6	0.279	14.6	0.010
OPHIFLEX	29.3	0.053	29.3	0.047	0.0	0.000	14.6	0.016	14.6	0.007
PHOLMINU	278.0	0.070	380.4	0.078	204.8	0.048	43.9	0.006	102.4	0.025
POECSERP	14.6	0.018	0.0	0.000	14.6	0.048	0.0	0.000	29.3	0.022
PRIOCIRR	0.0	0.000	131.7	0.007	29.3	0.006	0.0	0.000	0.0	0.000
SCOLARMI	29.3	0.059	14.6	0.042	14.6	0.029	0.0	0.000	0.0	0.000
SCOLBONN	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.054
SIGAMATH	0.0	0.000	14.6	0.029	0.0	0.000	0.0	0.000	0.0	0.000
SPIOBOMB	29.3	0.006	58.5	0.004	58.5	0.010	29.3	0.004	87.8	0.007
SPIOFILI	58.5	0.012	14.6	0.004	0.0	0.000	73.2	0.031	43.9	0.004
STHELIMI	0.0	0.000	14.6	0.023	0.0	0.000	0.0	0.000	0.0	0.000
SYNEKLAT	204.8	0.031	102.4	0.016	131.7	0.031	102.4	0.013	117.0	0.018
MISCELLANEOUS										
NEMERTIN	0.0	0.000	0.0	0.000	29.3	0.102	0.0	0.000	14.6	0.010
PHORONID	14.6	0.006	0.0	0.000	58.5	0.023	0.0	0.000	14.6	0.006
S	3247.9	16.269	5003.5	13.637	2984.5	22.750	2516.4	13.789	3204.0	13.386
NSPC	24		29		26		25		29	
SH-W	2.560		2.255		2.281		2.106		2.155	
SIMP	0.109		0.177		0.178		0.215		0.224	

	MEAN N	S.D.	MEAN B	S.D.
CRUSTACEA				
BATHELEG	46.8(	12.2)	0.023(	0.006)
BATHTENU	122.9(	114.1)	0.061(	0.057)
CALLSUBT	93.6(	32.1)	4.057(	2.229)
CUMACEA	2.9(	6.5)	0.001(	0.003)
DIASBRAD	2.9(	6.5)	0.006(	0.014)
EUDODEFO	111.2(	60.9)	0.056(	0.030)
HARPANTE	134.6(	138.6)	0.067(	0.069)
HIPPDENT	2.9(	6.5)	0.001(	0.003)
IONETHOR	11.7(	12.2)	0.025(	0.033)
PERILONG	5.9(	8.0)	0.003(	0.004)
PSEULONG	20.5(	16.7)	0.010(	0.008)
PSEUSIMI	8.8(	13.1)	0.004(	0.007)
ECHINODERMATA				
AMPHFILI	831.0(	199.9)	8.109(	1.147)
ECHICORD	5.9(	13.1)	2.118(	4.735)
MOLLUSCA				
ABRAALBA	2.9(	6.5)	0.007(	0.016)
ABRANITI	11.7(	16.0)	0.012(	0.017)
CINGVITR	5.9(	8.0)	0.000(	0.000)
CULTPELL	2.9(	6.5)	0.059(	0.132)
CYLICYLI	49.7(	39.5)	0.048(	0.029)
MONTFERR	2.9(	6.5)	0.001(	0.003)
MYSEBIDE	1073.8(	399.4)	0.136(	0.063)
NATIALDE	5.9(	8.0)	0.023(	0.045)
NUCUTENU	90.7(	61.6)	0.026(	0.018)
NUCUTURG	8.8(	13.1)	0.054(	0.087)
TELLFABU	5.9(	8.0)	0.006(	0.012)
THRAPHAS	8.8(	19.6)	0.003(	0.007)
VENUSTRI	2.9(	6.5)	0.001(	0.001)
POLYCHAETA				
ARICMINU	5.9(	8.0)	0.000(	0.000)
CHAESETO	29.3(	29.3)	0.008(	0.008)
GLYCALBA	2.9(	6.5)	0.000(	0.000)
LANICONC	2.9(	6.5)	0.000(	0.000)
MAGEALLE	2.9(	6.5)	0.026(	0.059)
MAGEPAPI	102.4(	41.4)	0.020(	0.011)
NEPHCAEC	5.9(	8.0)	0.510(	0.708)
NEPHHOMB	32.2(	24.0)	0.278(	0.203)
OPHIFLEX	17.6(	12.2)	0.025(	0.024)
PHOLMINU	201.9(	134.6)	0.045(	0.030)
POECSERP	11.7(	12.2)	0.018(	0.020)
PRIOCIRR	32.2(	57.0)	0.003(	0.004)
SCOLARMI	11.7(	12.2)	0.026(	0.026)
SCOLBONN	2.9(	6.5)	0.011(	0.024)
SIGAMATH	2.9(	6.5)	0.006(	0.013)
SPIOBOMB	52.7(	24.5)	0.006(	0.002)
SPIOFILI	38.0(	30.3)	0.010(	0.012)
STHELIMI	2.9(	6.5)	0.005(	0.010)
SYNEKLAT	131.7(	42.7)	0.022(	0.008)
MISCELLANEOUS				
NEMERTIN	8.8(	13.1)	0.023(	0.045)
PHORONID	17.6(	24.0)	0.007(	0.010)
S	3391.2(	946.8)	15.966(	3.966)

Appendix - 2 Biomonitoring 1993

STATION : TS4
GEOGR. POS. : 53° 24" 85' N 05° 08" 89' E
DATE : 06/05/93
DEPTH m : 10
Median Grain: 214.05
Perc. Mud. : 1.47

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLFALC	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHELEG	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	14.6	0.009	5.9(	8.0)	0.003(	0.004)
BATHGUIL	73.2	0.070	58.5	0.019	29.3	0.029	14.6	0.029	29.3	0.026	41.0(	24.0)	0.035(	0.020)
DIASBRAD	14.6	0.057	14.6	0.035	14.6	0.007	0.0	0.000	0.0	0.000	8.8(	8.0)	0.020(	0.025)
GAMMSPEC	14.6	0.023	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.005(	0.010)
PETADECL	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PONTALTA	0.0	0.000	29.3	0.015	14.6	0.007	0.0	0.000	0.0	0.000	8.8(	13.1)	0.004(	0.007)
PSEULONG	102.4	0.051	14.6	0.007	73.2	0.037	14.6	0.007	58.5	0.029	52.7(	38.2)	0.026(	0.019)
UROTPOSE	1550.8	0.593	2852.9	1.061	892.4	0.421	570.6	0.249	2516.4	0.966	1676.6(	992.8)	0.658(	0.348)
ECHINODERMATA														
ECHICORD	29.3	11.587	43.9	44.513	29.3	73.855	14.6	9.306	29.3	30.495	29.3(	10.3)	33.951(	26.568)
OPHIALBI	0.0	0.000	14.6	0.000	29.3	0.000	14.6	0.000	0.0	0.000	11.7(	12.2)	0.000(	0.000)
MOLLUSCA														
ABRAALBA	0.0	0.000	0.0	0.000	14.6	0.195	0.0	0.000	0.0	0.000	2.9(	6.5)	0.039(	0.087)
DONAVITT	219.4	26.191	73.2	8.809	146.3	13.130	204.8	29.203	204.8	5.965	169.7(	60.9)	16.659(	10.448)
MACOBALT	43.9	1.592	73.2	2.731	29.3	1.271	43.9	1.264	73.2	2.478	52.7(	19.6)	1.867(	0.692)
MONTFERR	190.2	0.132	614.5	0.451	190.2	0.187	0.0	0.000	482.8	0.396	295.5(	248.2)	0.233(	0.188)
MYSEBIDE	73.2	0.012	102.4	0.019	0.0	0.000	0.0	0.000	0.0	0.000	35.1(	49.2)	0.006(	0.009)
SPISSUBT	0.0	0.000	0.0	0.000	0.0	0.000	14.6	1.460	0.0	0.000	2.9(	6.5)	0.292(	0.653)
TELLFABU	892.4	12.158	1243.6	16.225	994.8	12.084	1126.5	10.417	980.2	9.496	1047.5(	137.9)	12.076(	2.580)
TELLTENU	0.0	0.000	0.0	0.000	14.6	0.897	0.0	0.000	0.0	0.000	2.9(	6.5)	0.179(	0.401)
POLYCHAETA														
CAPICAPI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.010	5.9(	13.1)	0.002(	0.005)
HARMLUNU	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	2.9(	6.5)	0.001(	0.002)
LANICONC	87.8	0.012	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	20.5(	38.2)	0.002(	0.005)
MAGEPAPI	570.6	0.628	1243.6	1.447	936.3	1.181	1258.2	1.538	1228.9	1.169	1047.5(	298.1)	1.192(	0.355)
NEPHCIRR	73.2	0.022	0.0	0.000	73.2	0.282	87.8	0.116	175.6	0.164	81.9(	62.6)	0.117(	0.114)
NEPHHOMB	160.9	5.774	248.7	7.852	175.6	6.254	234.1	12.787	175.6	4.420	199.0(	39.5)	7.417(	3.243)
PECTKORE	14.6	0.350	14.6	0.398	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.150(	0.205)
SCOLARMI	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
SCOLBONN	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.123	5.9(	13.1)	0.025(	0.055)
SPIOBOMB	14.6	0.000	0.0	0.000	29.3	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.000(	0.000)
SPIOFILI	14.6	0.010	102.4	0.029	131.7	0.038	29.3	0.006	146.3	0.041	84.9(	59.8)	0.025(	0.016)
MISCELLANEOUS														
ANTHOZOA	14.6	0.263	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.053(	0.118)
NEMERTIN	87.8	0.322	87.8	0.606	43.9	0.654	43.9	0.483	43.9	0.252	61.4(	24.0)	0.463(	0.175)
5	4272.0	59.853	6832.2	84.216	3876.9	110.538	3686.8	66.871	6247.0	56.043	4983.0(	1451.4)	75.504(	22.369)
NSPC	22		17		20		15		18					
SH-W	2.073		1.750		2.047		1.718		1.849					
SIMP	0.199		0.249		0.182		0.239		0.233					

Appendix - 2 Biomonitoring 1993

STATION : TS30
GEOGR. POS. : 53° 36" 85' N 04° 56" 24' E
DATE : 06/05/93
DEPTH m : 26
Median Grain: 213.39
Perc. Mud. : 0.71

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHELEG	351.1	0.078	804.7	0.129	131.7	0.019	43.9	0.012	0.0	0.000	266.3(	330.0)	0.047(	0.054)
BATHGUIL	87.8	0.041	248.7	0.099	29.3	0.013	14.6	0.012	0.0	0.000	76.1(	102.1)	0.033(	0.040)
CAPRELLI	0.0	0.000	0.0	0.000	29.3	0.015	0.0	0.000	14.6	0.007	8.8(	13.1)	0.004(	0.007)
DIASBRAD	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
MEGAAGIL	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.007)
PERILONG	0.0	0.000	0.0	0.000	29.3	0.015	14.6	0.007	0.0	0.000	8.8(	13.1)	0.004(	0.007)
PONTALTA	73.2	0.037	73.2	0.037	58.5	0.029	58.5	0.029	43.9	0.022	61.4(	12.2)	0.031(	0.006)
PSEULONG	14.6	0.007	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.003(	0.004)
SIPHKROY	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
UROTPOSE	380.4	0.111	424.3	0.129	321.9	0.099	541.3	0.152	395.0	0.114	412.6(	81.1)	0.121(	0.020)
ECHINODERMATA														
ACROBRAC	0.0	0.000	14.6	0.098	0.0	0.000	0.0	0.000	14.6	0.000	5.9(	8.0)	0.020(	0.044)
ECHICORD	58.5	14.348	146.3	27.601	58.5	7.445	58.5	13.376	58.5	15.713	76.1(	39.3)	15.697(	7.366)
MOLLUSCA														
ABRAALBA	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.000	5.9(	13.1)	0.000(	0.000)
CORBGIBB	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.003	2.9(	6.5)	0.001(	0.001)
CULTPELL	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	5.9(	8.0)	0.000(	0.000)
DONAVITT	58.5	7.505	73.2	8.671	29.3	0.000	29.3	5.596	87.8	11.643	55.6(	26.2)	6.683(	4.332)
MACTCORA	14.6	0.758	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.152(	0.339)
MONTFERR	43.9	0.007	73.2	0.026	117.0	0.016	146.3	0.028	204.8	0.130	117.0(	62.9)	0.042(	0.050)
MYSEBIDE	0.0	0.000	14.6	0.000	43.9	0.000	234.1	0.015	43.9	0.000	67.3(	95.2)	0.003(	0.007)
NATIALDE	43.9	0.091	43.9	0.056	14.6	0.219	29.3	0.037	73.2	0.282	41.0(	21.7)	0.137(	0.108)
NUCUTURG	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.099	0.0	0.000	5.9(	13.1)	0.020(	0.044)
TELLFABU	131.7	0.000	160.9	0.159	146.3	0.531	219.4	0.018	117.0	0.148	155.1(	39.5)	0.171(	0.214)
THRAPHAS	0.0	0.000	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
POLYCHAETA														
CHAESETO	43.9	0.018	73.2	0.026	14.6	0.004	117.0	0.042	14.6	0.006	52.7(	43.4)	0.019(	0.016)
ETEOLACT	14.6	0.004	0.0	0.000	0.0	0.000	14.6	0.010	29.3	0.004	11.7(	12.2)	0.004(	0.004)
ETEOLONG	14.6	0.000	14.6	0.006	0.0	0.000	29.3	0.012	0.0	0.000	11.7(	12.2)	0.004(	0.005)
GONIMACU	29.3	0.070	0.0	0.000	14.6	0.078	58.5	0.206	0.0	0.000	20.5(	24.5)	0.071(	0.084)
GYPTCAPE	43.9	0.004	0.0	0.000	14.6	0.006	0.0	0.000	14.6	0.004	14.6(	17.9)	0.003(	0.003)
MAGEPAPI	1009.5	0.598	892.4	0.418	482.8	0.278	1375.2	0.989	1009.5	0.783	953.9(	319.9)	0.613(	0.283)
NEPHCAEC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	9.561	14.6	0.451	5.9(	8.0)	2.002(	4.230)
NEPHCIRR	14.6	0.010	58.5	0.019	190.2	0.050	190.2	0.061	14.6	0.004	93.6(	89.9)	0.029(	0.025)
NEPHHOMB	14.6	0.029	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.364	8.8(	13.1)	0.079(	0.160)
NOTOLATE	0.0	0.000	14.6	0.164	0.0	0.000	43.9	0.869	0.0	0.000	11.7(	19.1)	0.207(	0.377)
SCOLARMI	29.3	0.010	14.6	0.006	14.6	0.006	43.9	0.018	0.0	0.000	20.5(	16.7)	0.008(	0.007)
SIGAMATH	58.5	0.514	43.9	1.919	14.6	0.435	43.9	0.306	73.2	1.383	46.8(	21.7)	0.911(	0.705)
SPIOBOMB	58.5	0.007	73.2	0.004	190.2	0.010	175.6	0.006	73.2	0.010	114.1(	63.3)	0.008(	0.003)
MISCELLANEOUS														
ANTHOZOA	14.6	0.019	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.004(	0.009)
NEMERTIN	87.8	1.974	146.3	0.155	14.6	0.019	73.2	0.161	73.2	0.026	79.0(	47.0)	0.467(	0.845)
5	2706.5	26.240	3481.9	39.760	1975.1	9.292	3599.0	31.621	2457.8	31.098	2844.1(	689.2)	27.602(	11.328)
NSPC	25		24		22		24		23					
SH-W	2.298		2.350		2.465		2.286		2.184					
SIMP	0.180		0.144		0.115		0.183		0.206					

