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**Nederlands Instituut voor Onderzoek der Zee**

Monitoring Macrofauna Dutch Sector of the North Sea

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ISSN 0923 - 3210

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

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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



## 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 potentiële 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 dichtbij 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 dichtheidsfluctuaties 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 Crustaceen 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



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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 gemeenschapskenmerken 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 ontwikkeling 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 reele 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



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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 beïnvloeden, 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 factoren 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 neerwaartse trends op META2 en N70 lokale vervuiling door b.v. olie-

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of 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<sub>2</sub>-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<sup>2</sup> 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.



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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:

$$\log_{10}(P) = a + c_1 \times \log_{10}(\bar{B}) + c_2 \times \log_{10}(\bar{W})$$

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  $< 63\mu\text{m}$ ) 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 aberrant 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.



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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. 3a-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. 4a-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 & Rohlf, 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. 5a-r. Significant trends have been marked by < and > symbols in Table 4 while their geographic distribution is shown in Figs. 6a-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. 7a-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<sub>2</sub> deficiencies in the bottom water. Low O<sub>2</sub>-saturation has immediate and dramatic consequences 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 descriptors 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



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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. 3a-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. 3a-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 deterioration of the benthic community due to pollution, O<sub>2</sub>-deficiency or disturbance generally leads to a reduction of the species number often accompanied by a decrease in total abundance (e.g. Rachor,



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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. 5a-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 5a-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 filiformis* 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 significant 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



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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.

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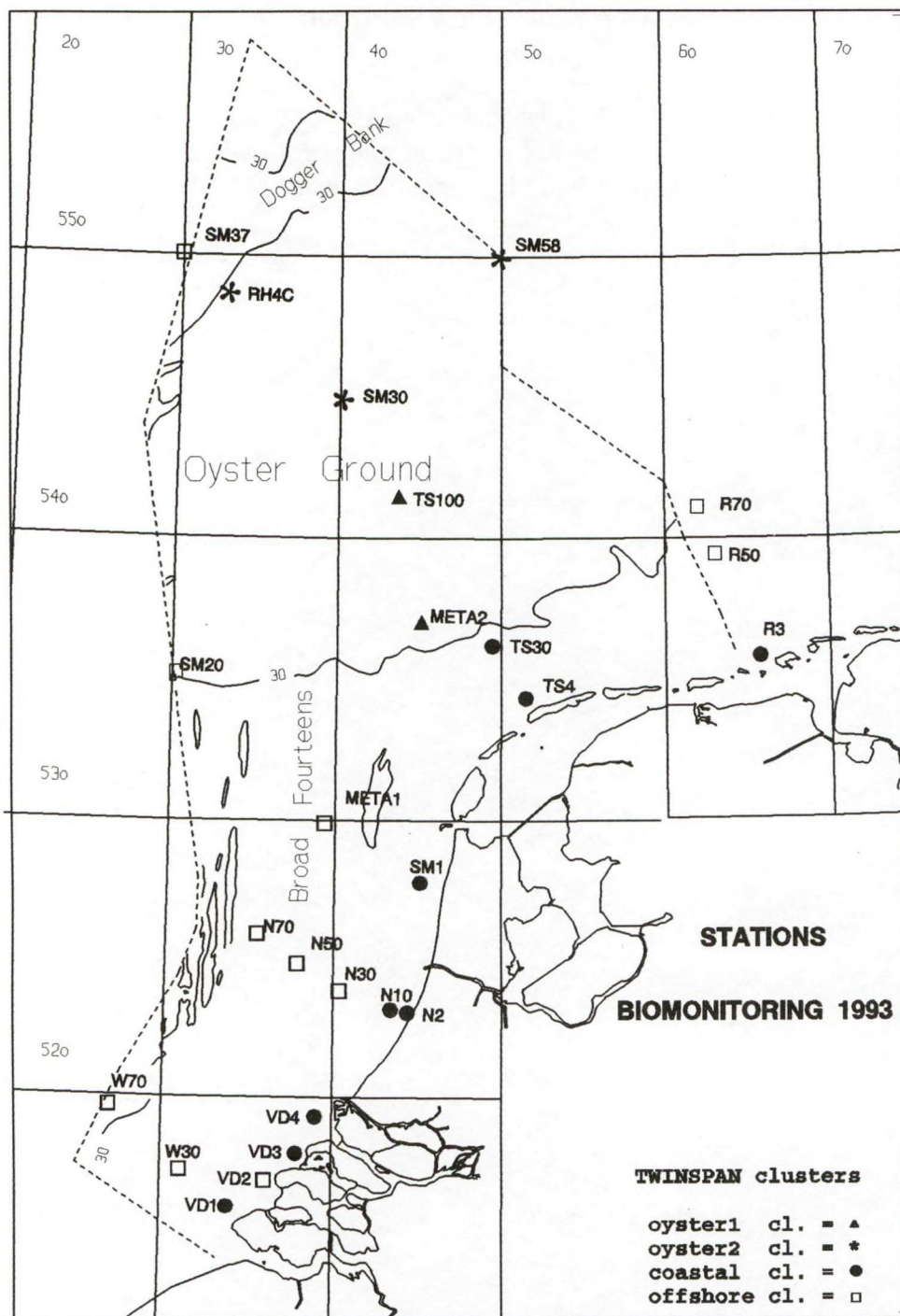


Fig. 1. Locations of the sampling stations which have been visited during the survey's in 1991, 1992 and 1993. The stations TS4, TS100, N2, N10 and N50 were previously sampled in 1990. The stations SM1, SM20, SM30, SM37, SM58 and RHC4 have been previously sampled during the ICES-NSBS in 1986. The various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



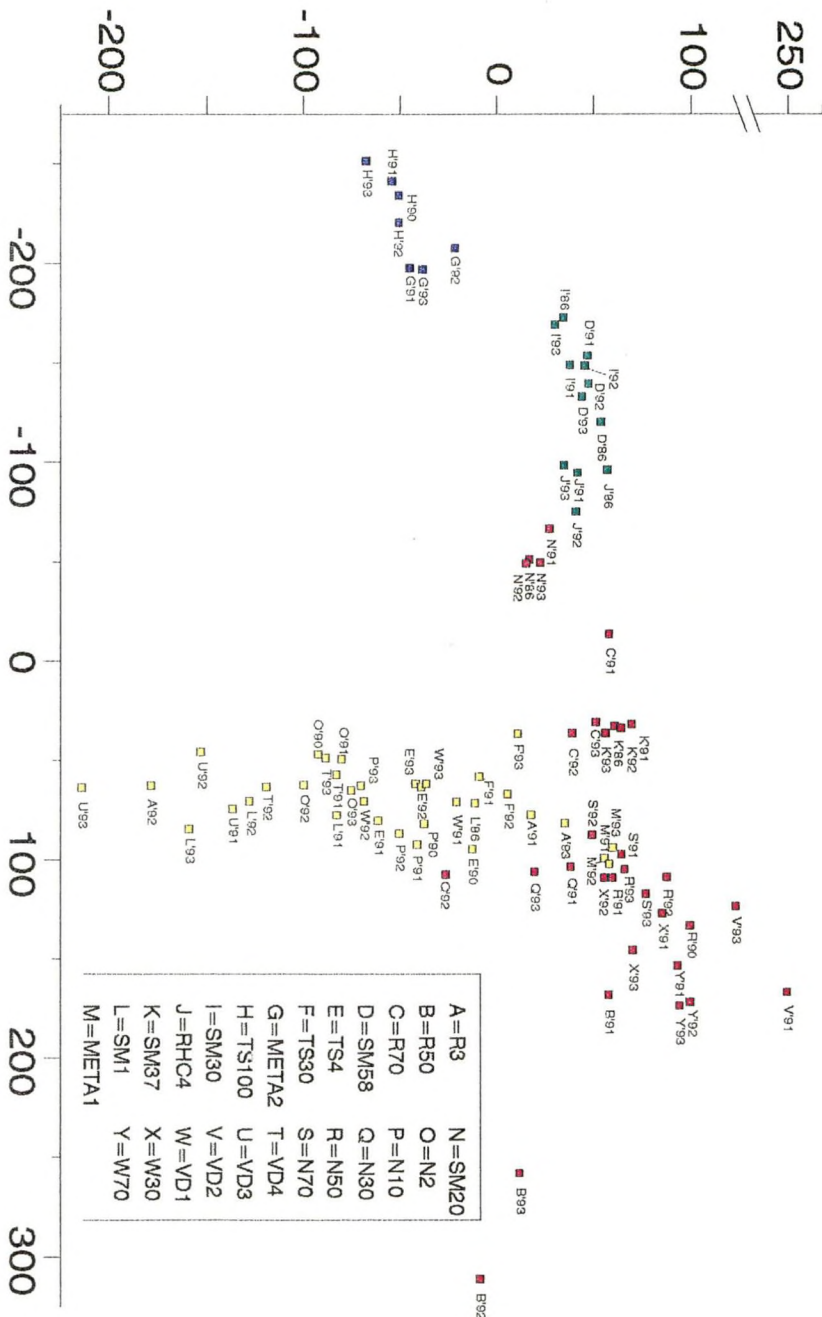


Fig.2. DECORANA ordination of the combined datasets from: -1- monitoring project (1991 - 1993; 25 stations), -2- 1990 monitoring survey(stations TS4, TS100, N2, N10, N50) and -3- ICES-NSBS (1986; stations SM1, SM20, SM30, SM37, SM58 and RHC4). Stationnames have been replaced by lettercodes (see inset)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



Table 1. Median grainsize (MED.; in  $\mu\text{m.}$ ) and percentage mud (MUD; particles  $< 63 \mu\text{m.}$ ) 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. ( $\mu\text{m.}$ ) |      |      | % MUD |      |      | CLUS-<br>TERS |          |
|---------|-------------------------|------|------|-------|------|------|---------------|----------|
|         | 1991                    | 1992 | 1993 | 1991  | 1992 | 1993 |               |          |
| META    | 105                     | 105  | 100  | 21.3  | 19.7 | 20.6 | 1             | OYSTER   |
| TS100   | 93                      | 94   | 92   | 17.0  | 14.4 | 16.6 |               |          |
| SM30    | 112                     | 113  | 107  | 7.9   | 9.3  | 10.9 |               |          |
| RHC4    | 142                     | 147  | 143  | 6.0   | 6.2  | 5.7  |               |          |
| SM58    | 148                     | 151  | 147  | 7.3   | 7.2  | 6.9  |               |          |
| R3      | 161                     | 144  | 163  | 3.0   | 10.4 | 2.3  | 2             | COASTAL  |
| TS4     | 210                     | 215  | 214  | 0.5   | 1.1  | 1.5  |               |          |
| TS30    | 215                     | 215  | 213  | 0.4   | 2.1  | 0.7  |               |          |
| SM1     | 226                     | 226  | 225  | 1.9   | 2.5  | 0.7  |               |          |
| N2      | 218                     | 252  | 240  | 5.0   | 3.9  | 3.4  |               |          |
| N10     | 327                     | 326  | 301  | 1.0   | 2.0  | 2.2  |               |          |
| VD4     | 202                     | 205  | 193  | 2.6   | 3.3  | 2.4  |               |          |
| VD3     | -                       | 256  | -    | -     | 1.9  | -    |               |          |
| VD1     | 255                     | 264  | 252  | 0.5   | 1.7  | 1.1  |               |          |
| R50     | 357                     | 316  | 352  | 0.5   | 2.6  | 0.9  |               | OFFSHORE |
| R70     | 215                     | -    | 216  | 2.2   | -    | 3.0  |               |          |
| META1   | 249                     | 246  | 251  | 0.6   | 1.8  | 0.6  |               |          |
| SM20    | 138                     | 134  | 134  | 10.5  | 9.0  | 7.5  |               |          |
| N30     | 334                     | 320  | 320  | 0.9   | 1.6  | 0.7  |               |          |
| N50     | 277                     | -    | 280  | 0.4   | -    | 0.9  |               |          |
| N70     | 282                     | 293  | 285  | 0.5   | 1.1  | 0.0  |               |          |
| VD2     | -                       | 265  | -    | -     | 1.7  | -    |               |          |
| W30     | 328                     | 308  | 348  | 0.4   | 2.7  | 0.8  |               |          |
| W70     | 392                     | 411  | 476  | 0.4   | 2.5  | 0.8  |               |          |
| SM37    | 188                     | 193  | 192  | 1.8   | 2.5  | 1.2  |               |          |



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



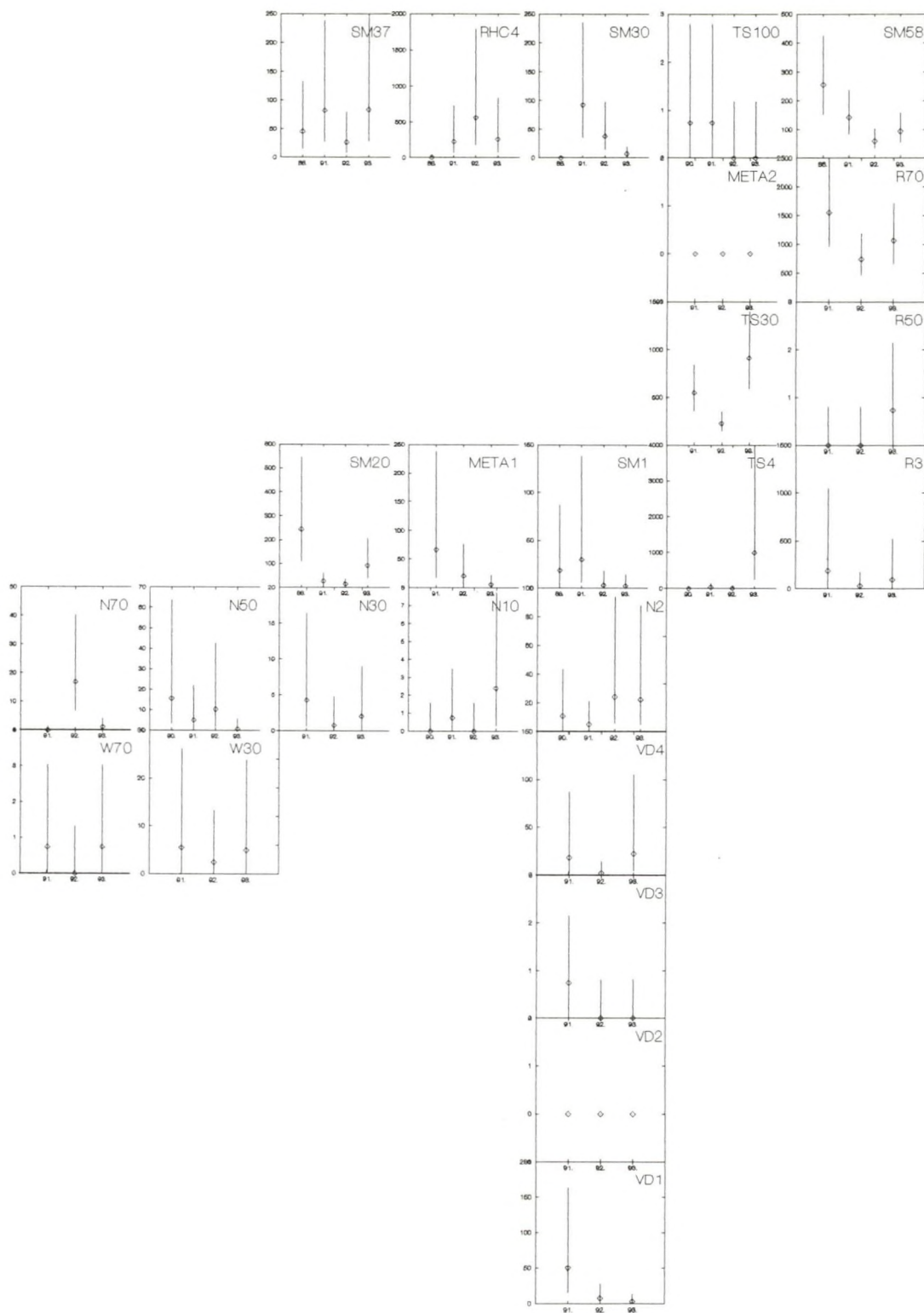


Fig. 3a. Comparison plots of *Magelona papillicornis* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means(See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



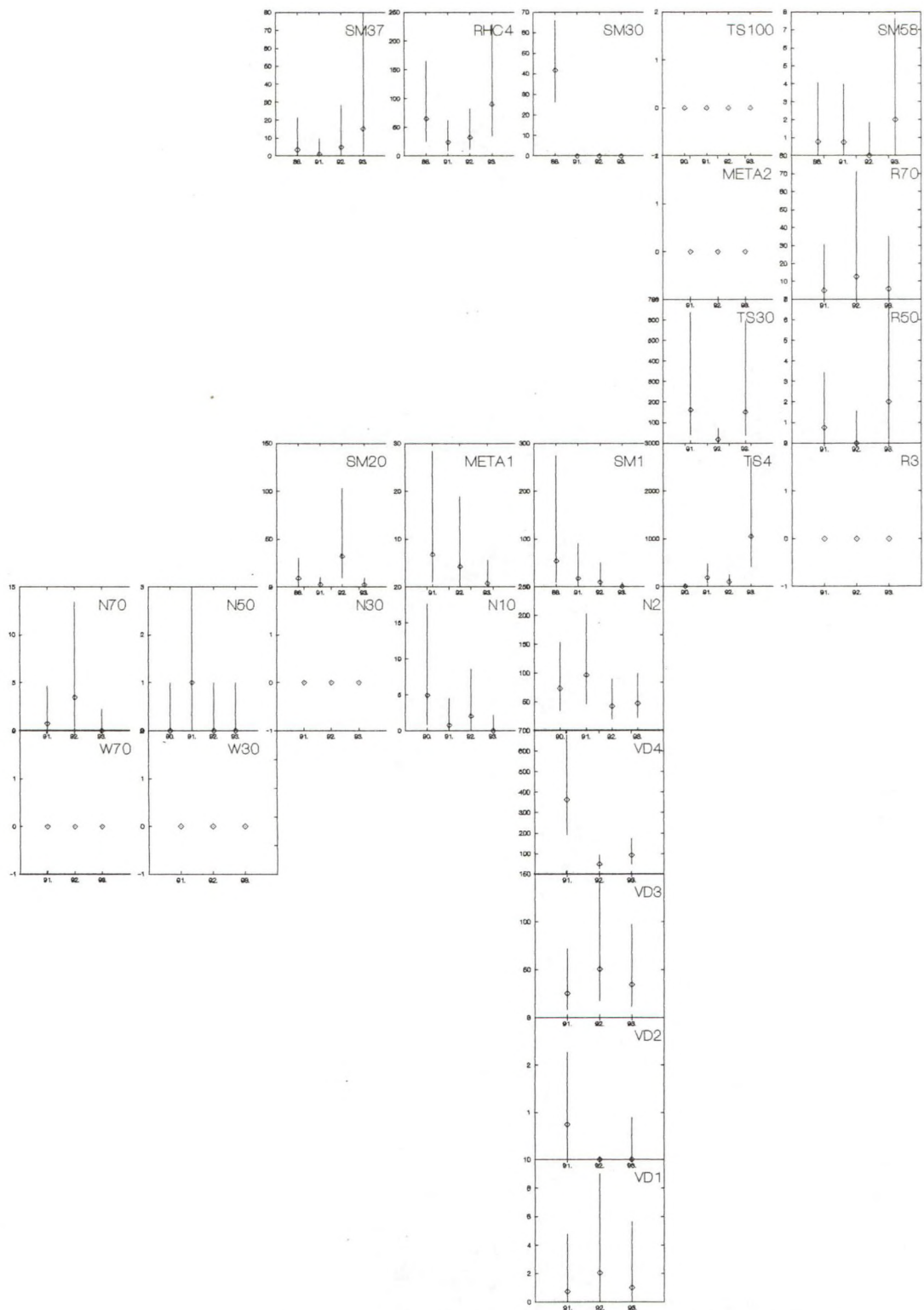


Fig. 3b. Comparison plots of *Tellina fabula* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



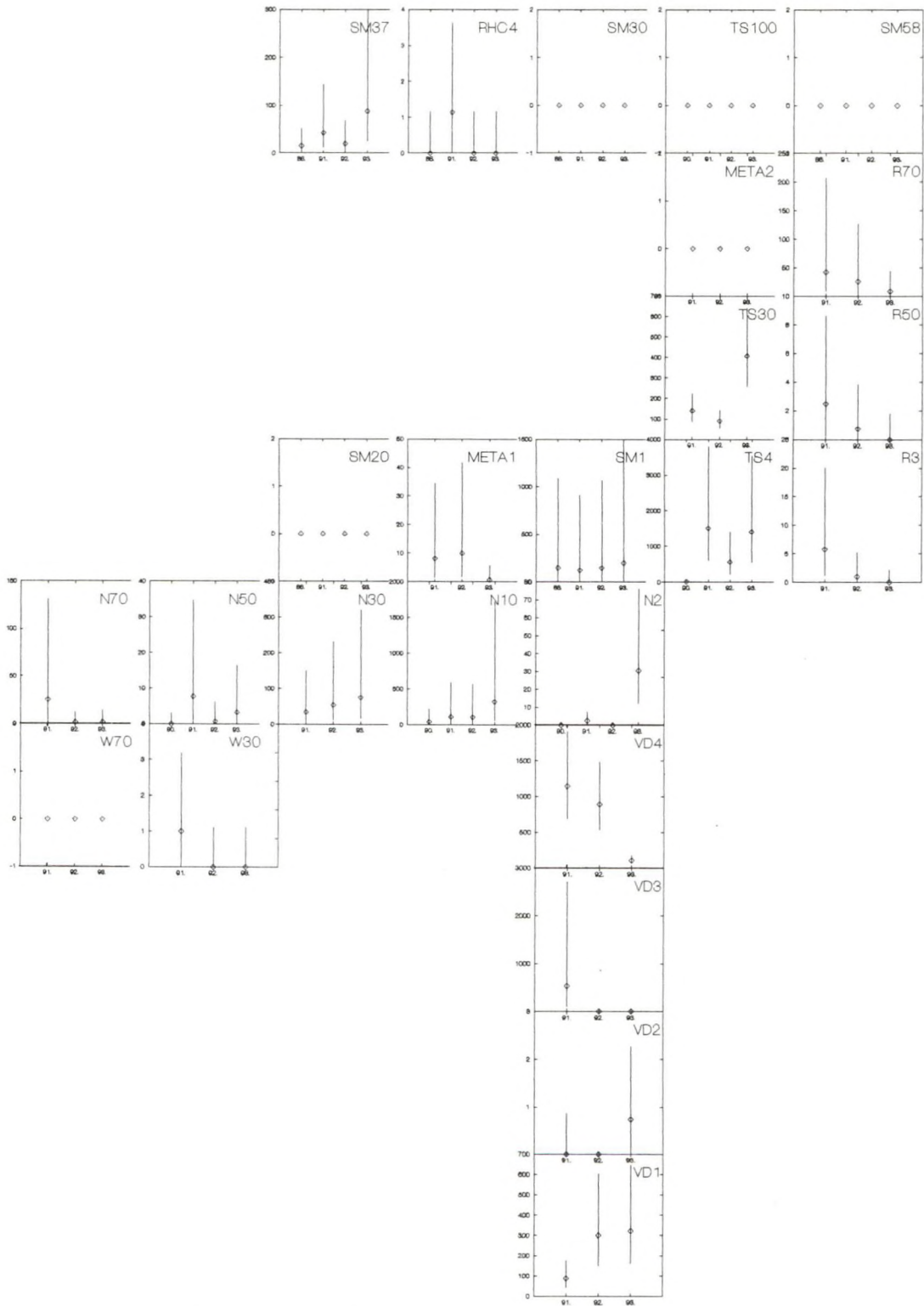


Fig. 3c. Comparison plots of *Urothoe poseidonis* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