Appendix - 2 Biomonitoring 1993

STATION : META2
GEOGR. POS. : 53° 41° 93' N 04° 29° 66' E
DATE : 06/05/93
DEPTH m : 39
Median Grain: 100.45
Perc. Mud. : 20.56

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPETENU	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.013	0.0	0.000	2.9(	6.5)	0.003(	0.006)
BATHELEG	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
CALLSUBT	190.2	5.937	190.2	5.121	160.9	2.249	219.4	0.442	190.2	1.421	190.2(	20.7)	3.034(	2.383)
DIASBRAD	0.0	0.000	29.3	0.013	0.0	0.000	14.6	0.023	0.0	0.000	8.8(	13.1)	0.007(	0.011)
EUDOTRUN	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.007)
HARPANTE	117.0	0.059	0.0	0.000	14.6	0.007	160.9	0.080	43.9	0.022	67.3(	69.1)	0.034(	0.035)
HARPPECT	0.0	0.000	29.3	0.015	14.6	0.007	0.0	0.000	29.3	0.015	14.6(	14.6)	0.007(	0.007)
IONETHOR	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PERILONG	14.6	0.007	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.003(	0.004)
TRYPSARS	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
UPOGDELT	14.6	9.700	29.3	4.951	0.0	0.000	14.6	1.510	58.5	5.480	23.4(	22.2)	4.328(	3.783)
ECHINODERMATA														
AMPHFILI	892.4	6.693	190.2	0.670	980.2	7.455	1097.3	10.774	1565.4	17.176	945.1(	495.4)	8.554(	6.043)
ECHICORD	43.9	0.413	0.0	0.000	14.6	0.323	58.5	0.578	0.0	0.000	23.4(	26.6)	0.263(	0.257)
MOLLUSCA														
ABRAALBA	175.6	0.010	263.3	0.013	131.7	0.004	204.8	0.019	29.3	0.019	160.9(	87.8)	0.013(	0.006)
CORBGIBB	14.6	0.092	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.018(	0.041)
CYLICYLI	29.3	0.004	73.2	0.075	14.6	0.003	0.0	0.000	0.0	0.000	23.4(	30.3)	0.016(	0.033)
DEVOPERR	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
LEPTS°UA	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.016	2.9(	6.5)	0.003(	0.007)
MONTFERR	14.6	0.006	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	5.9(	8.0)	0.002(	0.003)
MYSEBIDE	819.3	0.164	146.3	0.016	643.7	0.129	1155.8	0.231	1404.5	0.281	833.9(	484.3)	0.164(	0.102)
MYSIUNDA	14.6	0.822	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.164(	0.368)
NATIALDE	29.3	0.018	14.6	0.004	14.6	0.004	43.9	0.019	43.9	0.023	29.3(	14.6)	0.014(	0.009)
NUCUTURG	0.0	0.000	14.6	0.000	0.0	0.000	29.3	0.004	43.9	0.012	17.6(	19.1)	0.003(	0.005)
THRACONV	0.0	0.000	0.0	0.000	0.0	0.000	14.6	6.589	0.0	0.000	2.9(	6.5)	1.318(	2.947)
TURRCOMM	14.6	0.691	0.0	0.000	0.0	0.000	14.6	0.515	0.0	0.000	5.9(	8.0)	0.241(	0.336)
POLYCHAETA														
CHAEVARI	58.5	4.464	14.6	3.167	43.9	12.939	58.5	26.455	43.9	13.724	43.9(	17.9)	12.150(	9.321)
GATTCIRR	14.6	0.554	14.6	0.477	58.5	1.315	43.9	0.947	14.6	0.398	29.3(	20.7)	0.738(	0.385)
GLYCROUX	0.0	0.000	0.0	0.000	14.6	2.382	0.0	0.000	14.6	0.013	5.9(	8.0)	0.479(	1.064)
GYPTCAPE	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
LUMBLATR	160.9	0.342	43.9	0.092	146.3	0.470	204.8	0.312	160.9	0.247	143.4(	59.8)	0.293(	0.138)
LUMBPSEU	0.0	0.000	0.0	0.000	58.5	0.199	0.0	0.000	0.0	0.000	11.7(	26.2)	0.040(	0.089)
NEPHHOMB	14.6	0.006	14.6	0.060	29.3	0.085	43.9	1.075	29.3	0.941	26.3(	12.2)	0.433(	0.528)
NERELONG	14.6	0.013	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.029	5.9(	8.0)	0.008(	0.013)
NOTOLATE	0.0	0.000	0.0	0.000	14.6	1.641	14.6	0.038	14.6	0.186	8.8(	8.0)	0.373(	0.713)
OPHIFLEX	0.0	0.000	0.0	0.000	14.6	0.072	14.6	0.035	0.0	0.000	5.9(	8.0)	0.021(	0.032)
ORBISPEC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	1.043	0.0	0.000	2.9(	6.5)	0.209(	0.466)
OWENFUSI	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.189	43.9	0.369	17.6(	24.0)	0.111(	0.165)
PHOLMINU	73.2	0.032	43.9	0.023	204.8	0.083	146.3	0.056	87.8	0.050	111.2(	64.3)	0.049(	0.023)
POLYSPEC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	102.4	0.095	20.5(	45.8)	0.019(	0.043)
PRIOCIRR	0.0	0.000	0.0	0.000	43.9	0.013	14.6	0.010	0.0	0.000	11.7(	19.1)	0.005(	0.006)
SPIOBOMB	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.018	0.0	0.000	2.9(	6.5)	0.004(	0.008)
SPIOFILI	0.0	0.000	29.3	0.004	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.002)
STHELIMI	0.0	0.000	14.6	0.083	0.0	0.000	14.6	0.041	0.0	0.000	5.9(	8.0)	0.025(	0.037)
SYNEKLAT	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.006	2.9(	6.5)	0.001(	0.003)
MISCELLANEOUS														
CUCUELON	14.6	0.221	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.044(	0.099)
GOLFELON	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.219	2.9(	6.5)	0.044(	0.098)
GOLFPROC	0.0	0.000	0.0	0.000	14.6	0.278	43.9	0.647	14.6	0.164	14.6(	17.9)	0.218(	0.267)
LEPTINHA	14.6	0.604	0.0	0.000	0.0	0.000	0.0	0.000	14.6	3.017	5.9(	8.0)	0.724(	1.308)
NEMERTIN	43.9	2.307	29.3	2.234	0.0	0.000	14.6	0.064	29.3	0.061	23.4(	16.7)	0.933(	1.221)
PHORONID	73.2	0.029	58.5	0.023	14.6	0.006	29.3	0.012	0.0	0.000	35.1(	30.3)	0.014(	0.012)
5	2882.1	33.195	1287.4	17.064	2677.3	29.677	3789.2	51.746	4052.5	43.984	2937.7(	1091.1)	35.133(	13.363)
NSPC	25		21		23		30		26					
SH-W	2.170		2.543		2.076		2.224		1.834					
SIMP	0.188		0.100		0.204		0.188		0.273					

STATION : TS100
GEOGR. POS. : 54° 08" 91' N 04° 20" 54' E
DATE : 05/05/93
DEPTH m : 49
Median Grain: 92.17
Perc. Mud. : 16.55

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPEDIAD	0.0	0.000	0.0	0.000	14.6	0.023	0.0	0.000	0.0	0.000	2.9(	6.5)	0.005(	0.010)
AMPETENU	14.6	0.009	29.3	0.031	14.6	0.007	14.6	0.007	0.0	0.000	14.6(	10.3)	0.011(	0.012)
AORIDAE	14.6	0.007	0.0	0.000	0.0	0.000	43.9	0.022	0.0	0.000	11.7(	19.1)	0.006(	0.010)
ARGIHAMA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
CALLSUBT	175.6	5.719	146.3	5.094	131.7	2.088	248.7	5.122	263.3	4.872	193.1(	59.8)	4.579(	1.428)
DIASBRAD	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
EBALSPEC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.003	2.9(	6.5)	0.001(	0.001)
EUDOTRUN	0.0	0.000	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.007)
HARPANTE	58.5	0.029	87.8	0.044	43.9	0.022	102.4	0.051	146.3	0.073	87.8(	40.1)	0.044(	0.020)
HARPCREN	14.6	0.007	14.6	0.007	14.6	0.007	29.3	0.015	29.3	0.015	20.5(	8.0)	0.010(	0.004)
IONETHOR	0.0	0.000	29.3	0.023	14.6	0.022	0.0	0.000	43.9	0.040	17.6(	19.1)	0.017(	0.017)
LEUCLILL	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	29.3	0.015	8.8(	13.1)	0.004(	0.007)
LEUCRICH	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEULONG	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
UPOGDELT	43.9	3.937	14.6	0.044	43.9	0.838	87.8	0.322	87.8	134.315	55.6(	31.7)	27.891(	59.513)
UPOGSTEL	0.0	0.000	0.0	0.000	14.6	0.208	0.0	0.000	0.0	0.000	2.9(	6.5)	0.042(	0.093)
ECHINODERMATA														
AMPHFILI	160.9	0.354	512.0	1.855	321.9	0.764	307.2	0.319	146.3	0.644	289.7(	148.3)	0.787(	0.626)
OPHIALBI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
MOLLUSCA														
ABRANITI	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.013	0.0	0.000	8.8(	19.6)	0.003(	0.006)
ARCTISLA	14.6	0.012	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
BIVALVIA	0.0	0.000	29.3	0.000	160.9	0.009	0.0	0.000	175.6	0.010	73.2(	87.8)	0.004(	0.005)
CINGVITR	58.5	0.010	0.0	0.000	0.0	0.000	234.1	0.041	204.8	0.037	99.5(	112.6)	0.018(	0.020)
CORBGIBB	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	14.6	0.003	5.9(	8.0)	0.002(	0.003)
CYLICYLI	73.2	0.013	14.6	0.000	73.2	0.012	43.9	0.016	0.0	0.000	41.0(	33.4)	0.008(	0.008)
LEPTS°UA	14.6	0.004	0.0	0.000	29.3	0.009	0.0	0.000	14.6	0.007	11.7(	12.2)	0.004(	0.004)
MYSEBIDE	14.6	0.000	307.2	0.018	146.3	0.009	87.8	0.006	131.7	0.007	137.5(	107.8)	0.008(	0.006)
NATIALDE	0.0	0.000	0.0	0.000	14.6	0.003	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.001)
NUCUTENU	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
NUCUTURG	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	58.5	0.121	14.6(	25.3)	0.025(	0.054)
VENUSTRI	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
APHRACUL	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	0.0	0.000	2.9(	6.5)	0.001(	0.002)
POLYCHAETA														
CAULSPEC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	2.9(	6.5)	0.001(	0.002)
CHAESETO	14.6	0.004	29.3	0.010	14.6	0.007	43.9	0.013	14.6	0.004	23.4(	13.1)	0.008(	0.004)
CHAEVARI	43.9	19.070	29.3	14.337	43.9	22.110	58.5	14.996	73.2	30.858	49.7(	16.7)	20.274(	6.707)
CIRRCIRR	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
EXOGHEBE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
GATTCIRR	14.6	0.164	29.3	1.315	29.3	1.257	43.9	0.992	117.0	2.739	46.8(	40.6)	1.293(	0.930)
GLYCJUV	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
GLYCROUX	43.9	4.651	14.6	0.140	58.5	0.578	43.9	1.381	43.9	1.997	41.0(	16.0)	1.749(	1.773)
GONIMACU	0.0	0.000	14.6	0.000	0.0	0.000	14.6	0.007	0.0	0.000	5.9(	8.0)	0.001(	0.003)
GYPTCAPE	29.3	0.010	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.002(	0.005)
HARMLONG	0.0	0.000	14.6	0.048	14.6	0.031	0.0	0.000	0.0	0.000	5.9(	8.0)	0.016(	0.023)
LUMBLATR	0.0	0.000	73.2	0.211	58.5	0.135	58.5	0.095	14.6	0.092	41.0(	31.7)	0.107(	0.076)
LUMBPSEU	0.0	0.000	0.0	0.000	14.6	0.035	29.3	0.114	14.6	0.050	11.7(	12.2)	0.040(	0.047)
MEDIGRAC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
NEPHHOMB	0.0	0.000	14.6	0.053	43.9	0.306	117.0	0.641	14.6	0.044	38.0(	47.0)	0.209(	0.270)
NEPHINCI	0.0	0.000	14.6	0.072	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.014(	0.032)
NERELONG	0.0	0.000	0.0	0.000	14.6	0.000	14.6	0.129	0.0	0.000	5.9(	8.0)	0.026(	0.058)
NOTOLATE	29.3	0.445	43.9	0.933	58.5	1.141	29.3	0.718	58.5	0.620	43.9(	14.6)	0.772(	0.272)
OPHEACUM	0.0	0.000	0.0	0.000	14.6	0.119	0.0	0.000	14.6	0.085	5.9(	8.0)	0.041(	0.057)
OPHIFLEX	0.0	0.000	14.6	0.067	29.3	0.102	43.9	0.177	73.2	0.126	32.2(	28.1)	0.095(	0.066)
PARAGRAC	0.0	0.000	0.0	0.000	29.3	0.004	43.9	0.004	43.9	0.006	23.4(	22.2)	0.003(	0.003)
PECTAURI	0.0	0.000	0.0	0.000	29.3	0.007	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.003)
PECTKORE	29.3	0.436	0.0	0.000	29.3	0.004	0.0	0.000	0.0	0.000	11.7(	16.0)	0.088(	0.194)
PHOLMINU	29.3	0.004	14.6	0.000	0.0	0.000	29.3	0.010	0.0	0.000	14.6(	14.6)	0.003(	0.005)
POECSERP	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.012	2.9(	6.5)	0.002(	0.005)
POLYSPEC	0.0	0.000	14.6	0.000	234.1	0.089	0.0	0.000	43.9	0.066	58.5(	99.8)	0.031(	0.043)
PRIOCIRR	58.5	0.012	0.0	0.000	0.0	0.000	14.6	0.000	43.9	0.006	23.4(	26.6)	0.004(	0.005)
SPIOBOMB	0.0	0.000	14.6	0.019	0.0	0.000	14.6	0.006	0.0	0.000	5.9(	8.0)	0.005(	0.008)
SPIOFILI	0.0	0.000	43.9	0.006	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	19.6)	0.001(	0.003)
SPIOKROY	0.0	0.000	14.6	0.037	58.5	0.010	0.0	0.000	29.3	0.060	20.5(	24.5)	0.021(	0.026)
STHELIMI	0.0	0.000	0.0	0.000	14.6	0.206	0.0	0.000	14.6	0.119	5.9(	8.0)	0.065(	0.094)
SYNEKLAT	29.3	0.004	43.9	0.010	29.3	0.007	29.3	0.006	29.3	0.007	32.2(	6.5)	0.007(	0.002)
MISCELLANEOUS														
GOLFELON	14.6	0.494	14.6	0.350	131.7	2.331	14.6	0.016	102.4	1.552	55.6(	57.0)	0.949(	0.963)
GOLFVULG	0.0	0.000	0.0	0.000	73.2	0.357	14.6	0.342	43.9	1.170	26.3(	31.7)	0.374(	0.478)
NEMERTIN	14.6	0.811	29.3	0.569	73.2	0.035	0.0	0.000	14.6	0.010	26.3(	28.1)	0.285(	0.379)
PHORONID	0.0	0.000	0.0	0.000	58.5	0.023	29.3	0.012	73.2	0.029	32.2(	33.4)	0.013(	0.013)
PLATWORM	0.0	0.000	29.3	0.006	29.3	0.010	0.0	0.000	0.0	0.000	11.7(	16.0)	0.003(	0.005)
5	1024.1	36.208	1711.7	25.304	2311.5	32.963	2004.3	25.610	2326.2	179.832	1875.6(	538.9)	59.983(	67.163)
NSPC	25		31		43		35		40					
SH-W	2.853		2.615		3.298		3.066		3.269					
SIMP	0.067		0.131		0.049		0.063		0.045					