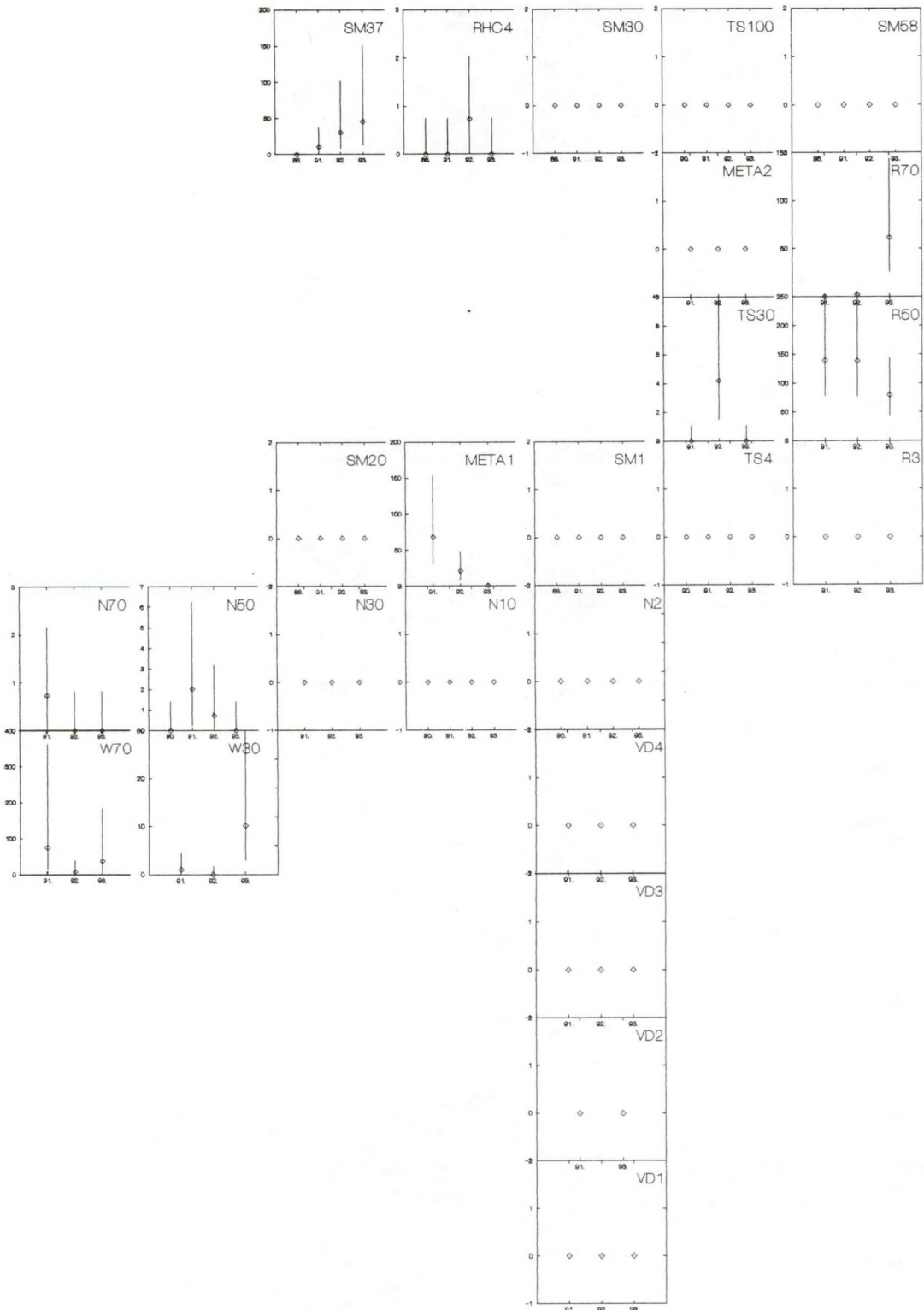


Fig. 3d. Comparison plots of *Echicyamus pusillus* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

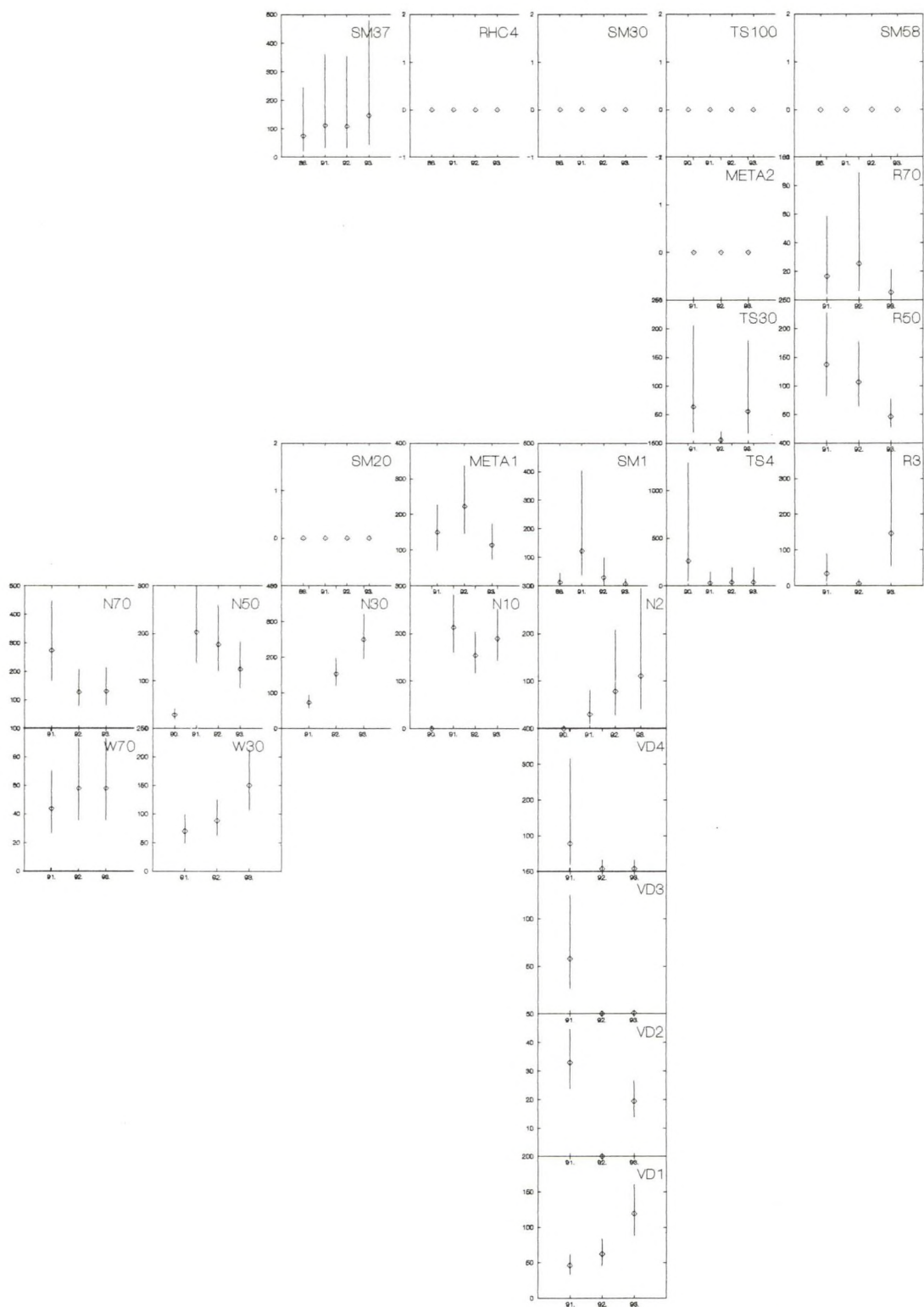


Fig. 3e. Comparison plots of *Neptys cirrosa* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



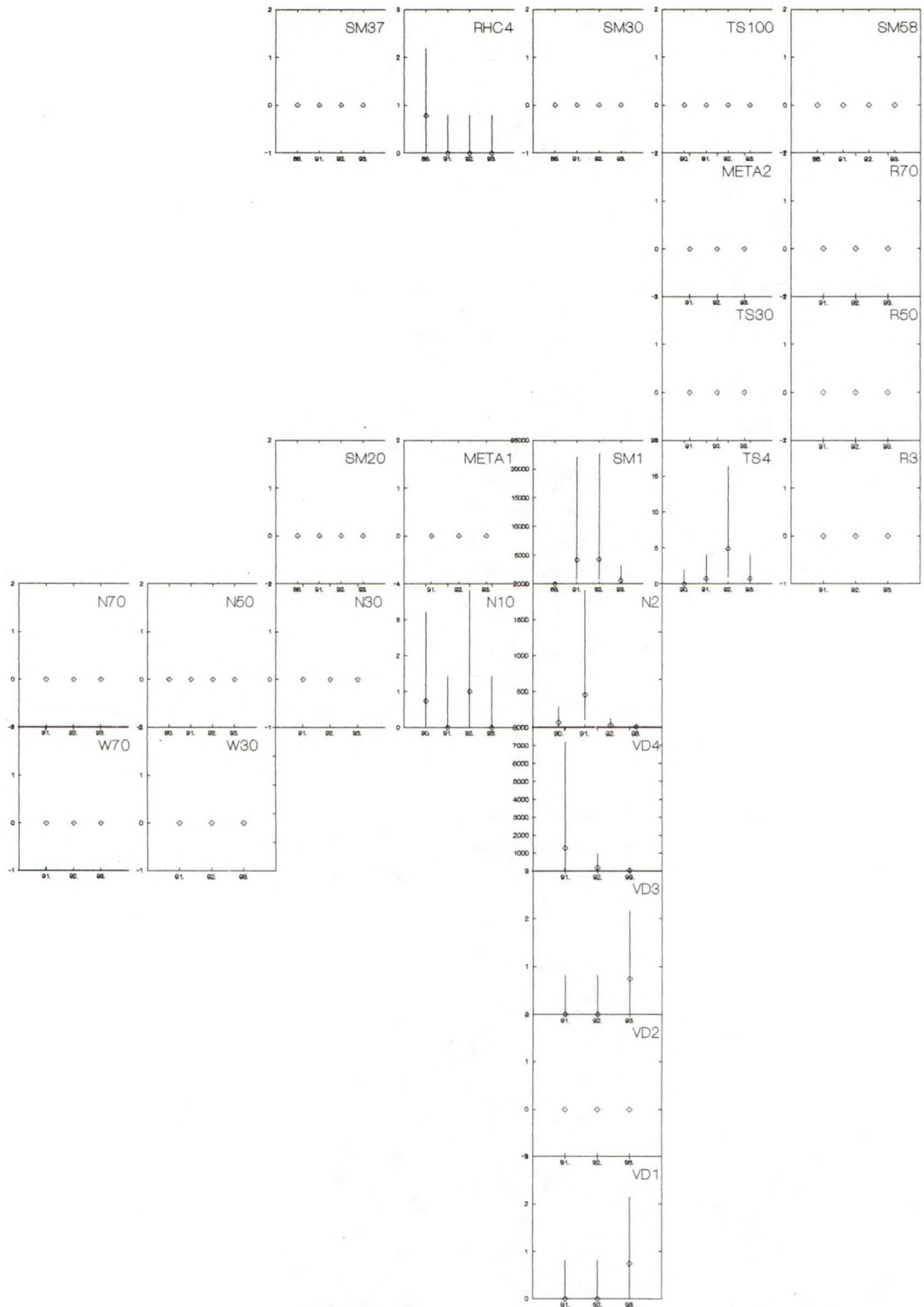


Fig. 3f. Comparison plots of *Spisula subtruncata* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

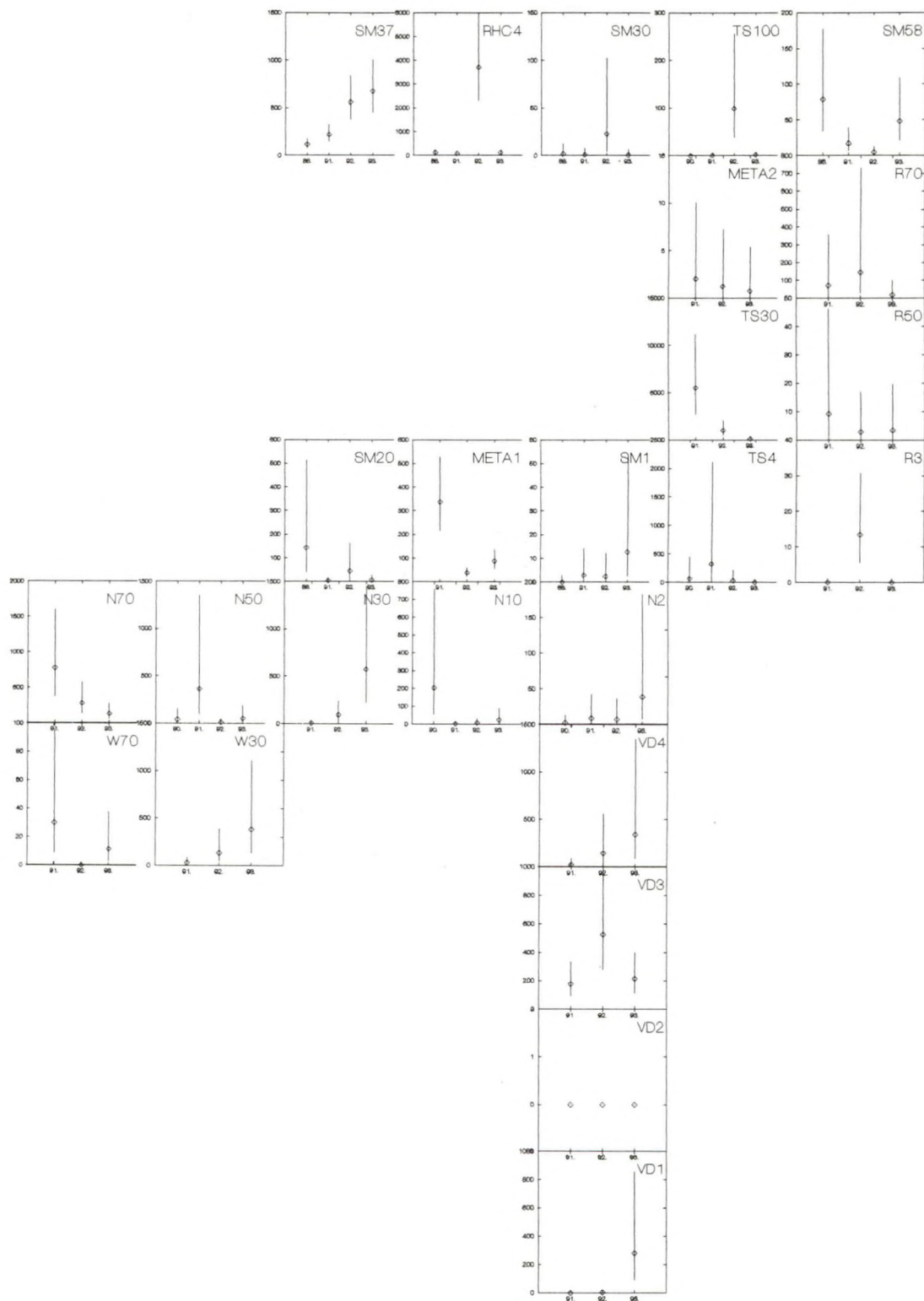


Fig. 3g. Comparison plots of *Spiophanes bombyx* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



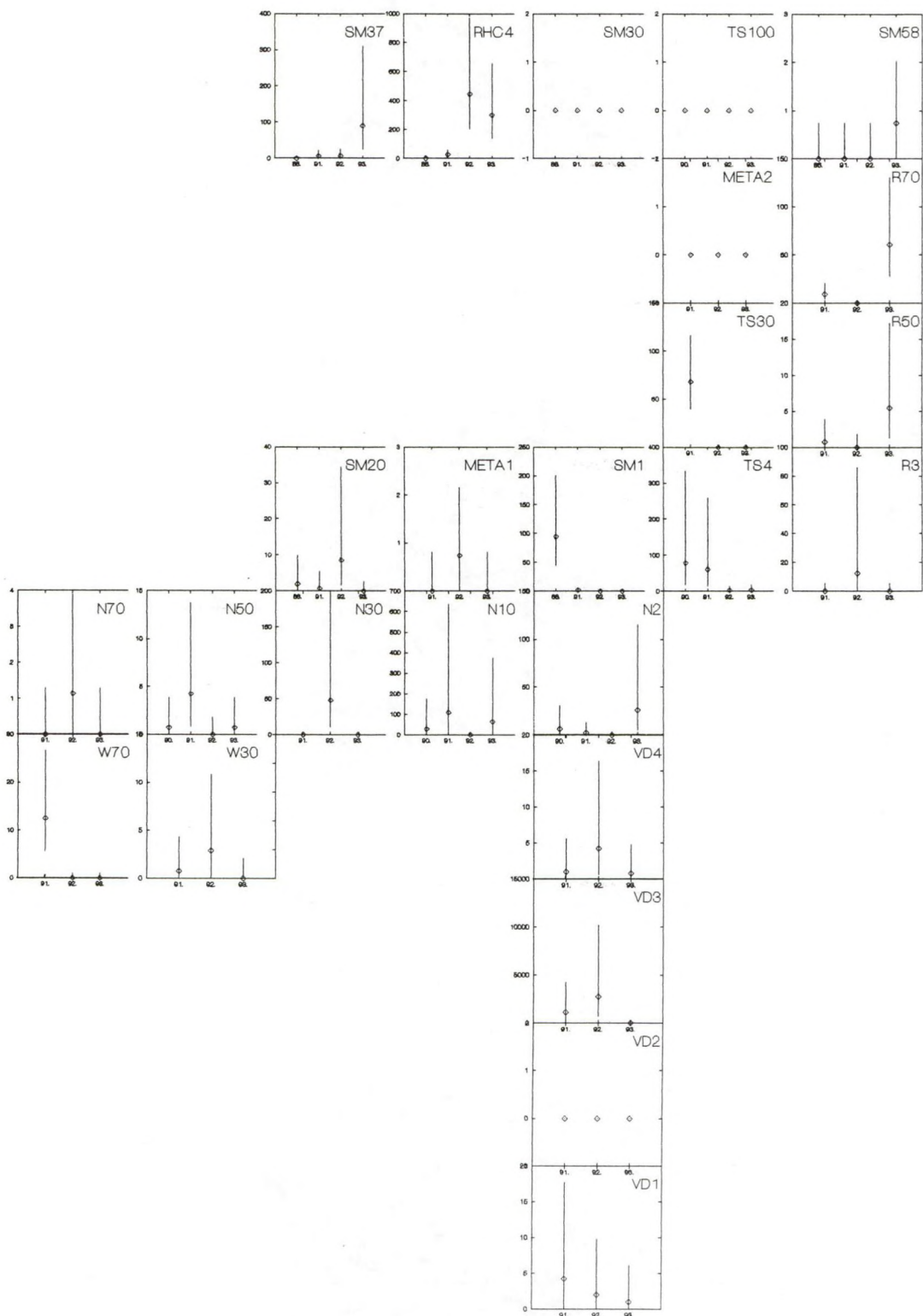


Fig. 3h. Comparison plots of *Lanice conchilega* (ind/m²), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

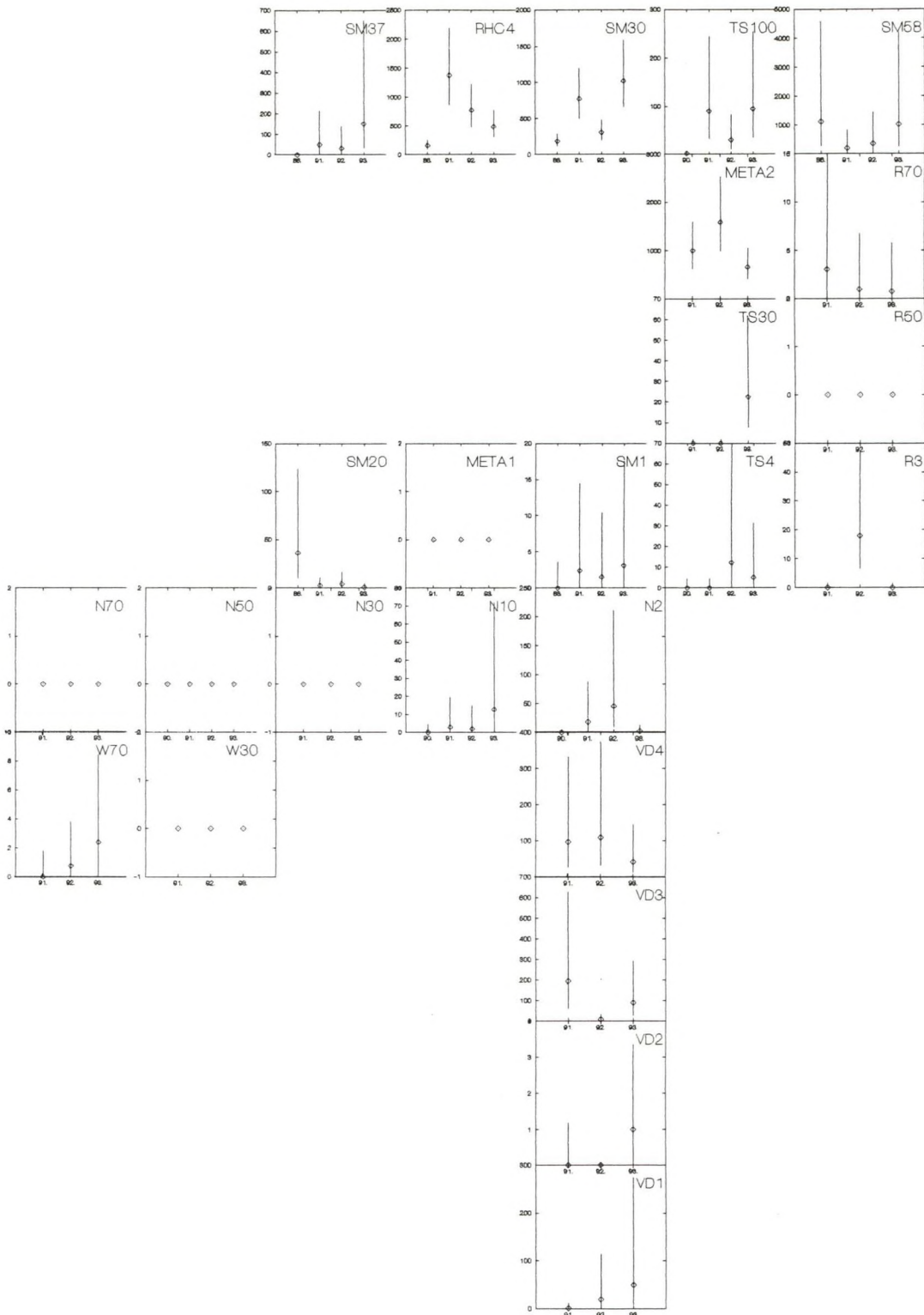


Fig. 3i. Comparison plots of *Mysella bidentata* (ind/m²), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



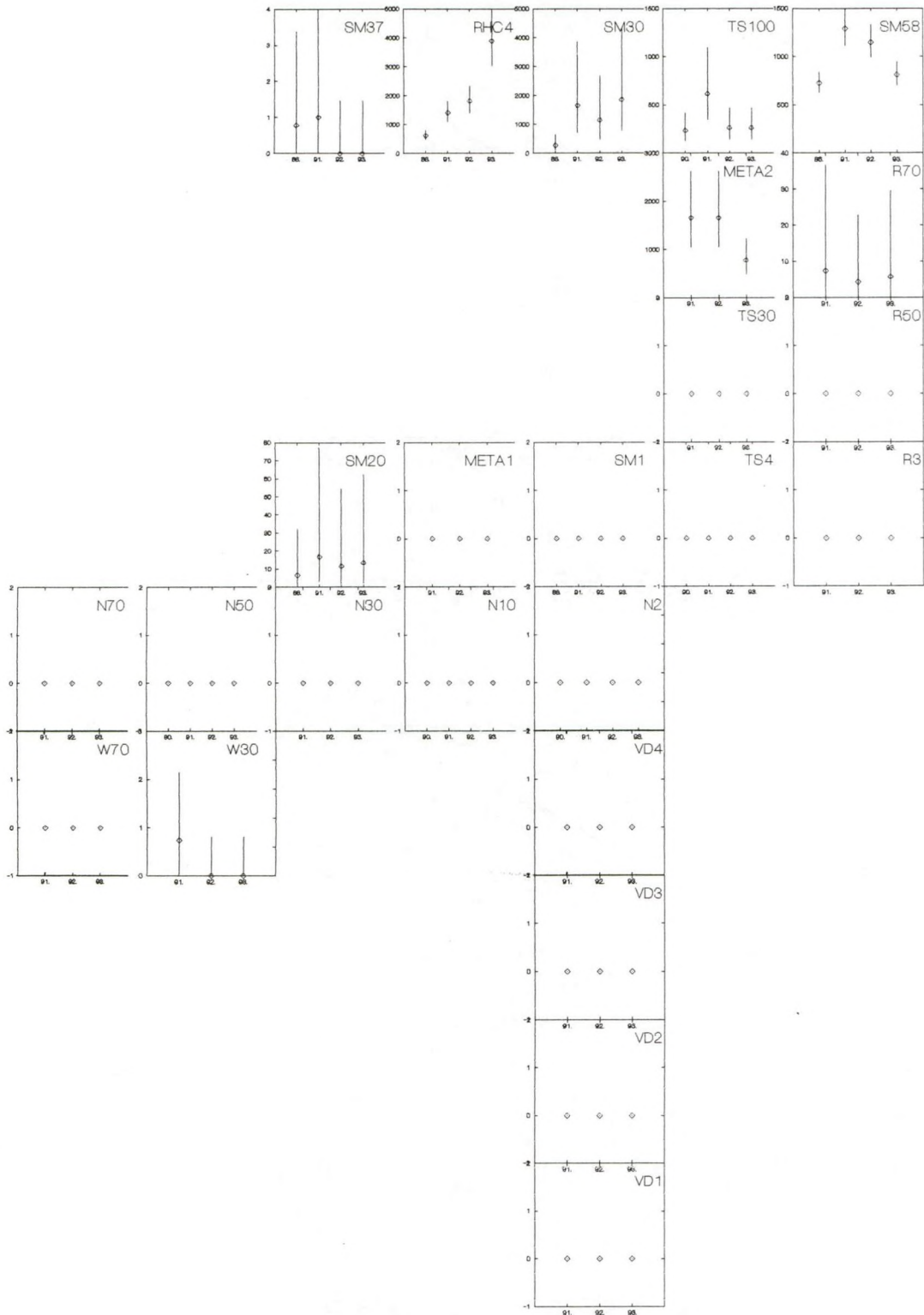


Fig. 3j. Comparison plots of *Amphiura filiformis* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