Appendix - 2 Biomonitoring 1993

STATION : SM30
GEOGR. POS. : 54° 29' 93' N 04° 00' 02' E
DATE : 05/05/93
DEPTH m : 45
Median Grain: 107.48
Perc. Mud. : 10.91

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPEBREV	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.086	2.9(	6.5)	0.017(	0.039)
AMPETENU	14.6	0.007	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	5.9(	8.0)	0.003(	0.004)
ARGIHAMA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHTENU	14.6	0.007	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	5.9(	8.0)	0.003(	0.004)
CALLSUBT	0.0	0.000	14.6	0.004	0.0	0.000	43.9	3.009	29.3	2.063	17.6(	19.1)	1.015(	1.428)
DIASBRAD	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.026	14.6	0.007	5.9(	8.0)	0.007(	0.011)
EUDODEFO	29.3	0.015	43.9	0.022	43.9	0.022	43.9	0.022	58.5	0.029	43.9(	10.3)	0.022(	0.005)
EUDOTRUN	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
HARPANTE	73.2	0.037	146.3	0.073	43.9	0.022	117.0	0.059	14.6	0.007	79.0(	53.4)	0.040(	0.027)
HARPCREN	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PERILONG	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEULONG	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEUSIMI	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
ECHINODERMATA														
AMPHFILI	1682.5	7.927	1521.5	4.834	2384.7	10.365	1565.4	5.221	2209.1	8.099	1872.6(	396.6)	7.289(	2.282)
BRISLYRI	14.6	5.912	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	1.182(	2.644)
ECHICORD	0.0	0.000	14.6	0.138	14.6	5.413	0.0	0.000	0.0	0.000	5.9(	8.0)	1.110(	2.406)
ECHIFLAV	14.6	3.344	0.0	0.000	0.0	0.000	0.0	0.000	14.6	2.143	5.9(	8.0)	1.098(	1.562)
MOLLUSCA														
ARCTISLA	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
CORBGIBB	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.003	2.9(	6.5)	0.001(	0.001)
CULTPELL	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.364	0.0	0.000	2.9(	6.5)	0.073(	0.163)
CYLICYLI	73.2	0.041	102.4	0.059	73.2	0.037	58.5	0.028	87.8	0.038	79.0(	16.7)	0.040(	0.011)
EULIALBA	14.6	0.015	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.007)
MONTFERR	14.6	0.006	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
MYSEBIDE	1097.3	0.219	687.6	0.138	1214.3	0.243	1097.3	0.219	1068.0	0.214	1032.9(	201.0)	0.207(	0.040)
NUCUTENU	29.3	0.013	14.6	0.003	43.9	0.016	58.5	0.031	73.2	0.037	43.9(	23.1)	0.020(	0.014)
NUCUTURG	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.050	2.9(	6.5)	0.010(	0.022)
THYAFLEX	0.0	0.000	0.0	0.000	29.3	0.070	0.0	0.000	0.0	0.000	5.9(	13.1)	0.014(	0.031)
POLYCHAETA														
ARICMINU	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
CHAESETO	0.0	0.000	14.6	0.004	14.6	0.004	0.0	0.000	0.0	0.000	5.9(	8.0)	0.002(	0.002)
DIPLGLAU	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.019	0.0	0.000	5.9(	13.1)	0.004(	0.009)
EXOGHEBE	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
HARMLONG	14.6	0.006	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
MAGEPAPI	0.0	0.000	43.9	0.007	0.0	0.000	43.9	0.010	14.6	0.006	20.5(	22.2)	0.005(	0.005)
MEDIGRAC	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
NEPHHOMB	29.3	0.044	0.0	0.000	73.2	0.873	58.5	0.253	14.6	0.059	35.1(	30.3)	0.246(	0.364)
OPHIFLEX	29.3	0.042	0.0	0.000	0.0	0.000	73.2	0.086	0.0	0.000	20.5(	32.1)	0.026(	0.039)
PARAGRAC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
PECTKORE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	0.0	0.000	2.9(	6.5)	0.001(	0.002)
PHOLMINU	190.2	0.032	43.9	0.006	248.7	0.047	73.2	0.018	146.3	0.019	140.4(	83.8)	0.024(	0.016)
PRIOCIRR	87.8	0.010	43.9	0.004	29.3	0.004	14.6	0.004	29.3	0.007	41.0(	28.1)	0.006(	0.003)
SCOLARMI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.016	0.0	0.000	2.9(	6.5)	0.003(	0.007)
SIGAMATH	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.023	0.0	0.000	2.9(	6.5)	0.005(	0.010)
SPIOBOMB	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
SPIOFILI	0.0	0.000	0.0	0.000	29.3	0.000	0.0	0.000	29.3	0.004	11.7(	16.0)	0.001(	0.002)
STHELIMI	0.0	0.000	43.9	0.085	0.0	0.000	14.6	0.041	43.9	0.050	20.5(	22.2)	0.035(	0.036)
SYNEKLAT	14.6	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	5.9(	8.0)	0.001(	0.003)
MISCELLANEOUS														
ANTHOZOA	14.6	0.038	0.0	0.000	43.9	0.158	14.6	0.035	14.6	0.029	17.6(	16.0)	0.052(	0.061)
NEMERTIN	0.0	0.000	14.6	0.010	0.0	0.000	0.0	0.000	14.6	0.006	5.9(	8.0)	0.003(	0.005)
PHORONID	14.6	0.006	43.9	0.018	58.5	0.023	14.6	0.006	0.0	0.000	26.3(	24.0)	0.011(	0.010)
PLATWORM	0.0	0.000	14.6	0.013	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.006)
S	3525.8	17.736	2852.8	5.432	4389.0	17.313	3452.7	9.518	3935.5	12.964	3631.2(	573.5)	12.593(	5.234)
NSPC	24		19		18		25		21					
SH-W	1.604		1.579		1.423		1.716		1.410					
SIMP	0.327		0.345		0.374		0.307		0.389					

Appendix - 2 Biomonitoring 1993

STATION : RHC4
GEOGR. POS. : 54° 51" 62' N 03° 17" 62' E
DATE : 05/05/93
DEPTH m : 40
Median Grain: 143.25
Perc. Mud. : 5.67

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPETENU	29.3	0.015	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	8.8(	13.1)	0.004(	0.007)
BATHTENU	73.2	0.037	87.8	0.044	0.0	0.000	73.2	0.037	73.2	0.037	61.4(	34.9)	0.031(	0.017)
CALLSUBT	0.0	0.000	29.3	0.424	29.3	0.099	0.0	0.000	58.5	0.560	23.4(	24.5)	0.217(	0.259)
CAPRELLI	0.0	0.000	14.6	0.007	14.6	0.007	0.0	0.000	0.0	0.000	5.9(	8.0)	0.003(	0.004)
COROAFFI	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.015	0.0	0.000	5.9(	13.1)	0.003(	0.007)
EUDODEFO	29.3	0.015	0.0	0.000	14.6	0.007	14.6	0.007	0.0	0.000	11.7(	12.2)	0.006(	0.006)
EUDOTRUN	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
HARPANTE	117.0	0.059	87.8	0.044	73.2	0.037	43.9	0.022	87.8	0.044	81.9(	26.6)	0.041(	0.013)
HIPPDENT	14.6	0.007	0.0	0.000	0.0	0.000	14.6	0.007	14.6	0.007	8.8(	8.0)	0.004(	0.004)
IONETHOR	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
IPHITRIS	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PERILONG	0.0	0.000	14.6	0.007	0.0	0.000	29.3	0.015	29.3	0.015	14.6(	14.6)	0.007(	0.007)
PSEULONG	29.3	0.015	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.004(	0.007)
SYNCMACU	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
TRYPSARS	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
ECHINODERMATA														
ACROBRAC	204.8	2.570	43.9	1.381	160.9	1.362	131.7	0.440	160.9	0.009	140.4(	60.0)	1.153(	0.990)
AMPHFILI	4184.2	6.007	4067.1	7.221	3789.2	10.970	3145.4	57.587	4286.6	38.808	3894.5(	458.2)	24.118(	23.034)
ECHICORD	0.0	0.000	29.3	7.217	14.6	1.674	29.3	3.243	29.3	8.677	20.5(	13.1)	4.162(	3.677)
MOLLUSCA														
ABRANITI	14.6	0.051	0.0	0.000	14.6	0.088	29.3	0.013	14.6	0.000	14.6(	10.3)	0.030(	0.038)
ABRAPRIS	0.0	0.000	0.0	0.000	14.6	0.069	0.0	0.000	0.0	0.000	2.9(	6.5)	0.014(	0.031)
CULTPELL	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.516	8.8(	13.1)	0.104(	0.230)
CYLICYLI	43.9	0.082	43.9	0.060	102.4	0.278	29.3	0.041	29.3	0.000	49.7(	30.3)	0.092(	0.108)
DOSILUPI	14.6	1.646	0.0	0.000	14.6	0.914	0.0	0.000	0.0	0.000	5.9(	8.0)	0.512(	0.747)
EULIALBA	58.5	0.006	29.3	0.003	43.9	0.009	87.8	0.018	14.6	0.000	46.8(	28.1)	0.007(	0.007)
GARIFERV	14.6	0.016	0.0	0.000	0.0	0.000	0.0	0.000	14.6	10.776	5.9(	8.0)	2.159(	4.818)
LUCIBORE	0.0	0.000	14.6	0.860	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.172(	0.385)
MACTCORA	0.0	0.000	0.0	0.000	14.6	0.010	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
MONTFERR	0.0	0.000	14.6	0.010	14.6	0.022	0.0	0.000	43.9	0.092	14.6(	17.9)	0.025(	0.039)
MYSEBIDE	526.7	0.105	365.8	0.073	658.3	0.132	716.9	0.143	307.2	0.061	515.0(	178.1)	0.103(	0.036)
MYSIUNDA	0.0	0.000	14.6	0.000	14.6	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.000(	0.000)
NATIALDE	29.3	0.070	43.9	0.010	43.9	0.233	29.3	0.004	43.9	0.007	38.0(	8.0)	0.065(	0.098)
NUCUTENU	87.8	0.016	73.2	0.020	87.8	0.026	146.3	0.032	102.4	0.029	99.5(	28.1)	0.025(	0.007)
NUCUTURG	175.6	0.328	102.4	0.862	58.5	0.038	87.8	0.257	58.5	0.086	96.6(	48.1)	0.314(	0.328)
TELLFABU	102.4	0.004	87.8	0.003	43.9	0.069	102.4	0.003	146.3	0.211	96.6(	36.7)	0.058(	0.090)
THRAPHAS	0.0	0.000	43.9	0.029	29.3	0.006	0.0	0.000	14.6	0.000	17.6(	19.1)	0.007(	0.013)
THYAFLEX	43.9	0.101	14.6	0.067	58.5	0.082	14.6	0.000	58.5	0.145	38.0(	22.2)	0.079(	0.053)
VENUSTRI	14.6	3.312	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.028	8.8(	13.1)	0.668(	1.478)
ANAIMACU	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
ANAISUBU	14.6	0.004	14.6	0.004	29.3	0.004	14.6	0.006	73.2	0.007	29.3(	25.3)	0.005(	0.001)
POLYCHAETA														
APHRACUL	14.6	0.006	14.6	0.042	14.6	0.006	0.0	0.000	14.6	0.006	11.7(	6.5)	0.012(	0.017)
CAPICAPI	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
CAPITELL	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
CHAESETO	29.3	0.010	14.6	0.006	0.0	0.000	14.6	0.004	43.9	0.007	20.5(	16.7)	0.006(	0.004)
DIPLGLAU	29.3	0.007	14.6	0.007	43.9	0.018	14.6	0.012	14.6	0.061	23.4(	13.1)	0.021(	0.023)
GLYCNORD	29.3	0.056	58.5	0.113	14.6	0.004	14.6	0.042	29.3	0.004	29.3(	17.9)	0.044(	0.045)
GONIMACU	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.193	0.0	0.000	5.9(	13.1)	0.039(	0.086)
HARMJUV	43.9	0.006	43.9	0.006	0.0	0.000	14.6	0.059	43.9	0.007	29.3(	20.7)	0.016(	0.024)
HARMLONG	43.9	0.004	87.8	0.006	0.0	0.000	0.0	0.000	0.0	0.000	26.3(	39.3)	0.002(	0.003)
HARMLUNU	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.078	0.0	0.000	5.9(	13.1)	0.016(	0.035)
LANICONC	292.6	0.249	365.8	0.470	321.9	0.019	321.9	0.019	234.1	0.345	307.2(	48.5)	0.220(	0.200)
MAGEALLE	14.6	0.189	29.3	0.518	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.141(	0.226)
MAGEPAPI	321.9	0.070	468.2	0.098	204.8	0.048	190.2	0.048	219.4	0.072	280.9(	116.8)	0.067(	0.021)
NEPHHOMB	175.6	0.664	175.6	0.470	204.8	1.154	190.2	1.122	160.9	0.732	181.4(	16.7)	0.828(	0.299)
NOTOLATE	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.786	14.6	0.006	8.8(	13.1)	0.158(	0.351)
OPHIFLEX	29.3	0.041	58.5	0.155	29.3	0.016	43.9	0.140	73.2	0.080	46.8(	19.1)	0.087(	0.061)
PECTAURI	0.0	0.000	14.6	0.080	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.016(	0.036)
PECTKORE	0.0	0.000	29.3	0.006	0.0	0.000	14.6	0.000	0.0	0.000	8.8(	13.1)	0.001(	0.003)
PHOLMINU	438.9	0.044	555.9	0.075	570.6	0.075	336.5	0.070	614.5	0.079	503.3(	113.6)	0.068(	0.014)
PRIOCIRR	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
SCALINFL	0.0	0.000	14.6	0.369	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.074(	0.165)
SCOLARMI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	0.0	0.000	2.9(	6.5)	0.001(	0.002)
SCOLBONN	0.0	0.000	14.6	0.044	14.6	0.018	0.0	0.000	14.6	0.095	8.8(	8.0)	0.031(	0.040)
SIGAMATH	43.9	0.294	43.9	0.139	43.9	0.203	14.6	0.139	14.6	0.025	32.2(	16.0)	0.160(	0.099)
SPIOBOMB	58.5	0.010	190.2	0.022	131.7	0.026	131.7	0.031	131.7	0.025	128.7(	46.7)	0.023(	0.008)
SPIOFILI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.012	8.8(	19.6)	0.002(	0.005)
STHELIMI	0.0	0.000	0.0	0.000	14.6	0.218	0.0	0.000	14.6	0.091	5.9(	8.0)	0.062(	0.096)
MISCELLANEOUS														
ANTHOZOA	29.3	0.003	0.0	0.000	29.3	0.102	14.6	0.042	29.3	0.032	20.5(	13.1)	0.036(	0.041)
NEMERTIN	43.9	0.006	43.9	0.026	102.4	0.032	131.7	1.797	58.5	0.032	76.1(	39.3)	0.379(	0.793)
PHORONID	0.0	0.000	14.6	0.006	14.6	0.006	14.6	0.006	14.6	0.006	11.7(	6.5)	0.005(	0.003)
PLATWORM	0.0	0.000	29.3	0.123	14.6	0.013	0.0	0.000	0.0	0.000	8.8(	13.1)	0.027(	0.054)
5	7534.4	16.152	7549.1	21.140	7139.4	18.094	6334.8	66.483	7549.1	61.856	7221.4(	525.7)	36.745(	25.151)
NSPC	42		44		41		38		45					
SH-W	2.039		2.089		2.047		2.152		2.055					
SIMP	0.322		0.305		0.301		0.268		0.334					