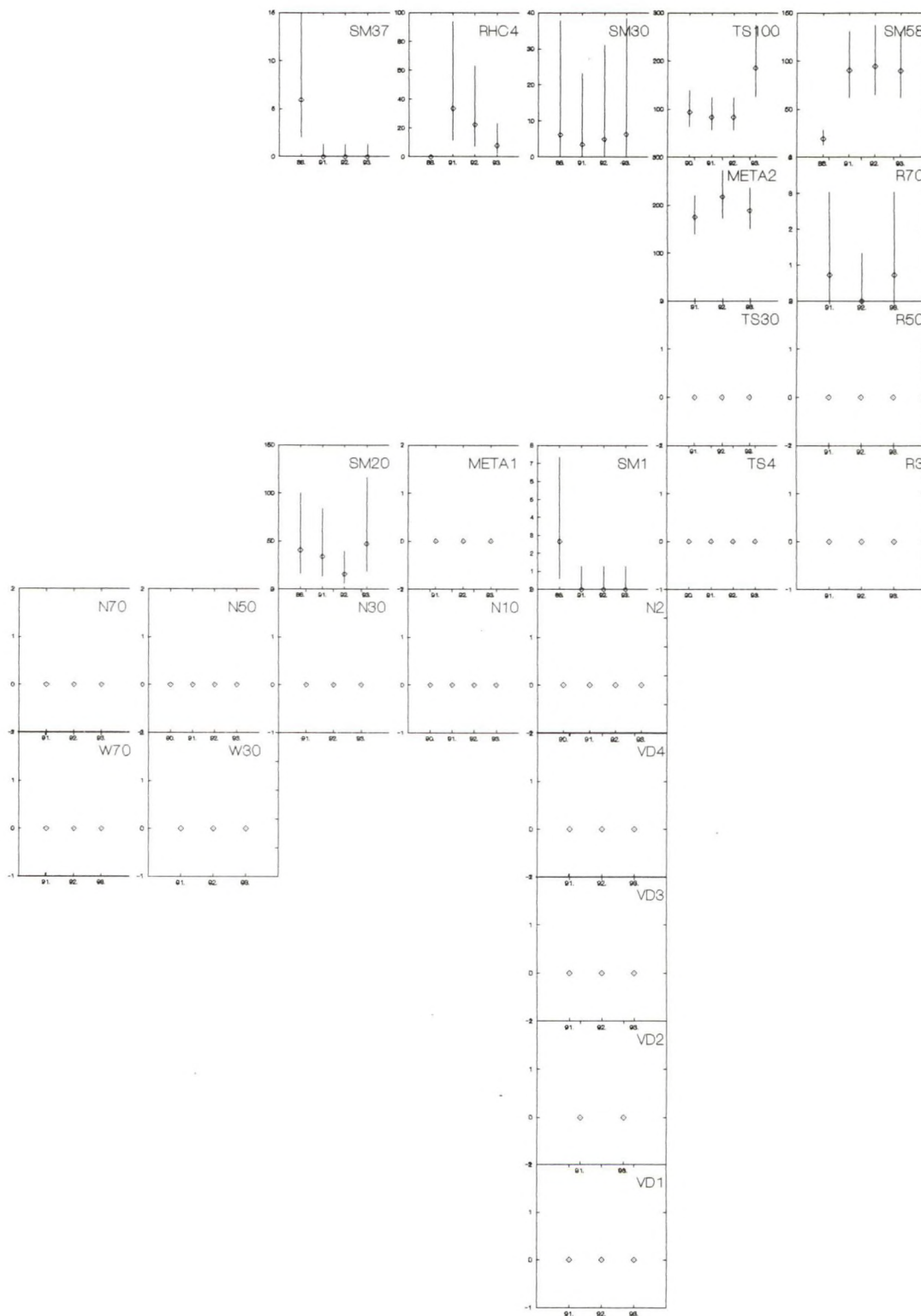


Fig. 3k. Comparison plots of *Callianassa subterranea* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



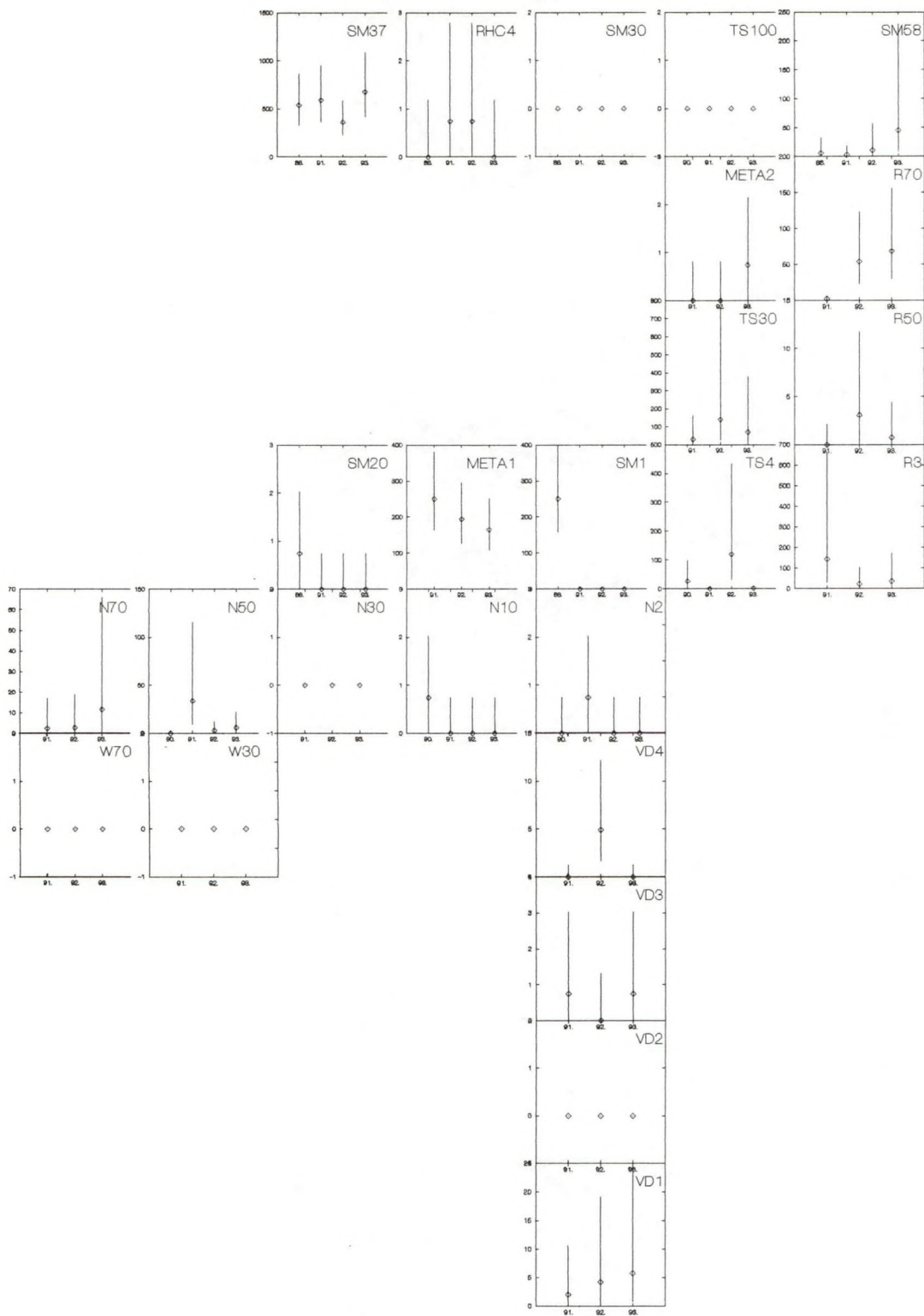


Fig. 31. Comparison plots of *Bathyporeia elegans* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

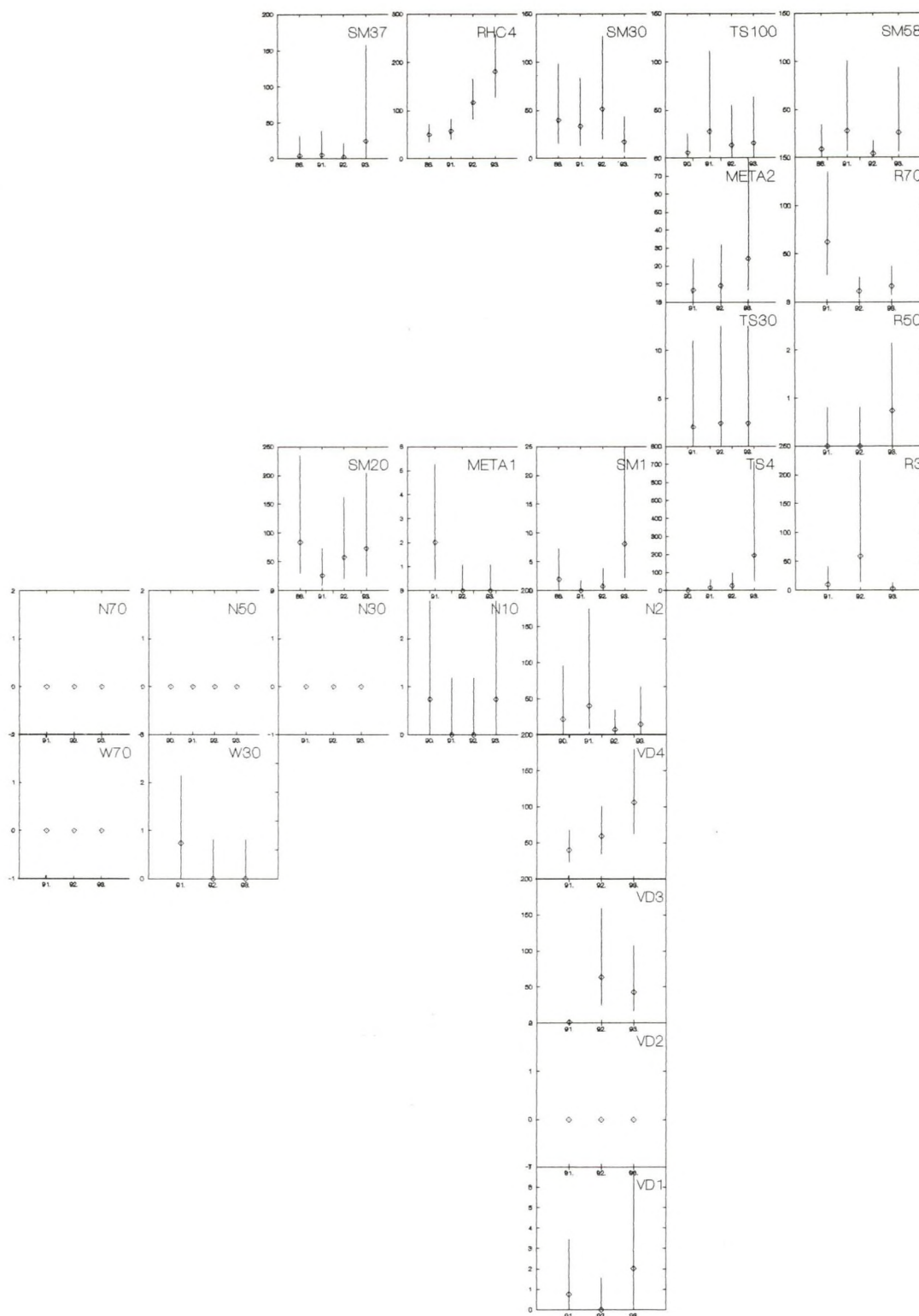


Fig. 3m. Comparison plots of *Nephtys hombergii* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



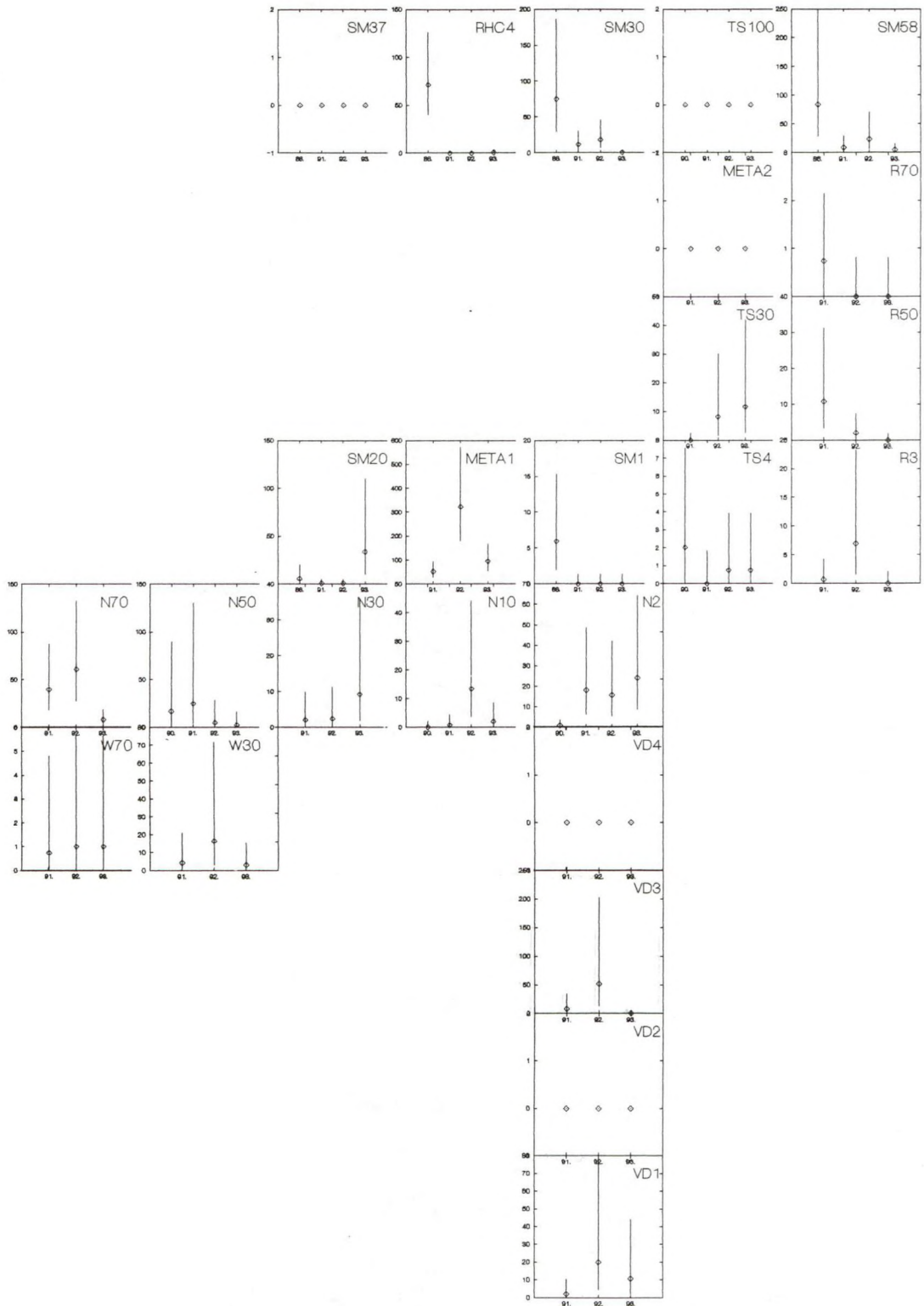


Fig. 3n. Comparison plots of *Scoloplos armiger* (ind/m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

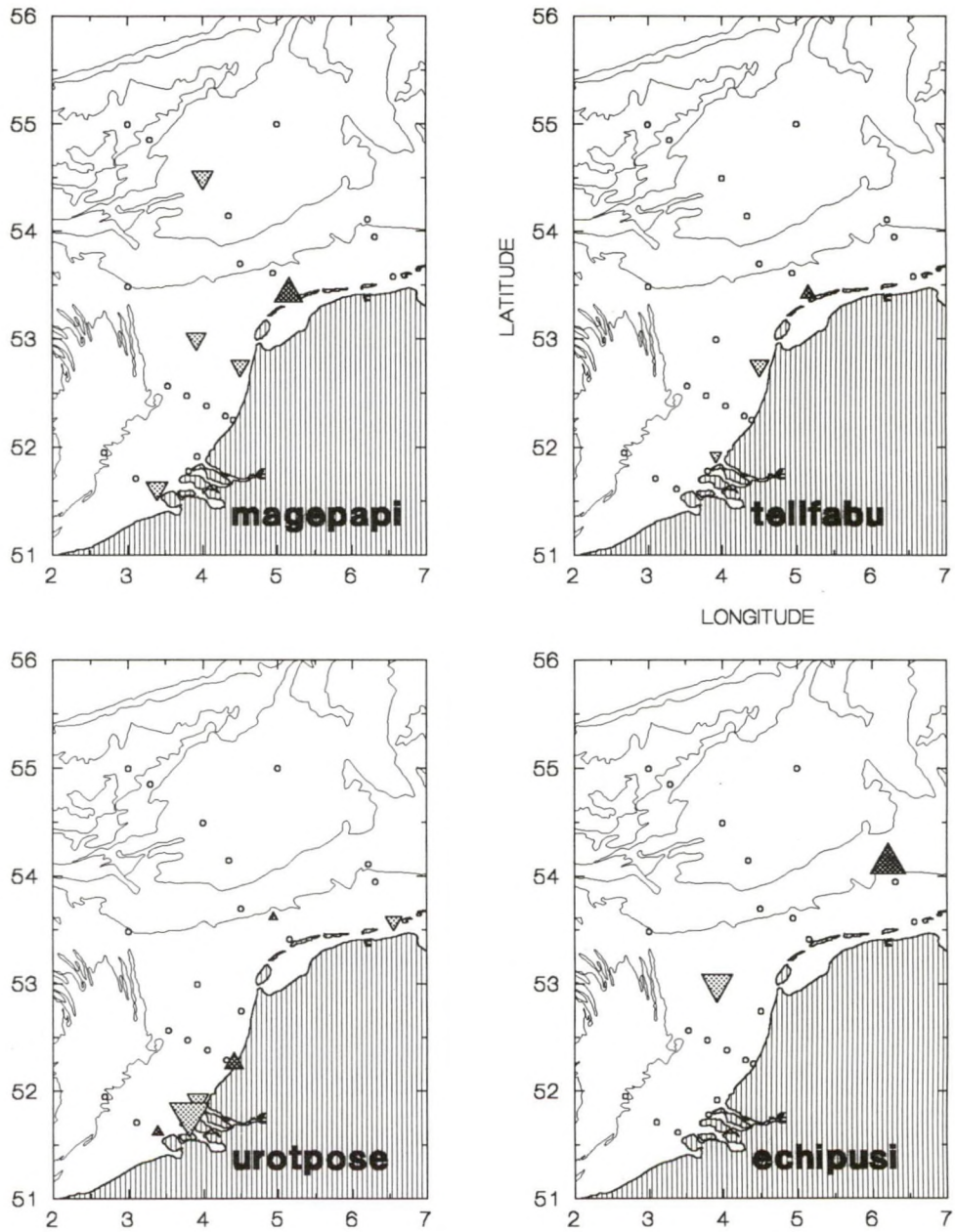


Fig. 4a. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.



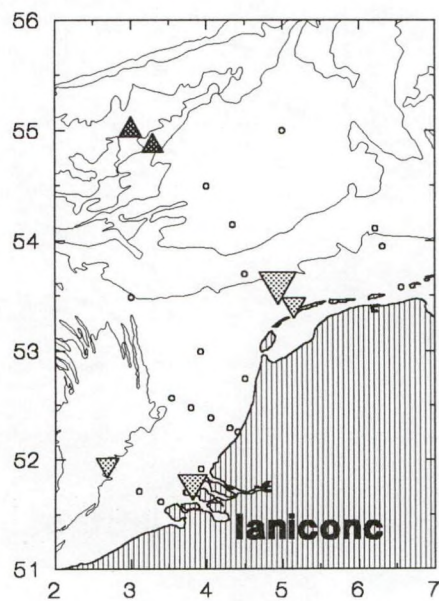
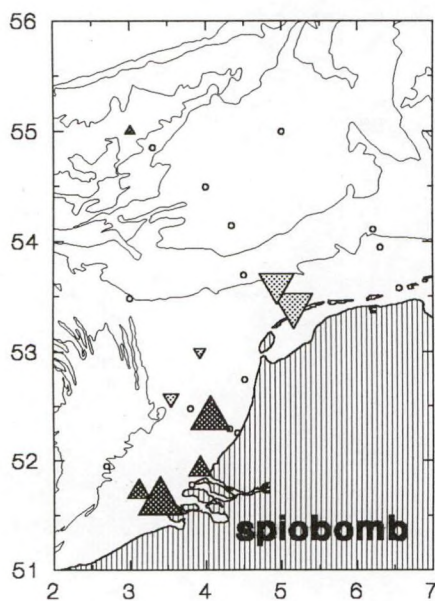
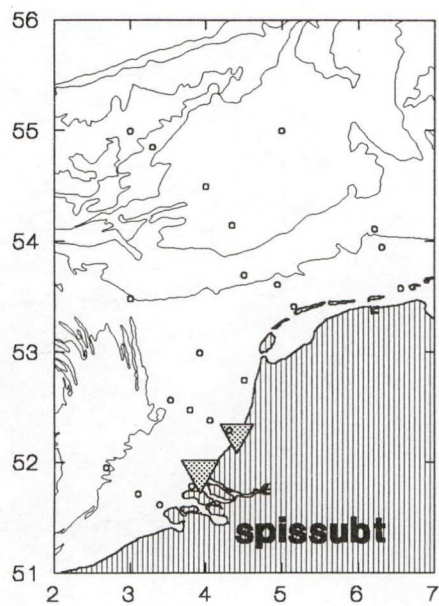
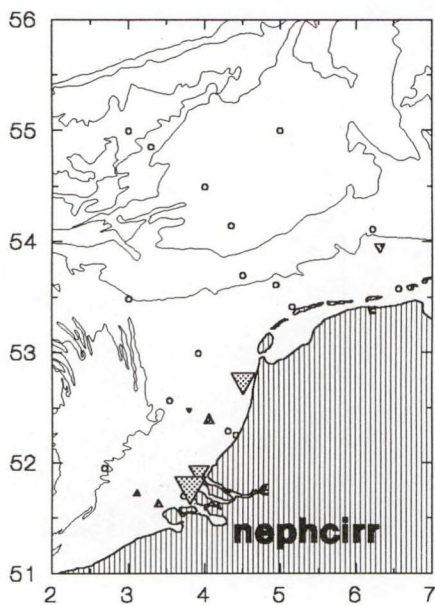


Fig. 4b. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.

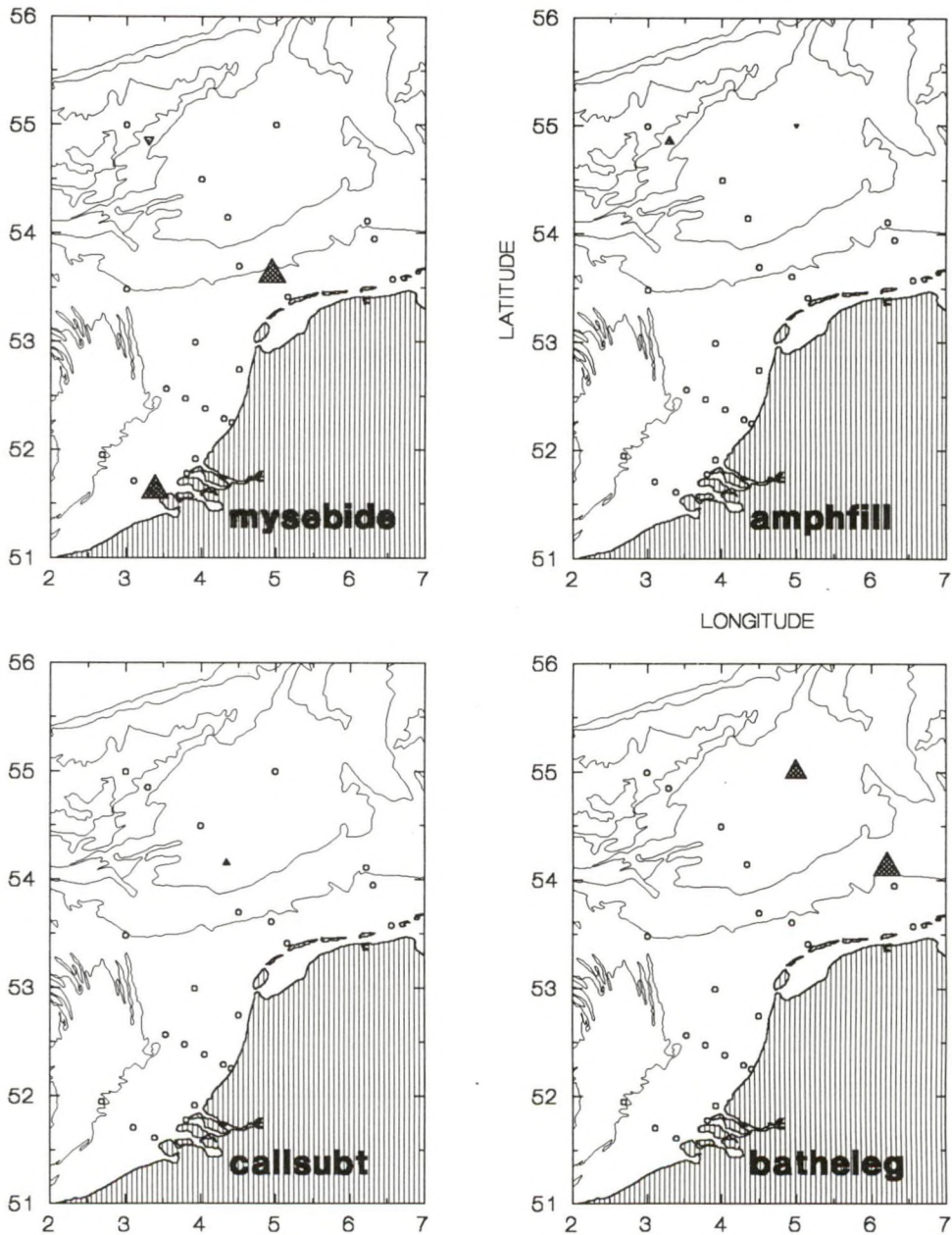


Fig. 4c. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.