STATION : SM37
GEOGR. POS. : 55° 00" 15' N 02° 59" 78' E
DATE : 05/05/93
DEPTH m : 25
Median Grain: 192.44
Perc. Mud. : 1.15

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPEBREV	0.0	0.000	0.0	0.000	14.6	0.053	0.0	0.000	0.0	0.000	2.9(	6.5)	0.011(	0.024)
ARGIHAMA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
ATYLFALC	14.6	0.007	14.6	0.007	29.3	0.007	14.6	0.007	0.0	0.000	14.6(	10.3)	0.006(	0.003)
ATYLSWAM	14.6	0.007	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.003(	0.004)
BATHELEG	716.9	0.094	848.5	0.140	775.4	0.126	848.5	0.111	365.8	0.057	711.0(	200.8)	0.106(	0.032)
BATHGUIL	614.5	0.119	482.8	0.066	877.8	0.178	790.0	0.135	336.5	0.066	620.3(	220.6)	0.113(	0.048)
BATHTENU	102.4	0.029	43.9	0.016	43.9	0.012	73.2	0.019	117.0	0.035	76.1(	33.4)	0.022(	0.010)
DIASBRAD	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.078	0.0	0.000	5.9(	13.1)	0.016(	0.035)
HIPPDENT	14.6	0.116	14.6	0.007	43.9	0.078	14.6	0.007	0.0	0.000	17.6(	16.0)	0.042(	0.052)
IPHITRIS	73.2	0.056	0.0	0.000	14.6	0.013	87.8	0.080	73.2	0.061	49.7(	39.5)	0.042(	0.034)
LEUCINCI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
MEGAAGIL	58.5	0.029	43.9	0.022	0.0	0.000	73.2	0.037	43.9	0.022	43.9(	27.4)	0.022(	0.014)
PERILONG	14.6	0.007	14.6	0.007	14.6	0.007	14.6	0.007	0.0	0.000	11.7(	6.5)	0.006(	0.003)
PONTALTA	43.9	0.022	117.0	0.059	29.3	0.015	102.4	0.051	102.4	0.051	79.0(	39.5)	0.040(	0.020)
PSEULONG	29.3	0.015	73.2	0.037	14.6	0.007	87.8	0.044	73.2	0.037	55.6(	31.7)	0.028(	0.016)
PSEUSIMI	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
SIPHKROY	58.5	0.009	14.6	0.007	29.3	0.015	0.0	0.000	14.6	0.007	23.4(	22.2)	0.008(	0.005)
TRYPSARS	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.015	5.9(	13.1)	0.003(	0.007)
UROTPOSE	87.8	0.022	160.9	0.038	58.5	0.013	204.8	0.048	29.3	0.015	108.3(	72.9)	0.027(	0.015)
ECHINODERMATA														
ACROBRAC	219.4	2.765	131.7	2.551	219.4	1.551	190.2	3.052	117.0	1.053	175.6(	48.5)	2.194(	0.852)
ECHICORD	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	5.265	2.9(	6.5)	1.053(	2.355)
ECHIPUSI	14.6	0.006	87.8	0.032	43.9	0.015	117.0	0.063	29.3	0.009	58.5(	42.7)	0.025(	0.024)
OPHIALBI	14.6	0.009	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.004)
MOLLUSCA														
ABRAPRIS	14.6	0.053	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.011(	0.024)
ACTATORN	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.085	2.9(	6.5)	0.017(	0.038)
CYLICYLI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
DOSILUPI	14.6	0.009	0.0	0.000	29.3	0.098	0.0	0.000	0.0	0.000	8.8(	13.1)	0.021(	0.043)
ENSIENSI	29.3	4.152	29.3	2.714	0.0	0.000	0.0	0.000	0.0	0.000	11.7(	16.0)	1.373(	1.948)
GARIFERV	29.3	0.336	14.6	0.158	0.0	0.000	14.6	0.029	0.0	0.000	11.7(	12.2)	0.105(	0.145)
MONTFERR	14.6	0.022	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.094	8.8(	13.1)	0.023(	0.041)
MYSEBIDE	321.9	0.045	204.8	0.032	117.0	0.031	160.9	0.035	58.5	0.007	172.6(	99.4)	0.030(	0.014)
NATIALDE	0.0	0.000	73.2	0.035	14.6	0.015	29.3	0.091	87.8	0.082	41.0(	37.9)	0.044(	0.040)
PHILSPEC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
TELLFABU	29.3	0.277	0.0	0.000	14.6	0.016	73.2	0.414	29.3	0.016	29.3(	27.4)	0.145(	0.190)
THRAPHAS	14.6	0.006	14.6	0.003	0.0	0.000	0.0	0.000	29.3	0.007	11.7(	12.2)	0.003(	0.003)
POLYCHAETA														
ANAIMACU	14.6	0.004	29.3	0.035	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.008(	0.015)
ANAISUBU	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.013	0.0	0.000	8.8(	19.6)	0.003(	0.006)
ARICMINU	43.9	0.004	0.0	0.000	14.6	0.000	14.6	0.000	43.9	0.000	23.4(	19.6)	0.001(	0.002)
CHAESETO	160.9	0.013	190.2	0.022	263.3	0.026	190.2	0.016	234.1	0.022	207.7(	40.6)	0.020(	0.005)
GLYCALBA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.506	0.0	0.000	2.9(	6.5)	0.101(	0.226)
GONIMACU	29.3	0.132	58.5	0.102	58.5	0.243	29.3	0.086	58.5	0.145	46.8(	16.0)	0.142(	0.061)
GYPTCAPE	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.004	0.0	0.000	5.9(	13.1)	0.001(	0.002)
HARMLUNU	14.6	0.004	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.002(	0.002)
LANICONC	102.4	0.006	87.8	0.004	29.3	0.249	219.4	0.736	102.4	0.004	108.3(	69.1)	0.200(	0.318)
MAGEPAPI	131.7	0.075	29.3	0.007	87.8	0.072	117.0	0.085	102.4	0.025	93.6(	39.5)	0.053(	0.034)
NEPHCIRR	131.7	0.167	146.3	0.252	131.7	0.257	307.2	0.241	87.8	0.102	160.9(	84.7)	0.204(	0.068)
NEPHHOMB	0.0	0.000	58.5	1.501	73.2	0.470	87.8	0.797	29.3	0.237	49.7(	35.2)	0.601(	0.583)
NOTOLATE	0.0	0.000	14.6	0.307	14.6	0.135	29.3	0.263	29.3	0.427	17.6(	12.2)	0.226(	0.164)
OPHELIMA	14.6	0.010	43.9	0.047	0.0	0.000	43.9	0.056	14.6	0.042	23.4(	19.6)	0.031(	0.024)
OPHIFLEX	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
OWENFUSI	204.8	0.183	219.4	0.271	102.4	0.133	278.0	0.388	146.3	0.170	190.2(	67.8)	0.229(	0.102)
PECTAURI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.075	2.9(	6.5)	0.015(	0.033)
PECTKORE	14.6	0.411	0.0	0.000	0.0	0.000	29.3	0.882	0.0	0.000	8.8(	13.1)	0.259(	0.391)
PHOLMINU	29.3	0.007	14.6	0.006	0.0	0.000	14.6	0.006	0.0	0.000	11.7(	12.2)	0.004(	0.004)
SCOLBONN	14.6	0.162	14.6	0.252	14.6	0.050	73.2	0.241	58.5	0.394	35.1(	28.5)	0.220(	0.126)
SCOLS°UA	14.6	0.237	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.047(	0.106)
SIGAMATH	43.9	0.967	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.186	14.6(	20.7)	0.231(	0.419)
SPIOBOMB	687.6	0.138	599.8	0.219	746.1	0.465	1009.5	0.133	468.2	0.135	702.2(	201.1)	0.218(	0.143)
SPIOFILI	29.3	0.006	14.6	0.006	0.0	0.000	14.6	0.010	14.6	0.016	14.6(	10.3)	0.008(	0.006)
STHELIMI	0.0	0.000	0.0	0.000	14.6	0.095	0.0	0.000	0.0	0.000	2.9(	6.5)	0.019(	0.043)
STREWEBS	0.0	0.000	0.0	0.000	29.3	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.000(	0.000)
MISCELLANEOUS														
ANTHOZOA	160.9	0.209	131.7	1.764	73.2	0.388	87.8	0.097	73.2	0.097	105.3(	39.3)	0.511(	0.711)
NEMERTIN	73.2	0.022	43.9	0.075	43.9	0.171	204.8	0.026	73.2	0.019	87.8(	67.0)	0.063(	0.065)
PHORONID	0.0	0.000	0.0	0.000	43.9	0.018	0.0	0.000	0.0	0.000	8.8(	19.6)	0.004(	0.008)
5	4476.8	10.968	4140.3	10.826	4125.7	5.020	5793.5	8.904	3204.0	9.087	4348.0(	936.4)	8.961(	2.401)
NSPC	43		38		34		40		38					
SH-W	2.942		2.869		2.585		2.932		3.132					
SIMP	0.082		0.089		0.122		0.083		0.060					

STATION : SM1
GEOGR. POS. : 52° 45' 0' N 04° 30' 9' E
DATE : 24/05/93
DEPTH m : 20
Median Grain: 224.58
Perc. Mud. : 0.68