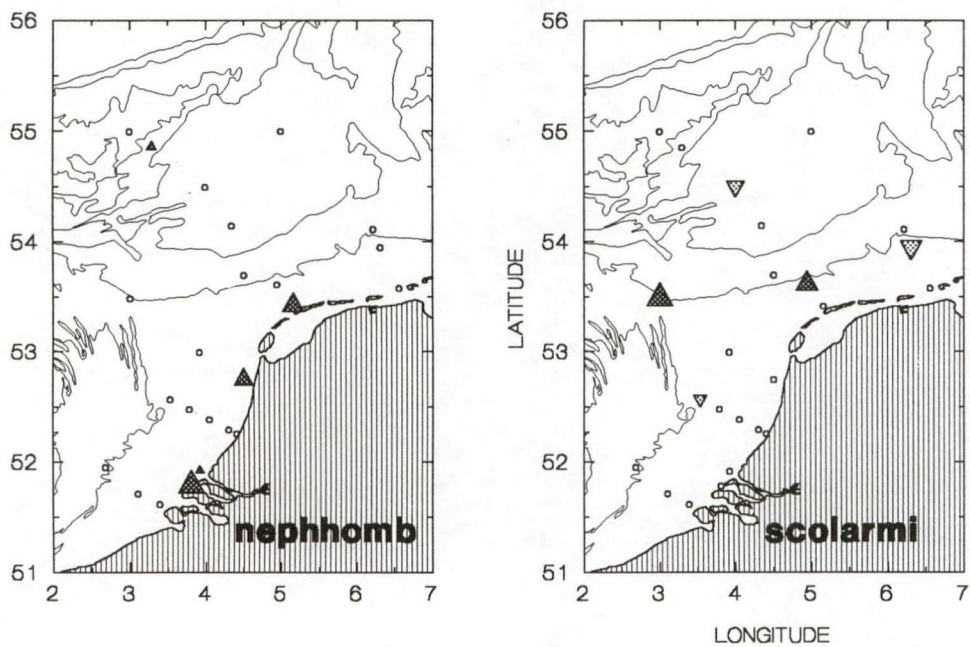
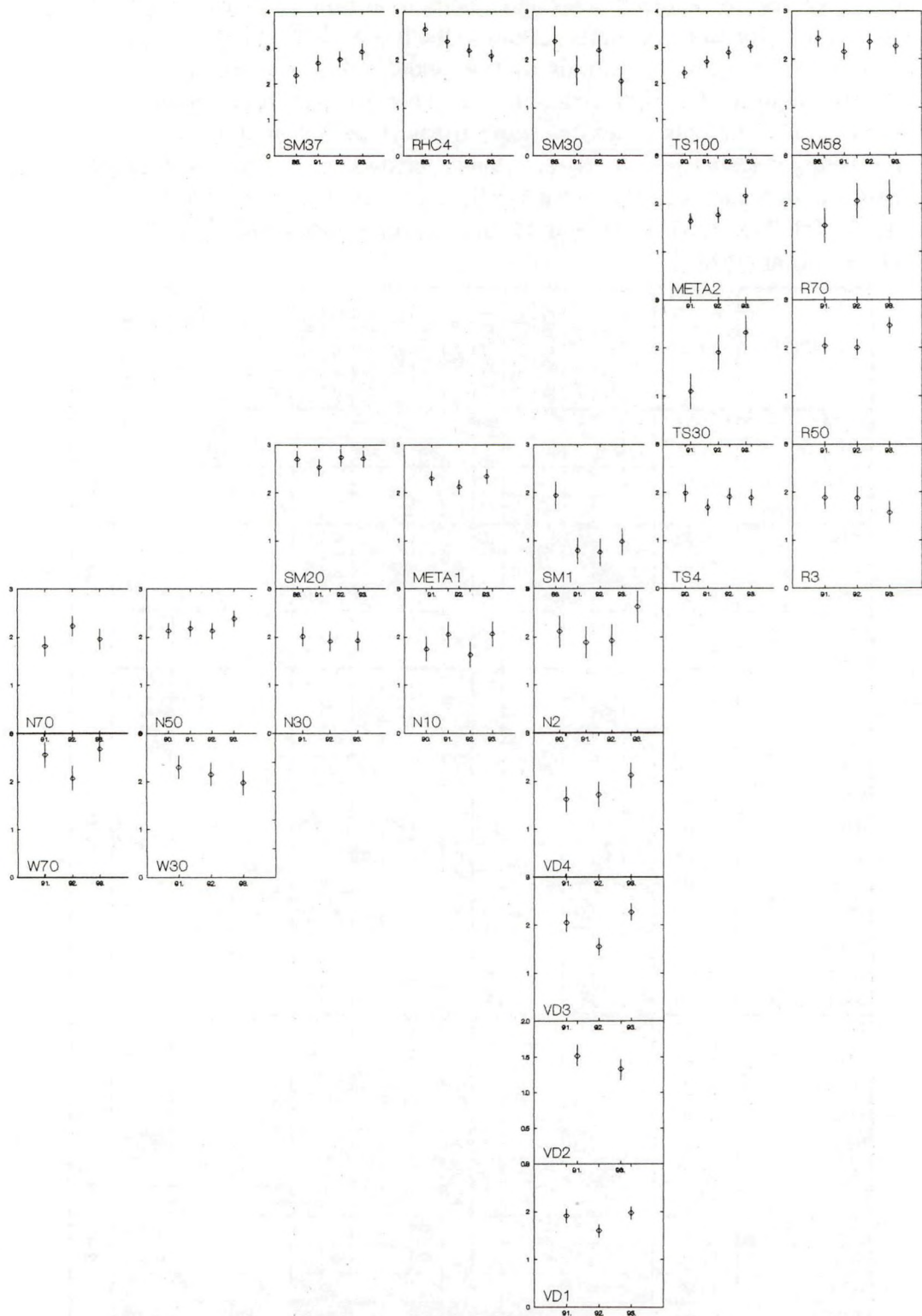


Fig. 4d. Trend-like changes in species density at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.

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 | CRUSBOM | ECHIBOM | MOLLBOM | POLYBOM | MISCBOM | 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  |      |         |          |          |          |          |          |          |          |          |          |          |          |         |         |         |         |         | COASTAL  |
| R3               | 91-93  |      |         |          |          |          |          |          |          |          |          |          |          |          |         |         |         |         |         |          |
| 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.**

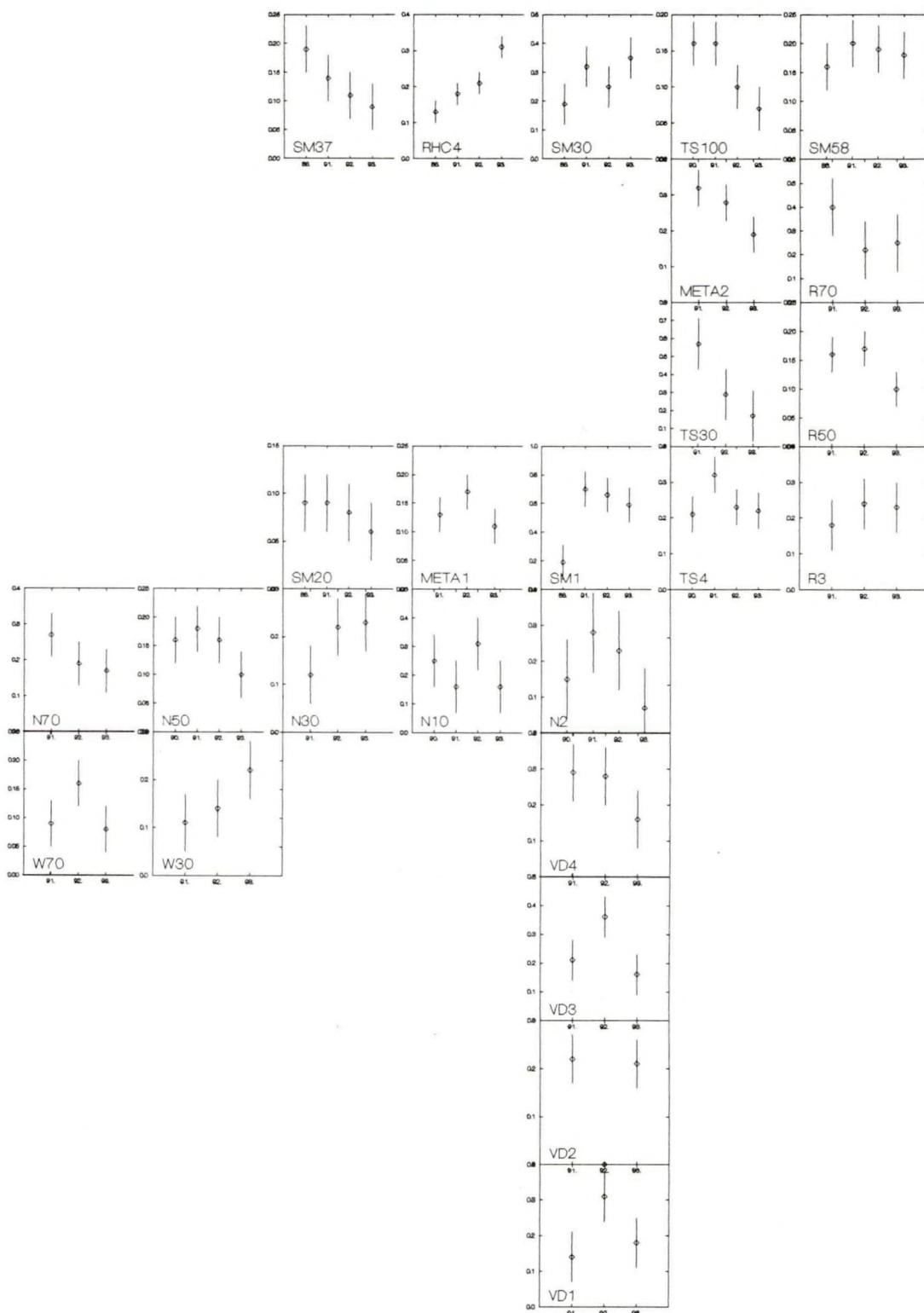


Fig. 5b. Comparison plots with Simpson's dominance figures, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



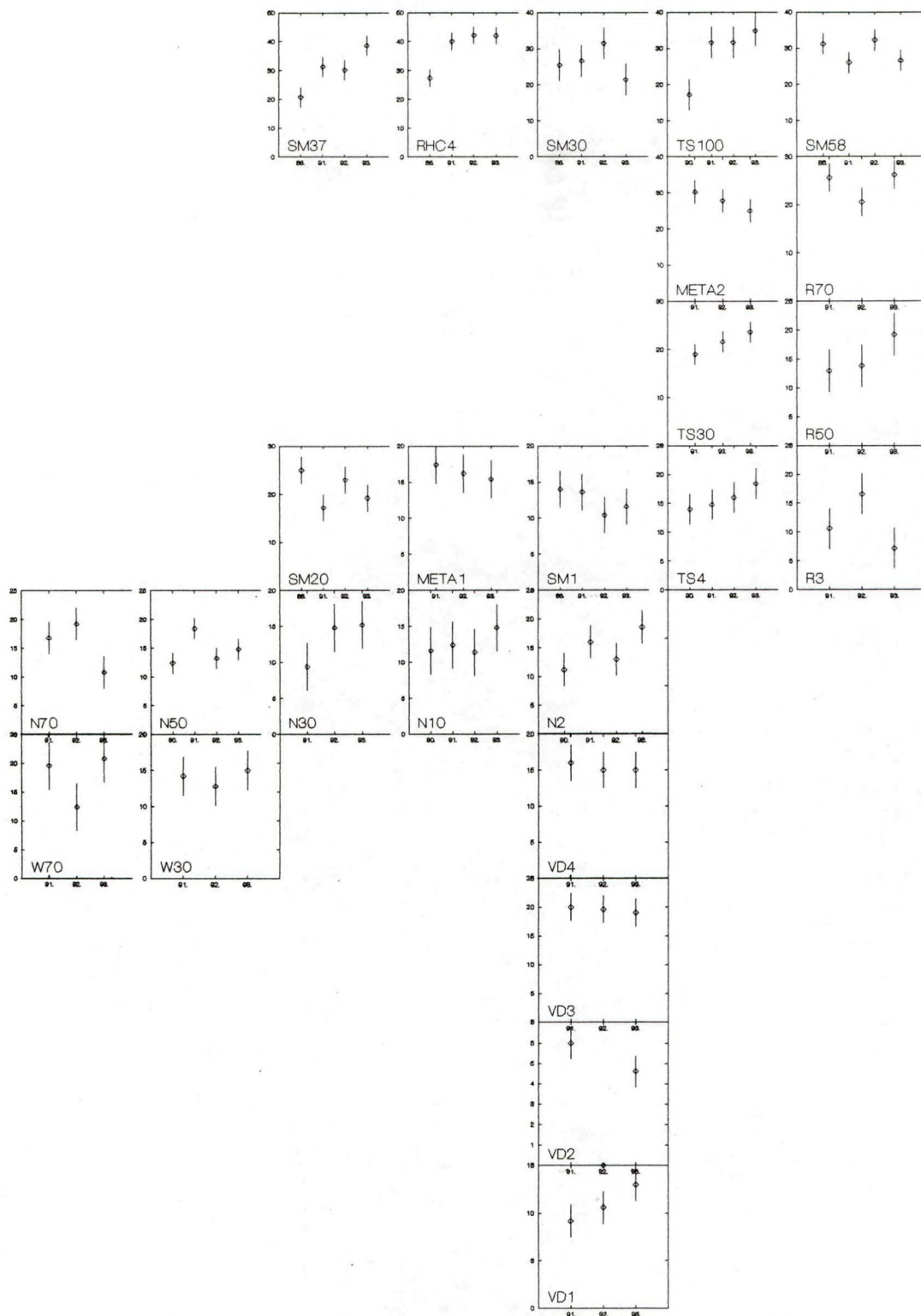


Fig. 5c. Comparison plots with the total number of species per sample, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