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLSWAM	0.0	0.000	14.6	0.007	0.0	0.000	14.6	0.007	0.0	0.000	5.9(	8.0)	0.003(	0.004)
BATHGUIL	0.0	0.000	14.6	0.022	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.004(	0.010)
DIASBRAD	0.0	0.000	0.0	0.000	14.6	0.031	0.0	0.000	0.0	0.000	2.9(	6.5)	0.006(	0.014)
MICRMACU	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
TRYPSARS	0.0	0.000	14.6	0.009	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.004)
UROTPOSE	248.7	0.091	395.0	0.143	248.7	0.086	424.3	0.149	29.3	0.013	269.2(	156.8)	0.097(	0.055)
ECHINODERMATA														
AMPHIURI	29.3	0.004	29.3	0.009	14.6	0.000	0.0	0.000	43.9	0.006	23.4(	16.7)	0.004(	0.004)
ECHICORD	43.9	25.521	14.6	4.943	73.2	32.476	43.9	17.026	0.0	0.000	35.1(	28.5)	15.993(	13.614)
MOLLUSCA														
ENSIDIRE	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	17.383	2.9(	6.5)	3.477(	7.774)
MONTFERR	263.3	0.274	14.6	0.029	248.7	0.233	131.7	0.099	0.0	0.000	131.7(	124.6)	0.127(	0.122)
MYSEBIDE	73.2	0.037	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	17.6(	31.7)	0.009(	0.016)
NATIALDE	0.0	0.000	14.6	0.195	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.039(	0.087)
SPISSUBT	0.0	0.000	3247.9	292.936	1989.7	179.098	3935.5	350.532	3160.1	180.309	2466.6(	1546.0)	200.575(	134.276)
TELLFABU	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	1.933	5.9(	13.1)	0.387(	0.864)
POLYCHAETA														
ANAIMACU	0.0	0.000	117.0	0.038	14.6	0.012	0.0	0.000	0.0	0.000	26.3(	51.1)	0.010(	0.017)
ANAISUBU	14.6	0.006	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
CAPICAPI	0.0	0.000	14.6	0.000	102.4	0.019	87.8	0.019	131.7	0.037	67.3(	57.2)	0.015(	0.015)
HARMLUNU	14.6	0.044	14.6	0.007	14.6	0.013	0.0	0.000	0.0	0.000	8.8(	8.0)	0.013(	0.018)
MAGEPAPI	0.0	0.000	14.6	0.037	0.0	0.000	29.3	0.097	0.0	0.000	8.8(	13.1)	0.027(	0.042)
NEPHCIRR	29.3	0.004	14.6	0.252	0.0	0.000	0.0	0.000	58.5	0.170	20.5(	24.5)	0.085(	0.118)
NEPHHOMB	14.6	0.019	14.6	0.067	14.6	0.035	14.6	0.031	0.0	0.000	11.7(	6.5)	0.030(	0.025)
SCOLBONN	0.0	0.000	0.0	0.000	29.3	0.587	0.0	0.000	0.0	0.000	5.9(	13.1)	0.117(	0.262)
SPIOBOMB	43.9	0.116	0.0	0.000	14.6	0.000	43.9	0.041	14.6	0.061	23.4(	19.6)	0.044(	0.048)
MISCELLANEOUS														
NEMERTIN	0.0	0.000	0.0	0.000	29.3	0.042	29.3	0.048	0.0	0.000	11.7(	16.0)	0.018(	0.025)
5	775.4	26.115	3950.1	298.695	2823.6	212.638	4769.4	368.057	3481.9	199.912	3160.1(	1509.8)	221.083(	128.605)
NSPC	10		15		14		11		8					
SH-W	1.751		0.760		1.175		0.748		0.462					
SIMP	0.223		0.686		0.512		0.689		0.825					

STATION : META1
GEOGR. POS. : 53° 00' 01' N 03° 55' 16' E
DATE : 04/05/93
DEPTH m : 27
Median Grain: 251.01
Perc. Mud. : 0.58

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHELEG	146.3	0.073	131.7	0.034	175.6	0.056	219.4	0.051	160.9	0.035	166.8(	33.7)	0.050(	0.016)
BATHGUIL	29.3	0.031	0.0	0.000	0.0	0.000	14.6	0.018	0.0	0.000	8.8(	13.1)	0.010(	0.014)
HIPPDENT	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
MEGAAGIL	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	43.9	0.022	8.8(	19.6)	0.004(	0.010)
PONTALTA	14.6	0.007	29.3	0.015	14.6	0.007	0.0	0.000	0.0	0.000	11.7(	12.2)	0.006(	0.006)
PSEULONG	58.5	0.029	29.3	0.015	58.5	0.029	0.0	0.000	29.3	0.015	35.1(	24.5)	0.018(	0.012)
PSEUSIMI	29.3	0.015	14.6	0.007	29.3	0.015	0.0	0.000	14.6	0.007	17.6(	12.2)	0.009(	0.006)
THIASCUT	14.6	0.334	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.067(	0.149)
TRYPSARS	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
UROTPOSE	0.0	0.000	14.6	0.003	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.001)
ECHINODERMATA														
ECHICORD	14.6	3.941	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.788(	1.763)
ECHIPUSI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
OPHIALBI	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	14.6	0.000	5.9(	8.0)	0.000(	0.000)
MOLLUSCA														
DONAVITT	58.5	3.318	43.9	2.993	14.6	0.053	14.6	1.914	14.6	3.293	29.3(	20.7)	2.314(	1.388)
ENSIENSI	0.0	0.000	14.6	10.348	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	2.070(	4.628)
NATIALDE	14.6	0.016	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.007)
TELLFABU	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
POLYCHAETA														
ARICMINU	43.9	0.006	102.4	0.022	73.2	0.013	58.5	0.013	14.6	0.004	58.5(	32.7)	0.012(	0.007)
CHAESETO	0.0	0.000	0.0	0.000	14.6	0.004	14.6	0.000	0.0	0.000	5.9(	8.0)	0.001(	0.002)
GONIMACU	14.6	0.031	43.9	0.203	0.0	0.000	14.6	0.089	0.0	0.000	14.6(	17.9)	0.065(	0.086)
MAGEPAPI	14.6	0.041	14.6	0.023	0.0	0.000	0.0	0.000	58.5	0.167	17.6(	24.0)	0.046(	0.070)
NEPHCIRR	190.2	0.357	58.5	0.303	102.4	0.328	131.7	0.183	131.7	0.246	122.9(	48.1)	0.283(	0.069)
NERELONG	0.0	0.000	14.6	0.145	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.029(	0.065)
OPHELIMA	14.6	0.022	29.3	0.064	14.6	0.010	0.0	0.000	0.0	0.000	11.7(	12.2)	0.019(	0.027)
SCOLARMI	87.8	0.206	87.8	0.263	43.9	0.129	131.7	0.268	175.6	0.446	105.3(	50.0)	0.262(	0.117)
SCOLBONN	0.0	0.000	14.6	0.282	0.0	0.000	14.6	0.079	0.0	0.000	5.9(	8.0)	0.072(	0.122)
SPIOBOMB	58.5	0.004	117.0	0.016	58.5	0.000	131.7	0.010	102.4	0.010	93.6(	33.7)	0.008(	0.006)
SPIOFILI	87.8	0.016	43.9	0.004	43.9	0.000	14.6	0.000	43.9	0.004	46.8(	26.2)	0.005(	0.007)
MISCELLANEOUS														
ANTHOZOA	29.3	0.013	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.006)
NEMERTIN	29.3	0.022	0.0	0.000	29.3	0.026	0.0	0.000	0.0	0.000	11.7(	16.0)	0.010(	0.013)
5	951.0	8.482	819.3	14.741	687.6	0.677	790.0	2.632	819.3	4.250	813.4(	94.0)	6.157(	5.594)
NSPC	19		18		14		13		13					
SH-W	2.584		2.590		2.319		2.035		2.184					
SIMP	0.086		0.077		0.108		0.153		0.124					

Appendix - 2 Biomonitoring 1993

STATION : SM20
GEOGR. POS. : 53° 29" 17' N 03° 00" 7' E
DATE : 04/05/93
DEPTH m : 32
Median Grain: 134.29
Perc. Mud. : 7.48

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPEBREV	0.0	0.000	14.6	0.066	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.013(	0.029)
ARGIHAMA	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
CALLSUBT	102.4	4.287	29.3	0.808	117.0	5.159	43.9	5.653	14.6	3.191	61.4(	45.6)	3.819(	1.926)
HIPPDENT	29.3	0.015	0.0	0.000	14.6	0.007	0.0	0.000	14.6	0.007	11.7(	12.2)	0.006(	0.006)
LEUCINCI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PERILONG	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEUSIMI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	14.6	0.007	5.9(	8.0)	0.003(	0.004)
ECHINODERMATA														
AMPHFILI	0.0	0.000	29.3	0.667	14.6	0.000	43.9	0.004	29.3	0.000	23.4(	16.7)	0.134(	0.298)
ECHICORD	43.9	9.802	102.4	25.117	58.5	13.536	102.4	24.347	117.0	28.969	84.9(	31.7)	20.354(	8.226)
OPHIALBI	0.0	0.000	0.0	0.000	29.3	0.067	0.0	0.000	29.3	0.000	11.7(	16.0)	0.013(	0.030)
MOLLUSCA														
ABRAALBA	0.0	0.000	0.0	0.000	14.6	0.000	14.6	0.000	29.3	0.000	11.7(	12.2)	0.000(	0.000)
ABRANITI	0.0	0.000	43.9	0.037	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	19.6)	0.007(	0.016)
CULTPELL	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MONTFERR	43.9	0.006	117.0	0.020	73.2	0.020	73.2	0.050	14.6	0.003	64.4(	38.2)	0.020(	0.019)
MYSEBIDE	0.0	0.000	0.0	0.000	14.6	0.003	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.001)
NATIALDE	29.3	0.004	43.9	0.023	29.3	0.009	29.3	0.016	14.6	0.003	29.3(	10.3)	0.011(	0.009)
NUCUTURG	29.3	0.020	58.5	0.020	73.2	0.176	14.6	0.012	29.3	0.094	41.0(	24.0)	0.064(	0.070)
TELLFABU	14.6	0.000	0.0	0.000	0.0	0.000	29.3	0.010	0.0	0.000	8.8(	13.1)	0.002(	0.005)
VENUSTRI	0.0	0.000	14.6	3.628	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.726(	1.623)
POLYCHAETA														
CHAESETO	29.3	0.013	0.0	0.000	14.6	0.004	14.6	0.000	43.9	0.004	20.5(	16.7)	0.004(	0.005)
GONIMACU	14.6	0.010	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	5.9(	8.0)	0.002(	0.005)
MAGEPAPI	87.8	0.026	43.9	0.026	117.0	0.038	102.4	0.037	146.3	0.032	99.5(	37.9)	0.032(	0.006)
NEPHHOMB	58.5	1.612	87.8	0.198	131.7	0.290	43.9	0.019	73.2	0.023	79.0(	33.7)	0.428(	0.672)
OPHIFLEX	0.0	0.000	14.6	0.044	14.6	0.007	0.0	0.000	0.0	0.000	5.9(	8.0)	0.010(	0.019)
PHOLMINU	0.0	0.000	0.0	0.000	29.3	0.000	43.9	0.010	43.9	0.004	23.4(	22.2)	0.003(	0.005)
POECSERP	0.0	0.000	14.6	0.006	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
SCOLARMI	14.6	0.006	43.9	0.012	58.5	0.013	14.6	0.006	73.2	0.031	41.0(	26.2)	0.013(	0.010)
SIGAMATH	0.0	0.000	14.6	0.012	29.3	0.006	43.9	0.006	29.3	0.263	23.4(	16.7)	0.057(	0.115)
SPIOBOMB	29.3	0.004	73.2	0.332	0.0	0.000	14.6	0.004	0.0	0.000	23.4(	30.3)	0.068(	0.148)
SPIOFILI	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
STHELIMI	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
MISCELLANEOUS														
ANTHOZOA	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	1.921	5.9(	13.1)	0.384(	0.859)
NEMERTIN	29.3	0.010	73.2	3.994	58.5	0.022	29.3	0.010	43.9	0.013	46.8(	19.1)	0.810(	1.780)
PHORONID	29.3	0.012	73.2	0.029	58.5	0.023	102.4	0.041	14.6	0.006	55.6(	34.9)	0.022(	0.014)
5	614.5	15.840	892.4	35.039	980.2	19.395	804.7	30.240	819.3	34.572	822.2(	135.4)	27.017(	8.872)
NSPC	17		18		21		20		20					
SH-W	2.637		2.690		2.759		2.743		2.705					
SIMP	0.064		0.062		0.063		0.061		0.070					

Appendix - 2 Biomonitoring 1993

STATION : N2
GEOGR. POS. : 52° 15" 46' N 04° 24" 27" E
DATE : 26/04/93
DEPTH m : 13
Median Grain: 239.68
Perc. Mud. : 3.42

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLSWAM	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
DIASBRAD	29.3	0.019	14.6	0.029	14.6	0.007	0.0	0.000	0.0	0.000	11.7(	12.2)	0.011(	0.013)
MICRMACU	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	14.6	0.007	5.9(	8.0)	0.003(	0.004)
UROTPOSE	14.6	0.016	14.6	0.007	131.7	0.038	14.6	0.007	58.5	0.012	46.8(	51.1)	0.016(	0.013)
ECHINODERMATA														
AMPHIURI	29.3	0.003	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.001)
ECHICORD	29.3	1.513	29.3	0.954	43.9	4.579	0.0	0.000	14.6	0.954	23.4(	16.7)	1.600(	1.752)
MOLLUSCA														
ENSIDIRE	29.3	35.497	14.6	5.741	14.6	8.727	14.6	6.569	0.0	0.000	14.6(	10.3)	11.307(	13.902)
MONTFERR	58.5	0.022	73.2	0.045	117.0	0.113	0.0	0.000	58.5	0.037	61.4(	41.9)	0.043(	0.042)
MYSEBIDE	0.0	0.000	0.0	0.000	14.6	0.003	14.6	0.007	0.0	0.000	5.9(	8.0)	0.002(	0.003)
SPISSUBT	0.0	0.000	29.3	0.888	14.6	0.894	14.6	0.192	14.6	0.249	14.6(	10.3)	0.444(	0.418)
TELLFABU	14.6	0.044	117.0	1.030	58.5	0.648	14.6	0.297	146.3	2.370	70.2(	59.8)	0.878(	0.913)
TELLTENU	0.0	0.000	0.0	0.000	14.6	0.127	0.0	0.000	14.6	0.088	5.9(	8.0)	0.043(	0.061)
POLYCHAETA														
ANAIMACU	0.0	0.000	29.3	0.012	14.6	0.010	0.0	0.000	0.0	0.000	8.8(	13.1)	0.004(	0.006)
CAPICAPI	0.0	0.000	14.6	0.000	43.9	0.000	0.0	0.000	29.3	0.004	17.6(	19.1)	0.001(	0.002)
CHAESETO	14.6	0.000	14.6	0.006	0.0	0.000	0.0	0.000	14.6	0.000	8.8(	8.0)	0.001(	0.003)
EUMISANG	14.6	0.006	0.0	0.000	14.6	0.004	0.0	0.000	14.6	0.004	8.8(	8.0)	0.003(	0.003)
HARMJUV	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
HARMLUNU	0.0	0.000	29.3	0.026	14.6	0.025	14.6	0.023	14.6	0.006	14.6(	10.3)	0.016(	0.012)
LANICONC	0.0	0.000	73.2	3.472	131.7	6.395	14.6	0.415	87.8	3.535	61.4(	54.2)	2.763(	2.619)
MAGEPAPI	14.6	0.004	102.4	0.086	73.2	0.061	0.0	0.000	58.5	0.091	49.7(	42.1)	0.049(	0.044)
NEPHCIRR	87.8	0.149	219.4	0.521	146.3	0.369	29.3	0.101	204.8	0.500	137.5(	79.9)	0.328(	0.195)
NEPHHOMB	0.0	0.000	43.9	0.240	29.3	0.345	14.6	0.022	43.9	1.618	26.3(	19.1)	0.445(	0.672)
NOTOLATE	14.6	0.996	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.199(	0.446)
SCOLARMI	14.6	0.079	29.3	0.029	43.9	0.064	14.6	0.158	29.3	0.016	26.3(	12.2)	0.069(	0.056)
SCOLBONN	0.0	0.000	43.9	0.218	0.0	0.000	14.6	0.070	58.5	0.253	23.4(	26.6)	0.108(	0.120)
SPIOBOMB	14.6	0.025	73.2	0.075	87.8	0.075	14.6	0.023	58.5	0.041	49.7(	33.7)	0.048(	0.026)
SPIOFILI	0.0	0.000	14.6	0.004	14.6	0.004	0.0	0.000	0.0	0.000	5.9(	8.0)	0.002(	0.002)
MISCELLANEOUS														
ANTHOZOA	0.0	0.000	0.0	0.000	29.3	15.066	0.0	0.000	29.3	5.365	11.7(	16.0)	4.086(	6.563)
NEMERTIN	102.4	0.300	58.5	0.222	29.3	0.016	29.3	0.032	29.3	0.035	49.7(	32.1)	0.121(	0.131)
5	482.8	38.673	1038.7	13.606	1126.5	37.579	219.5	7.918	1009.5	15.192	775.4(	400.7)	22.593(	14.440)
NSPC	15		20		24		13		21					
SH-W	2.422		2.656		2.817		2.523		2.679					
SIMP	0.087		0.081		0.064		0.019		0.080					

Appendix - 2 Biomonitoring 1993

STATION : N10
GEOGR. POS. : 52° 17" 88' N 04° 18" 16' E
DATE : 26/04/93
DEPTH m : 20
Median Grain: 300.61
Perc. Mud. : 2.18

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
AMPEBREV	14.6	0.080	0.0	0.000	0.0	0.000	14.6	0.088	0.0	0.000	5.9(	8.0)	0.034(	0.046)
ATYLFALC	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
ATYLSWAM	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHGUIL	29.3	0.048	43.9	0.048	29.3	0.044	58.5	0.110	29.3	0.069	38.0(	13.1)	0.064(	0.027)
DIASBRAD	14.6	0.003	29.3	0.015	14.6	0.009	0.0	0.000	0.0	0.000	11.7(	12.2)	0.005(	0.006)
LEUCINCI	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEULONG	0.0	0.000	58.5	0.029	0.0	0.000	29.3	0.015	0.0	0.000	17.6(	26.2)	0.009(	0.013)
UROTPOSE	907.1	0.373	204.8	0.121	321.9	0.091	175.6	0.104	351.1	0.162	392.1(	297.4)	0.170(	0.117)
ECHINODERMATA														
ECHICORD	0.0	0.000	14.6	3.972	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.794(	1.776)
MOLLUSCA														
ENSIDIRE	0.0	0.000	0.0	0.000	0.0	0.000	29.3	51.373	0.0	0.000	5.9(	13.1)	10.275(	22.975)
MONTFERR	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MYSEBIDE	746.1	0.092	0.0	0.000	14.6	0.000	0.0	0.000	43.9	0.010	160.9(	327.6)	0.020(	0.040)
POLYCHAETA														
ANAIMACU	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.044	2.9(	6.5)	0.009(	0.020)
ANAIMUCO	29.3	0.035	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.007(	0.016)
CAPICAPI	160.9	0.016	0.0	0.000	0.0	0.000	14.6	0.006	29.3	0.004	41.0(	68.2)	0.005(	0.007)
ETEOLONG	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
EUMISANG	117.0	0.120	0.0	0.000	29.3	0.012	14.6	0.000	29.3	0.012	38.0(	45.8)	0.029(	0.051)
HARMLUNU	351.1	0.527	0.0	0.000	204.8	0.380	0.0	0.000	0.0	0.000	111.2(	160.8)	0.181(	0.254)
LANICONC	629.1	21.314	14.6	0.135	234.1	11.322	14.6	0.101	29.3	0.464	184.3(	265.5)	6.667(	9.493)
MAGEPAPI	14.6	0.006	29.3	0.086	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.018(	0.038)
NEPHCAEC	14.6	0.203	0.0	0.000	14.6	10.858	0.0	0.000	0.0	0.000	5.9(	8.0)	2.212(	4.834)
NEPHCIRR	424.3	3.112	117.0	0.170	204.8	1.513	190.2	1.233	131.7	1.039	213.6(	123.5)	1.413(	1.074)
NEPHHOMB	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.050	2.9(	6.5)	0.010(	0.022)
NERELONG	87.8	6.826	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	17.6(	39.3)	1.365(	3.053)
NOTOLATE	14.6	0.016	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.007)
PECTKORE	0.0	0.000	0.0	0.000	14.6	0.590	0.0	0.000	14.6	1.371	5.9(	8.0)	0.392(	0.604)
PHOLMINU	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
SCOLARMI	0.0	0.000	14.6	0.108	0.0	0.000	0.0	0.000	14.6	0.127	5.9(	8.0)	0.047(	0.065)
SIGAMATH	29.3	0.230	0.0	0.000	14.6	0.089	0.0	0.000	14.6	0.290	11.7(	12.2)	0.122(	0.133)
SPIOBOMB	14.6	0.025	14.6	0.000	73.2	0.026	14.6	0.000	29.3	0.022	29.3(	25.3)	0.015(	0.013)
SPIOFILI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.006	5.9(	13.1)	0.001(	0.003)
MISCELLANEOUS														
NEMERTIN	160.9	3.412	i02.4	1.323	58.5	1.780	58.5	2.726	190.2	5.944	114.1(	59.8)	3.037(	1.817)
5	3803.8	36.448	643.7	6.007	1272.8	26.736	614.5	55.755	965.6	9.613	1460.1(	1337.4)	26.912(	20.366)
NSPC	21		11		16		11		15					
SH-W	2.190		1.993		2.137		1.904		2.053					
SIMP	0.146		0.160		0.147		0.184		0.186					

STATION : N30
GEOGR. POS. : 52° 23" 31' N 04° 02" 89' E
DATE : 27/04/93
DEPTH m : 25
Median Grain: 319.77
Perc. Mud. : 0.73

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHGUIL	29.3	0.056	0.0	0.000	14.6	0.026	0.0	0.000	0.0	0.000	8.8(	13.1)	0.016(	0.025)
CALLTYRR	0.0	0.000	14.6	0.012	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
MEGAAGIL	43.9	0.022	29.3	0.015	29.3	0.015	58.5	0.029	14.6	0.007	35.1(	16.7)	0.018(	0.008)
PSEULONG	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	14.6	0.007	8.8(	13.1)	0.004(	0.007)
PSEUSIMI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
UROTPOSE	29.3	0.029	117.0	0.066	29.3	0.022	146.3	0.086	160.9	0.083	96.6(	63.4)	0.057(	0.030)
ECHINODERMATA														
ACROBRAC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
ECHICORD	29.3	15.705	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	3.141(	7.024)
MOLLUSCA														
NATIALDE	43.9	0.089	0.0	0.000	43.9	0.126	29.3	0.095	29.3	0.037	29.3(	17.9)	0.069(	0.050)
SPISSPEC	0.0	0.000	14.6	0.079	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.016(	0.035)
POLYCHAETA														
ANAIMACU	14.6	0.019	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.004(	0.009)
ANAISUBU	0.0	0.000	14.6	0.016	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.007)
ARICMINU	146.3	0.016	14.6	0.000	58.5	0.010	58.5	0.013	102.4	0.013	76.1(	50.0)	0.011(	0.006)
CAPICAPI	43.9	0.007	29.3	0.004	14.6	0.004	43.9	0.012	14.6	0.004	29.3(	14.6)	0.006(	0.003)
ETEOLONG	58.5	0.037	14.6	0.018	14.6	0.012	58.5	0.095	14.6	0.007	32.2(	24.0)	0.034(	0.036)
HESIAUGE	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MAGEPAPI	14.6	0.199	0.0	0.000	14.6	0.012	0.0	0.000	0.0	0.000	5.9(	8.0)	0.042(	0.088)
NEPHCIRR	263.3	3.808	395.0	4.003	219.4	3.217	234.1	3.959	175.6	3.438	257.5(	83.1)	3.685(	0.343)
NERELONG	0.0	0.000	14.6	0.048	0.0	0.000	14.6	0.712	14.6	0.121	8.8(	8.0)	0.176(	0.304)
OPHELIMA	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.004	5.9(	13.1)	0.001(	0.002)
SCOLARMI	14.6	0.018	29.3	0.585	14.6	0.016	0.0	0.000	14.6	0.253	14.6(	10.3)	0.174(	0.253)
SCOLBONN	43.9	0.408	58.5	0.712	102.4	0.724	14.6	0.158	43.9	0.328	52.7(	32.1)	0.466(	0.247)
SCOLS"UA	0.0	0.000	0.0	0.000	29.3	0.252	0.0	0.000	0.0	0.000	5.9(	13.1)	0.050(	0.113)
SPIOBOMB	658.3	0.246	555.9	0.805	497.4	0.429	994.8	1.740	351.1	0.379	611.5(	241.4)	0.720(	0.607)
SPIOFILI	43.9	0.035	29.3	0.023	0.0	0.000	0.0	0.000	0.0	0.000	14.6(	20.7)	0.012(	0.017)
TRAVFORB	58.5	1.344	14.6	0.193	14.6	0.107	0.0	0.000	0.0	0.000	17.6(	24.0)	0.329(	0.573)
MISCELLANEOUS														
NEMERTIN	102.4	0.312	87.8	0.148	0.0	0.000	175.6	1.129	204.8	2.025	114.1(	80.4)	0.723(	0.849)
5	1638.6	22.350	1477.6	6.742	1097.3	4.971	1858.0	8.036	1185.0	6.708	1451.3(	315.2)	9.761(	7.121)
NSPC	17		18		14		13		14					
SH-W	2.114		1.971		1.822		1.652		2.060					
SIMP	0.199		0.219		0.252		0.316		0.159					

STATION : N50
GEOGR. POS. : 52° 28" 91' N 03° 47" 09' E
DATE : 27/04/93
DEPTH m : 31
Median Grain: 279.90
Perc. Mud. : 0.94

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHELEG	14.6	0.007	29.3	0.018	0.0	0.000	0.0	0.000	29.3	0.019	14.6(	14.6)	0.009(	0.009)
BATHGUIL	29.3	0.019	0.0	0.000	43.9	0.086	14.6	0.060	29.3	0.061	23.4(	16.7)	0.045(	0.035)
CALLTYRR	0.0	0.000	0.0	0.000	14.6	5.393	0.0	0.000	14.6	0.241	5.9(	8.0)	1.127(	2.387)
DIASBRAD	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.003	2.9(	6.5)	0.001(	0.001)
MEGAAGIL	43.9	0.022	0.0	0.000	43.9	0.022	29.3	0.015	29.3	0.015	29.3(	17.9)	0.015(	0.009)
PERILONG	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PSEULONG	29.3	0.015	0.0	0.000	29.3	0.015	14.6	0.007	29.3	0.003	20.5(	13.1)	0.008(	0.007)
PSEUSIMI	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
UROTBREV	14.6	0.026	14.6	0.031	73.2	0.108	0.0	0.000	14.6	0.022	23.4(	28.5)	0.037(	0.041)
UROTPOSE	0.0	0.000	0.0	0.000	43.9	0.018	29.3	0.015	0.0	0.000	14.6(	20.7)	0.006(	0.009)
ECHINODERMATA														
ECHICORD	0.0	0.000	14.6	3.704	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.741(	1.657)
OPHIALBI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	29.3	0.000	8.8(	13.1)	0.000(	0.000)
MOLLUSCA														
ENSIENSI	0.0	0.000	0.0	0.000	14.6	6.639	0.0	0.000	0.0	0.000	2.9(	6.5)	1.328(	2.969)
MACTCORA	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
NATIALDE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
POLYCHAETA														
ARICJEFF	0.0	0.000	0.0	0.000	43.9	0.004	87.8	0.004	43.9	0.004	35.1(	36.7)	0.003(	0.002)
ARICMINU	29.3	0.012	43.9	0.006	0.0	0.000	14.6	0.000	29.3	0.004	23.4(	16.7)	0.004(	0.005)
ETEOLACT	43.9	0.059	0.0	0.000	14.6	0.061	0.0	0.000	0.0	0.000	11.7(	19.1)	0.024(	0.033)
EXOGSPEC	29.3	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.002)
LANICONC	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
MAGEPAPI	0.0	0.000	0.0	0.000	14.6	0.010	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
NEPHCIRR	102.4	0.445	117.0	0.413	146.3	0.765	160.9	1.007	102.4	0.549	125.8(	26.6)	0.636(	0.249)
PHOLMINU	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
SCOLARMI	0.0	0.000	29.3	0.123	0.0	0.000	0.0	0.000	14.6	0.061	8.8(	13.1)	0.037(	0.055)
SCOLBONN	43.9	1.031	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.500	11.7(	19.1)	0.306(	0.460)
SCOLS"UA	0.0	0.000	29.3	0.730	0.0	0.000	14.6	0.059	0.0	0.000	8.8(	13.1)	0.158(	0.321)
SPIOBOMB	146.3	0.031	0.0	0.000	160.9	0.010	131.7	0.006	102.4	0.243	108.3(	64.3)	0.058(	0.104)
SPIOFILI	14.6	0.000	43.9	0.004	43.9	0.004	43.9	0.004	14.6	0.000	32.2(	16.0)	0.003(	0.002)
TRAVFORB	0.0	0.000	29.3	0.729	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.146(	0.326)
MISCELLANEOUS														
NEMERTIN	43.9	0.129	14.6	0.022	29.3	0.091	0.0	0.000	58.5	0.277	29.3(	23.1)	0.104(	0.110)
OLIGOCHA	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	5.9(	8.0)	0.000(	0.000)
PHORONID	0.0	0.000	14.6	0.006	0.0	0.000	29.3	0.012	0.0	0.000	8.8(	13.1)	0.004(	0.005)
5	614.5	1.807	409.6	5.793	716.9	13.227	629.1	1.195	585.2	2.003	591.1(	112.7)	4.805(	5.044)
NSPC	15		13		14		15		17					
SH-W	2.419		2.305		2.326		2.265		2.579					
SIMP	0.095		0.101		0.108		0.124		0.073					

STATION : N70
GEOGR. POS. : 52° 34" 15' N 03° 31" 90' E
DATE : 27/04/93
DEPTH m : 32
Median Grain: 284.72
Perc. Mud. : 0.00

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLSWAM	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHELEG	117.0	0.061	0.0	0.000	58.5	0.023	43.9	0.041	0.0	0.000	43.9(	48.5)	0.025(	0.027)
BATHGUIL	234.1	0.190	43.9	0.079	73.2	0.139	29.3	0.029	43.9	0.079	84.9(	84.9)	0.103(	0.062)
MEGAAGIL	29.3	0.015	43.9	0.022	0.0	0.000	29.3	0.015	14.6	0.007	23.4(	16.7)	0.012(	0.008)
PSEULONG	29.3	0.015	0.0	0.000	14.6	0.007	14.6	0.007	0.0	0.000	11.7(	12.2)	0.006(	0.006)
THIASCUT	0.0	0.000	14.6	0.746	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.149(	0.334)
UROTBREV	160.9	0.176	102.4	0.105	29.3	0.034	0.0	0.000	73.2	0.086	73.2(	62.9)	0.080(	0.068)
UROTPOSE	0.0	0.000	14.6	0.013	0.0	0.000	14.6	0.012	0.0	0.000	5.9(	8.0)	0.005(	0.007)
ECHINODERMATA														
ECHICORD	0.0	0.000	29.3	15.594	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	3.119(	6.974)
OPHIALBI	0.0	0.000	0.0	0.000	29.3	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.000(	0.000)
POLYCHAETA														
ARICMINU	58.5	0.012	29.3	0.006	14.6	0.006	102.4	0.016	87.8	0.010	58.5(	37.3)	0.010(	0.004)
GONIMACU	14.6	0.041	14.6	0.121	0.0	0.000	0.0	0.000	14.6	0.004	8.8(	8.0)	0.033(	0.052)
MAGEPAPI	43.9	0.089	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	19.6)	0.018(	0.040)
NEPHCAEC	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.660	0.0	0.000	2.9(	6.5)	0.132(	0.295)
NEPHCIRR	102.4	0.249	190.2	0.579	146.3	0.799	73.2	0.404	175.6	0.644	137.5(	49.2)	0.535(	0.214)
SCOLARMI	14.6	0.176	14.6	0.427	14.6	0.102	14.6	0.104	0.0	0.000	11.7(	6.5)	0.162(	0.161)
SCOLS"UA	0.0	0.000	14.6	0.186	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.037(	0.083)
SPIOBOMB	248.7	0.025	43.9	0.006	160.9	0.010	234.1	0.007	102.4	0.016	158.0(	86.8)	0.013(	0.008)
SPIOFILI	0.0	0.000	0.0	0.000	29.3	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.000(	0.000)
MISCELLANEOUS														
NEMERTIN	0.0	0.000	0.0	0.000	14.6	0.038	14.6	0.022	0.0	0.000	5.9(	8.0)	0.012(	0.017)
PHORONID	14.6	0.006	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
5	1082.6	1.061	555.9	17.885	585.2	1.159	585.2	1.317	512.0	0.847	664.2(	235.8)	4.454(	7.510)
NSPC	13		12		11		11		7					
SH-W	2.131		2.068		2.010		1.886		1.683					
SIMP	0.137		0.156		0.153		0.200		0.193					

Appendix - 2 Biomonitoring 1993

STATION : VD4
GEOGR. POS. : 51° 55" 23' N 03° 55" 15' E
DATE : 03/05/93
DEPTH m : 13
Median Grain: 192.94
Perc. Mud. : 2.37

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLFALC	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BATHGUIL	14.6	0.031	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.006(	0.014)
PSEULONG	58.5	0.029	117.0	0.059	14.6	0.007	43.9	0.022	29.3	0.015	52.7(	39.5)	0.026(	0.020)
UROTPOSE	248.7	0.099	234.1	0.069	58.5	0.026	43.9	0.018	87.8	0.023	134.6(	98.9)	0.047(	0.036)
ECHINODERMATA														
ECHICORD	14.6	5.638	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	5.9(	8.0)	1.128(	2.522)
MOLLUSCA														
ABRANITI	0.0	0.000	14.6	17.511	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	3.502(	7.831)
ENSIDIRE	14.6	6.655	73.2	29.472	190.2	48.125	14.6	6.333	73.2	22.903	73.2(	71.7)	22.698(	17.447)
MONTFERR	117.0	0.072	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	23.4(	52.3)	0.014(	0.032)
MYSEBIDE	321.9	0.056	58.5	0.010	0.0	0.000	248.7	0.037	29.3	0.010	131.7(	144.1)	0.023(	0.023)
NATIALDE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.932	0.0	0.000	2.9(	6.5)	0.186(	0.417)
SPISSUBT	14.6	0.015	0.0	0.000	716.9	17.241	117.0	3.039	0.0	0.000	169.7(	309.8)	4.059(	7.485)
TELLFABU	146.3	2.986	73.2	0.591	102.4	1.491	204.8	1.150	29.3	0.051	111.2(	67.5)	1.254(	1.113)
POLYCHAETA														
CAPICAPI	14.6	0.000	0.0	0.000	14.6	0.000	43.9	0.004	0.0	0.000	14.6(	17.9)	0.001(	0.002)
CHAESETO	14.6	0.012	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
LANICONC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.004	2.9(	6.5)	0.001(	0.002)
MAGEPAPI	0.0	0.000	43.9	0.041	43.9	0.053	117.0	0.127	29.3	0.016	46.8(	43.2)	0.047(	0.049)
NEPHCIRR	0.0	0.000	29.3	0.211	43.9	0.006	29.3	0.012	0.0	0.000	20.5(	19.6)	0.046(	0.092)
NEPHHOMB	204.8	3.546	102.4	5.087	102.4	2.505	87.8	2.214	73.2	3.241	114.1(	52.1)	3.318(	1.126)
NERELONG	0.0	0.000	14.6	0.316	0.0	0.000	14.6	1.865	14.6	0.079	8.8(	8.0)	0.452(	0.801)
SIGAMATH	14.6	0.000	29.3	0.072	14.6	0.089	14.6	0.067	0.0	0.000	14.6(	10.3)	0.046(	0.042)
SPIOBOMB	541.3	0.217	351.1	0.167	321.9	0.146	336.5	0.257	204.8	0.132	351.1(	121.1)	0.184(	0.052)
SPIOFILI	14.6	0.006	43.9	0.004	14.6	0.004	14.6	0.000	14.6	0.004	20.5(	13.1)	0.004(	0.002)
THARMARI	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MISCELLANEOUS														
ANTHOZOA	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.006	0.0	0.000	5.9(	13.1)	0.001(	0.003)
NEMERTIN	29.3	0.107	43.9	0.019	0.0	0.000	43.9	0.038	0.0	0.000	23.4(	22.2)	0.033(	0.044)
OLIGOCHA	0.0	0.000	0.0	0.000	14.6	0.000	29.3	0.000	0.0	0.000	8.8(	13.1)	0.000(	0.000)
5	1784.9	19.468	1243.6	53.635	1667.8	69.694	1463.0	16.121	599.8	26.479	1351.8(	468.2)	37.079(	23.450)
NSPC	16		15		14		19		11					
SH-W	2.072		2.264		1.829		2.419		2.022					
SIMP	0.163		0.135		0.239		0.114		0.159					

STATION : VD3
GEOGR. POS. : 42° 35" 49' N 04° 63" 80' E
DATE : 13/04/93
DEPTH m : 05
Median Grain: -
Perc. Mud. : -

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHELEG	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
BODOSCOR	14.6	0.007	14.6	0.007	0.0	0.000	0.0	0.000	14.6	0.007	8.8(	8.0)	0.004(	0.004)
CAPRELLI	29.3	0.015	29.3	0.015	0.0	0.000	0.0	0.000	14.6	0.007	14.6(	14.6)	0.007(	0.007)
DIASBRAD	0.0	0.000	0.0	0.000	14.6	0.022	0.0	0.000	0.0	0.000	2.9(	6.5)	0.004(	0.010)
UROTPOSE	0.0	0.000	73.2	0.056	0.0	0.000	0.0	0.000	87.8	0.056	32.2(	44.4)	0.022(	0.030)
ECHINODERMATA														
ECHICORD	0.0	0.000	43.9	30.648	0.0	0.000	0.0	0.000	102.4	43.346	29.3(	45.1)	14.799(	20.755)
OPHIALBI	43.9	0.161	87.8	5.325	58.5	2.253	29.3	1.106	0.0	0.000	43.9(	32.7)	1.769(	2.182)
MOLLUSCA														
ABRAALBA	0.0	0.000	0.0	0.000	29.3	0.006	14.6	0.053	0.0	0.000	8.8(	13.1)	0.012(	0.023)
ENSIDIRE	877.8	413.436	248.7	137.657	629.1	461.249	658.3	368.910	526.7	272.686	588.1(	228.9)	330.788(	128.433)
MACOBALT	0.0	0.000	14.6	0.310	29.3	0.456	0.0	0.000	14.6	0.338	11.7(	12.2)	0.221(	0.209)
MONTFERR	0.0	0.000	73.2	0.067	0.0	0.000	0.0	0.000	43.9	0.064	23.4(	33.7)	0.026(	0.036)
MYA_AREN	0.0	0.000	0.0	0.000	14.6	48.539	14.6	26.248	0.0	0.000	5.9(	8.0)	14.957(	21.945)
MYSEBIDE	58.5	0.010	146.3	0.026	58.5	0.018	87.8	0.013	131.7	0.064	96.6(	40.9)	0.026(	0.022)
SPISSUBT	0.0	0.000	0.0	0.000	14.6	0.016	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.007)
TELLFABU	14.6	0.000	58.5	0.250	43.9	0.004	14.6	0.044	87.8	0.559	43.9(	31.0)	0.171(	0.240)
TELLTENU	0.0	0.000	117.0	2.316	0.0	0.000	0.0	0.000	160.9	2.661	55.6(	77.7)	0.995(	1.368)
VENESENE	0.0	0.000	0.0	0.000	14.6	13.293	0.0	0.000	0.0	0.000	2.9(	6.5)	2.659(	5.945)
POLYCHAETA														
ANAIMACU	58.5	0.054	131.7	0.303	73.2	0.158	87.8	0.143	102.4	0.176	90.7(	28.1)	0.167(	0.089)
CAPICAPI	58.5	0.006	14.6	0.004	0.0	0.000	29.3	0.004	29.3	0.012	26.3(	21.7)	0.005(	0.004)
EUMISANG	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.023	5.9(	13.1)	0.005(	0.010)
HARMLUNU	29.3	0.006	73.2	1.061	0.0	0.000	43.9	0.018	0.0	0.000	29.3(	31.0)	0.217(	0.472)
HETEFILI	14.6	0.006	0.0	0.000	29.3	0.079	0.0	0.000	0.0	0.000	8.8(	13.1)	0.017(	0.035)
LANICONC	278.0	4.099	0.0	0.000	14.6	0.294	87.8	1.333	307.2	3.296	137.5(	145.8)	1.804(	1.820)
NEPHCIRR	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
NEPHHOMB	58.5	0.315	43.9	1.002	43.9	0.236	43.9	0.260	29.3	0.345	43.9(	10.3)	0.432(	0.322)
NERELONG	14.6	0.252	29.3	2.099	14.6	1.918	43.9	2.063	29.3	1.371	26.3(	12.2)	1.541(	0.777)
NOTOLATE	0.0	0.000	0.0	0.000	43.9	2.736	87.8	2.246	29.3	0.500	32.2(	36.4)	1.096(	1.301)
SCOLARMI	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.035	0.0	0.000	2.9(	6.5)	0.007(	0.016)
SPIOBOMB	278.0	0.113	219.4	0.301	175.6	0.108	58.5	0.031	658.3	0.894	278.0(	227.4)	0.289(	0.352)
SPIOFILI	14.6	0.000	43.9	0.013	14.6	0.004	29.3	0.025	0.0	0.000	20.5(	16.7)	0.008(	0.011)
THARMARI	278.0	0.060	0.0	0.000	219.4	0.037	234.1	0.022	0.0	0.000	146.3(	135.3)	0.024(	0.026)
MISCELLANEOUS														
NEMERTIN	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.003	2.9(	6.5)	0.001(	0.001)
OLIGOCHA	248.7	0.012	0.0	0.000	29.3	0.004	29.3	0.006	14.6	0.000	64.4(	103.8)	0.004(	0.005)
5	2370.1	418.551	1477.6	181.469	1565.4	531.430	1609.3	402.559	2443.2	326.408	1893.1(	471.9)	372.084(	129.325)
NSPC	17		19		20		18		21					
SH-W	2.063		2.622		2.180		2.158		2.307					
SIMP	0.188		0.082		0.196		0.198		0.144					

STATION : VD2
GEOGR. POS. : 41° 45" 36' N 03° 13" 15' E
DATE : 13/04/93
DEPTH m : 04
Median Grain: -
Perc. Mud. : -

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHGUIL	0.0	0.000	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.007)
PONTALTA	0.0	0.000	58.5	0.012	14.6	0.007	14.6	0.007	29.3	0.015	23.4(	22.2)	0.008(	0.006)
UROTBREV	43.9	0.044	58.5	0.060	102.4	0.078	14.6	0.016	73.2	0.041	58.5(	32.7)	0.048(	0.023)
UROTPOSE	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
MOLLUSCA														
MYSEBIDE	29.3	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.002)
POLYCHAETA														
NEPHCIRR	14.6	0.031	14.6	0.104	14.6	0.010	29.3	0.031	29.3	0.430	20.5(	8.0)	0.121(	0.176)
PARAFULG	0.0	0.000	0.0	0.000	14.6	0.004	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
SCOLBONN	14.6	0.007	14.6	0.022	14.6	0.004	0.0	0.000	58.5	0.029	20.5(	22.2)	0.013(	0.012)
MISCELLANEOUS														
NEMERTIN	14.6	0.059	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.012(	0.026)
5	131.7	0.149	146.3	0.198	190.2	0.119	58.5	0.054	190.2	0.515	143.4(	54.2)	0.207(	0.180)
NSPC	6		4		6		3		4					
SH-W	1.677		1.194		1.411		1.040		1.306					
SIMP	0.111		0.267		0.282		0.167		0.231					

STATION : VD1
GEOGR. POS. : 51° 37" 01' N 03° 23" 25' E
DATE : 03/05/93
DEPTH m : 11
Median Grain: 252.06
Perc. Mud. : 1.05

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
BATHELEG	0.0	0.000	29.3	0.016	29.3	0.004	14.6	0.007	0.0	0.000	14.6(	14.6)	0.006(	0.007)
BATHGUIL	0.0	0.000	0.0	0.000	14.6	0.022	0.0	0.000	0.0	0.000	2.9(	6.5)	0.004(	0.010)
PSEULONG	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	2.9(	6.5)	0.001(	0.003)
UROTBREV	0.0	0.000	0.0	0.000	14.6	0.012	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
UROTPOSE	395.0	0.148	204.8	0.034	643.7	0.215	321.9	0.129	219.4	0.064	357.0(	178.2)	0.118(	0.071)
ECHINODERMATA														
ECHICORD	29.3	33.043	14.6	3.009	14.6	4.737	14.6	7.357	14.6	9.591	17.6(	6.5)	11.548(	12.275)
MOLLUSCA														
ENSIDIRE	14.6	4.224	29.3	9.014	14.6	5.913	14.6	8.092	14.6	6.480	17.6(	6.5)	6.744(	1.876)
MONTFERR	87.8	0.045	14.6	0.004	29.3	0.009	0.0	0.000	43.9	0.016	35.1(	33.7)	0.015(	0.018)
MYSEBIDE	248.7	0.075	0.0	0.000	190.2	0.053	219.4	0.028	29.3	0.003	137.5(	114.5)	0.032(	0.032)
SPISSUBT	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.715	0.0	0.000	2.9(	6.5)	0.143(	0.320)
TELLFABU	0.0	0.000	0.0	0.000	29.3	0.018	0.0	0.000	0.0	0.000	5.9(	13.1)	0.004(	0.008)
TELLTENU	0.0	0.000	14.6	0.702	0.0	0.000	14.6	0.935	0.0	0.000	5.9(	8.0)	0.327(	0.456)
POLYCHAETA														
LANICONC	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.767	0.0	0.000	5.9(	13.1)	0.153(	0.343)
MAGEPAPI	0.0	0.000	29.3	0.037	43.9	0.037	0.0	0.000	0.0	0.000	14.6(	20.7)	0.015(	0.020)
NEPHCIRR	117.0	1.460	87.8	0.844	102.4	0.344	204.8	1.151	117.0	1.106	125.8(	45.8)	0.981(	0.418)
NEPHHOMB	0.0	0.000	14.6	0.078	0.0	0.000	0.0	0.000	14.6	0.170	5.9(	8.0)	0.049(	0.075)
NERELONG	0.0	0.000	0.0	0.000	14.6	0.827	0.0	0.000	0.0	0.000	2.9(	6.5)	0.165(	0.370)
NOTOLATE	0.0	0.000	14.6	0.209	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.042(	0.094)
SCOLARMI	29.3	0.022	0.0	0.000	29.3	0.029	14.6	0.018	14.6	0.004	17.6(	12.2)	0.015(	0.012)
SCOLBONN	190.2	0.657	29.3	0.132	58.5	0.199	43.9	0.138	73.2	0.217	79.0(	64.3)	0.268(	0.220)
SPIOBOMB	395.0	0.344	146.3	0.079	292.6	0.296	453.5	0.587	219.4	0.338	301.4(	125.3)	0.329(	0.180)
MISCELLANEOUS														
NEMERTIN	160.9	1.384	14.6	0.003	29.3	0.006	73.2	0.048	43.9	0.110	64.4(	58.2)	0.310(	0.602)
OLIGOCHA	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
5	1682.4	41.406	643.7	14.160	1550.8	12.719	1448.4	19.979	804.7	18.099	1226.0(	469.0)	21.273(	11.628)
NSPC	11		13		16		14		11					
SH-W	1.997		2.051		1.936		1.921		1.936					
SIMP	0.155		0.164		0.224		0.187		0.172					

STATION : W30
GEOGR. POS. : 51° 43" 03' N 03° 06" 66' E
DATE : 04/05/93
DEPTH m : 27
Median Grain: 348.21
Perc. Mud. : 0.82

	BOX 1 N	BOX 1 B	BOX 2 N	BOX 2 B	BOX 3 N	BOX 3 B	BOX 4 N	BOX 4 B	BOX 5 N	BOX 5 B	MEAN N	S.D.	MEAN B	S.D.
CRUSTACEA														
BATHGUIL	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.044	2.9(	6.5)	0.009(	0.020)
MEGAAGIL	14.6	0.007	14.6	0.007	14.6	0.007	14.6	0.007	14.6	0.007	14.6(	0.0)	0.007(	0.000)
PERILONG	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
PONTALTA	0.0	0.000	0.0	0.000	43.9	0.016	0.0	0.000	0.0	0.000	8.8(	19.6)	0.003(	0.007)
PSEULONG	29.3	0.015	0.0	0.000	14.6	0.007	14.6	0.007	0.0	0.000	11.7(	12.2)	0.006(	0.006)
PSEUSIMI	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.015	14.6	0.007	8.8(	13.1)	0.004(	0.007)
UROTBREV	29.3	0.056	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.012(	0.024)
ECHINODERMATA														
ECHICORD	29.3	11.125	14.6	12.510	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	4.727(	6.491)
ECHIPUSI	14.6	0.000	14.6	0.000	14.6	0.000	43.9	0.015	0.0	0.000	17.6(	16.0)	0.003(	0.007)
OPHIALBI	0.0	0.000	14.6	0.761	0.0	0.000	14.6	0.000	0.0	0.000	5.9(	8.0)	0.152(	0.340)
MOLLUSCA														
MACTCORA	14.6	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	5.9(	8.0)	0.000(	0.000)
NATIALDE	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.016	0.0	0.000	2.9(	6.5)	0.003(	0.007)
SPISELLI	0.0	0.000	43.9	1.059	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	19.6)	0.212(	0.474)
TELLPYGM	58.5	0.032	29.3	0.051	0.0	0.000	0.0	0.000	0.0	0.000	17.6(	26.2)	0.017(	0.024)
POLYCHAETA														
ANAIMACU	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
ARICMINU	14.6	0.000	14.6	0.000	73.2	0.006	0.0	0.000	43.9	0.018	29.3(	29.3)	0.005(	0.008)
ETEOLONG	0.0	0.000	14.6	0.016	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.003(	0.007)
EXOGNAID	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
GLYCLAPI	58.5	0.219	14.6	0.004	0.0	0.000	117.0	0.361	29.3	0.209	43.9(	46.3)	0.159(	0.155)
HESIAUGE	14.6	0.000	87.8	0.000	0.0	0.000	0.0	0.000	0.0	0.000	20.5(	38.2)	0.000(	0.000)
MAGEPAPI	0.0	0.000	0.0	0.000	29.3	0.097	14.6	0.108	14.6	0.080	11.7(	12.2)	0.057(	0.053)
NEPHCIRR	117.0	1.921	292.6	13.672	117.0	1.151	131.7	0.900	146.3	0.859	160.9(	74.6)	3.701(	5.590)
OPHELIMA	14.6	0.288	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.058(	0.129)
SCOLARMI	58.5	0.623	0.0	0.000	0.0	0.000	14.6	0.007	0.0	0.000	14.6(	25.3)	0.126(	0.278)
SCOLBONN	0.0	0.000	14.6	0.097	29.3	0.274	0.0	0.000	29.3	0.467	14.6(	14.6)	0.167(	0.201)
SCOLS°UA	0.0	0.000	0.0	0.000	0.0	0.000	73.2	0.351	0.0	0.000	14.6(	32.7)	0.070(	0.157)
SPIOBOMB	278.0	0.464	819.3	0.483	102.4	0.012	453.5	0.108	746.1	0.524	479.9(	304.1)	0.318(	0.239)
SPIOFILI	0.0	0.000	146.3	0.006	29.3	0.013	87.8	0.019	204.8	0.072	93.6(	83.8)	0.022(	0.029)
TRAVFORB	0.0	0.000	14.6	0.004	14.6	0.288	43.9	0.925	14.6	0.360	17.6(	16.0)	0.315(	0.378)
MISCELLANEOUS														
ANTHOZOA	0.0	0.000	14.6	0.003	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.001)
NEMERTIN	43.9	0.006	58.5	0.019	58.5	0.006	29.3	0.006	0.0	0.000	38.0(	24.5)	0.007(	0.007)
5	804.7	14.763	1667.8	28.704	555.9	1.877	1097.3	2.846	1272.8	2.647	1079.7(	428.2)	10.167(	11.658)
NSPC	[illegible]		20		13		15		11					
SH-W	2.250		1.847		2.287		2.037		1.402					
SIMP	0.15[illegible]		0.279		0.101		0.203		0.379					

Appendix - 2 Biomonitoring 1993

STATION : W70
GEOGR. POS. : 51° 57" 45' N 02° 40" 75' E
DATE : 04/05/93
DEPTH m : 44
Median Grain: 476.37
Perc. Mud. : 0.85

	BOX 1		BOX 2		BOX 3		BOX 4		BOX 5		MEAN	S.D.	MEAN	S.D.
	N	B	N	B	N	B	N	B	N	B	N		B	
CRUSTACEA														
ATYLFALC	0.0	0.000	14.6	0.007	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.003)
ATYLSWAM	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.015	29.3	0.015	11.7(	16.0)	0.006(	0.008)
BATHGUIL	14.6	0.007	14.6	0.023	0.0	0.000	0.0	0.000	14.6	0.007	8.8(	8.0)	0.008(	0.010)
MEGAAGIL	73.2	0.037	14.6	0.007	14.6	0.007	14.6	0.007	102.4	0.051	43.9(	41.4)	0.022(	0.021)
MENIOBTU	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.007)
PSEULONG	0.0	0.000	0.0	0.000	0.0	0.000	29.3	0.015	0.0	0.000	5.9(	13.1)	0.003(	0.007)
PSEUSIMI	43.9	0.022	14.6	0.007	0.0	0.000	14.6	0.007	43.9	0.022	23.4(	19.6)	0.012(	0.010)
UNCIPLAN	0.0	0.000	29.3	0.015	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.003(	0.007)
ECHINODERMATA														
ACROBRAC	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	58.5	0.003	11.7(	26.2)	0.001(	0.001)
ECHIPUSI	73.2	0.044	102.4	0.698	0.0	0.000	58.5	0.003	190.2	0.012	84.9(	69.7)	0.151(	0.306)
OPHIALBI	14.6	0.000	87.8	0.015	14.6	0.010	14.6	0.000	29.3	0.020	32.2(	31.7)	0.009(	0.009)
MOLLUSCA														
ABRANITI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
MACTCORA	43.9	0.003	43.9	0.000	102.4	0.006	190.2	0.010	131.7	0.006	102.4(	62.1)	0.005(	0.004)
MYSEBIDE	14.6	0.000	29.3	0.023	0.0	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.005(	0.010)
NATIALDE	117.0	0.026	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	23.4(	52.3)	0.005(	0.012)
TELLPYGM	160.9	0.164	263.3	0.082	58.5	0.022	14.6	0.000	175.6	0.051	134.6(	98.9)	0.064(	0.064)
TELLSPEC	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
POLYCHAETA														
ANAIMACU	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.007	2.9(	6.5)	0.001(	0.003)
ARICMINU	117.0	0.010	58.5	0.004	0.0	0.000	14.6	0.000	0.0	0.000	38.0(	50.3)	0.003(	0.005)
ETEOLONG	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
EUNICIDA	0.0	0.000	14.6	0.012	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.002(	0.005)
EXOGHEBE	43.9	0.000	0.0	0.000	14.6	0.000	14.6	0.000	0.0	0.000	14.6(	17.9)	0.000(	0.000)
EXOGNAID	0.0	0.000	29.3	0.000	0.0	0.000	0.0	0.000	102.4	0.006	26.3(	44.4)	0.001(	0.003)
GLYCLAPI	29.3	0.006	43.9	0.042	14.6	0.047	73.2	0.041	29.3	0.007	38.0(	22.2)	0.029(	0.020)
HESIAUGE	14.6	0.000	87.8	0.004	58.5	0.004	73.2	0.004	87.8	0.006	64.4(	30.3)	0.004(	0.002)
MAGEPAPI	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	2.9(	6.5)	0.000(	0.000)
MALDANID	0.0	0.000	14.6	0.053	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.011(	0.024)
NEPHCIRR	73.2	0.439	58.5	0.493	43.9	0.209	29.3	0.199	117.0	0.543	64.4(	33.7)	0.377(	0.162)
OPHELIMA	14.6	0.013	14.6	0.019	0.0	0.000	29.3	0.042	14.6	0.010	14.6(	10.3)	0.017(	0.016)
OPISPTER	29.3	0.000	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	8.8(	13.1)	0.000(	0.000)
POECSERP	14.6	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.001(	0.002)
PRIOCIRR	0.0	0.000	0.0	0.000	0.0	0.000	14.6	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
SCOLARMI	29.3	0.004	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	5.9(	13.1)	0.001(	0.002)
SCOLBONN	14.6	0.025	0.0	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.005(	0.011)
SCOLS°UA	0.0	0.000	0.0	0.000	14.6	0.452	0.0	0.000	14.6	0.168	5.9(	8.0)	0.124(	0.197)
SPHAHYST	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	73.2	0.006	17.6(	31.7)	0.001(	0.003)
SPIOBOMB	58.5	0.023	102.4	0.187	43.9	0.004	0.0	0.000	0.0	0.000	41.0(	43.2)	0.043(	0.081)
SPIOFILI	43.9	0.007	0.0	0.000	43.9	0.004	0.0	0.000	73.2	0.007	32.2(	31.7)	0.004(	0.004)
STREWEBS	29.3	0.000	0.0	0.000	43.9	0.004	14.6	0.000	73.2	0.007	32.2(	28.1)	0.002(	0.003)
TYPOLANG	0.0	0.000	14.6	0.000	0.0	0.000	0.0	0.000	0.0	0.000	2.9(	6.5)	0.000(	0.000)
MISCELLANEOUS														
BRANLANC	0.0	0.000	0.0	0.000	29.3	0.509	0.0	0.000	0.0	0.000	5.9(	13.1)	0.102(	0.228)
NEMERTIN	160.9	0.097	102.4	0.689	131.7	0.123	117.0	0.402	131.7	0.119	128.7(	21.7)	0.286(	0.258)
OLIGOCHA	0.0	0.000	43.9	0.000	0.0	0.000	14.6	0.000	0.0	0.000	11.7(	19.1)	0.000(	0.000)
5	1258.2	0.932	1243.6	2.396	643.7	1.403	760.8	0.746	1536.2	1.074	1088.5(	373.7)	1.310(	0.653)
NSPC	25		24		15		18		22					
SH-W	2.891		2.785		2.442		2.467		2.802					
SIMP	0.060		0.076		0.087		0.103		0.063					

CONTENTS