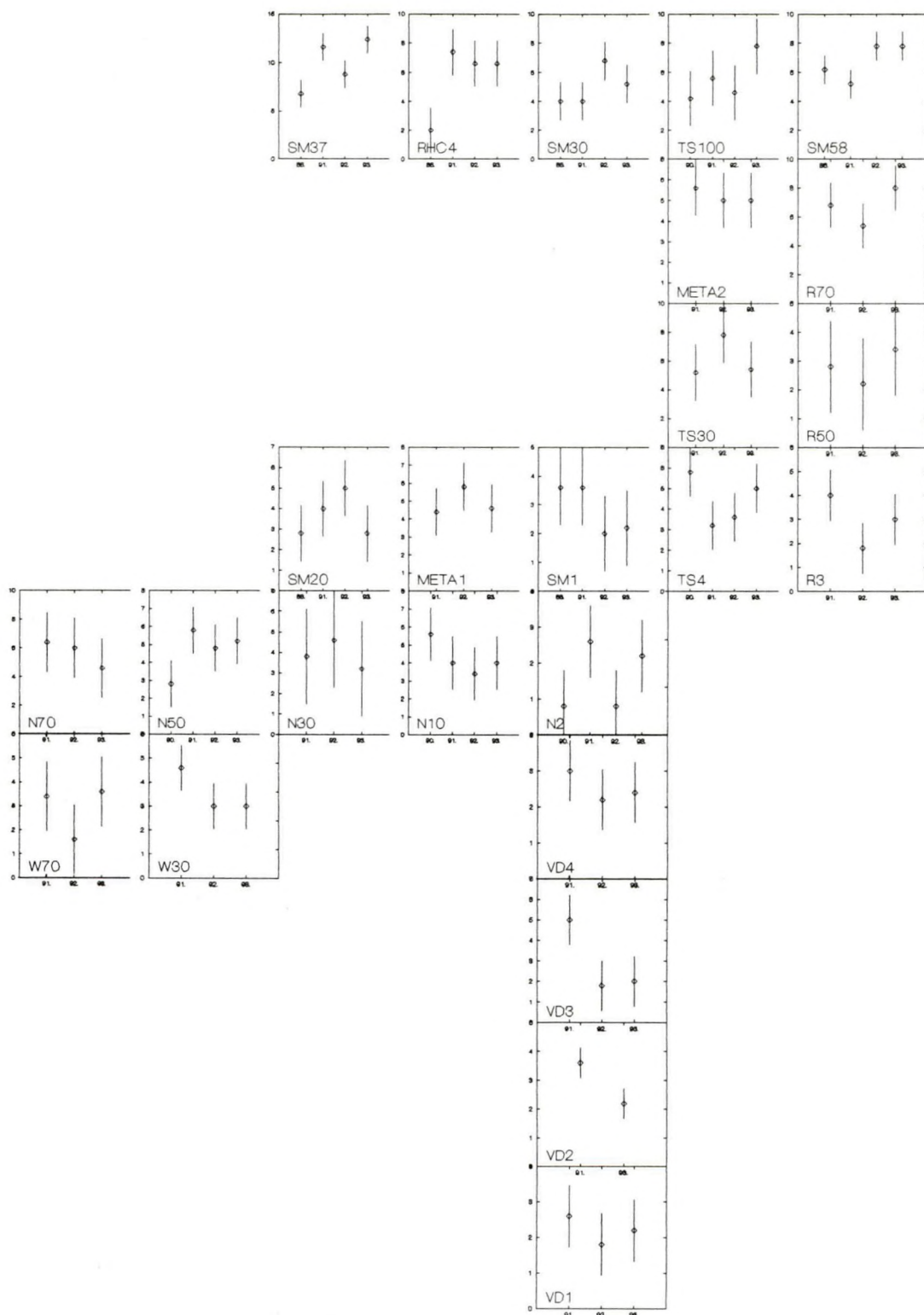


Fig. 5d. Comparison plots with the total number of Crustacean species per sample, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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



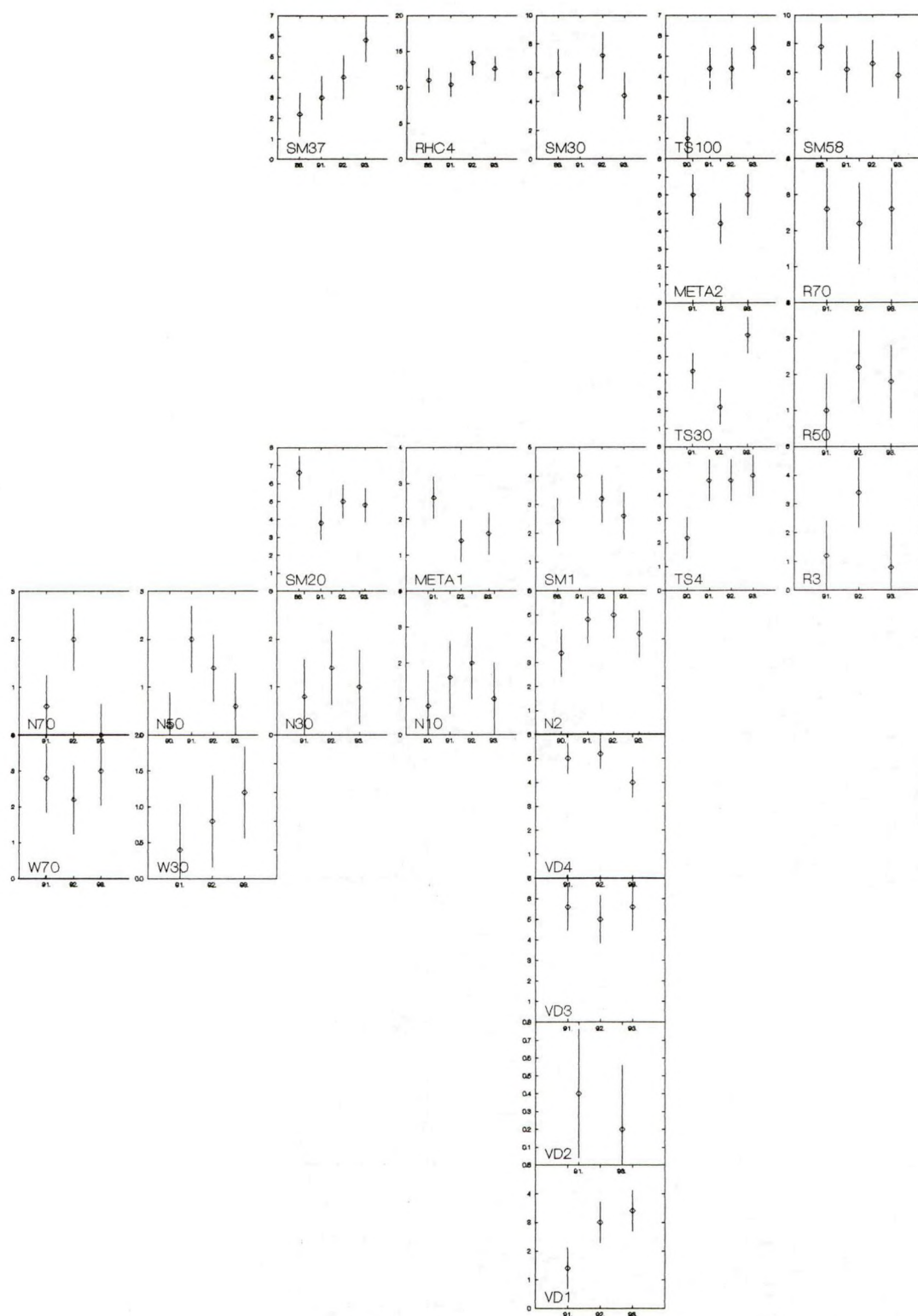


Fig. 5e. Comparison plots with the total number of Mollusc species per sample, for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

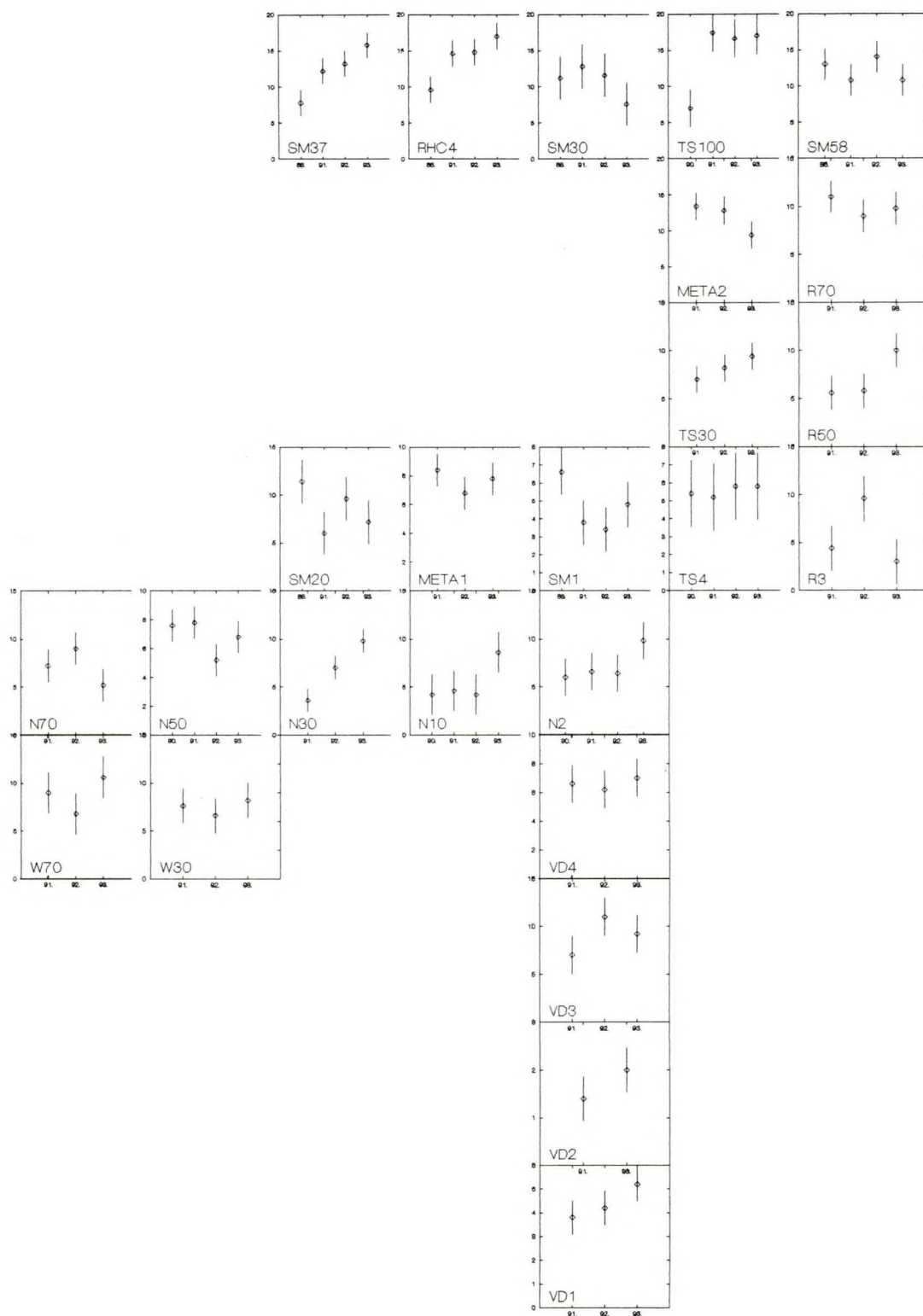


Fig. 5f. Comparison plots with the total number of Polychaete species per sample, for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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



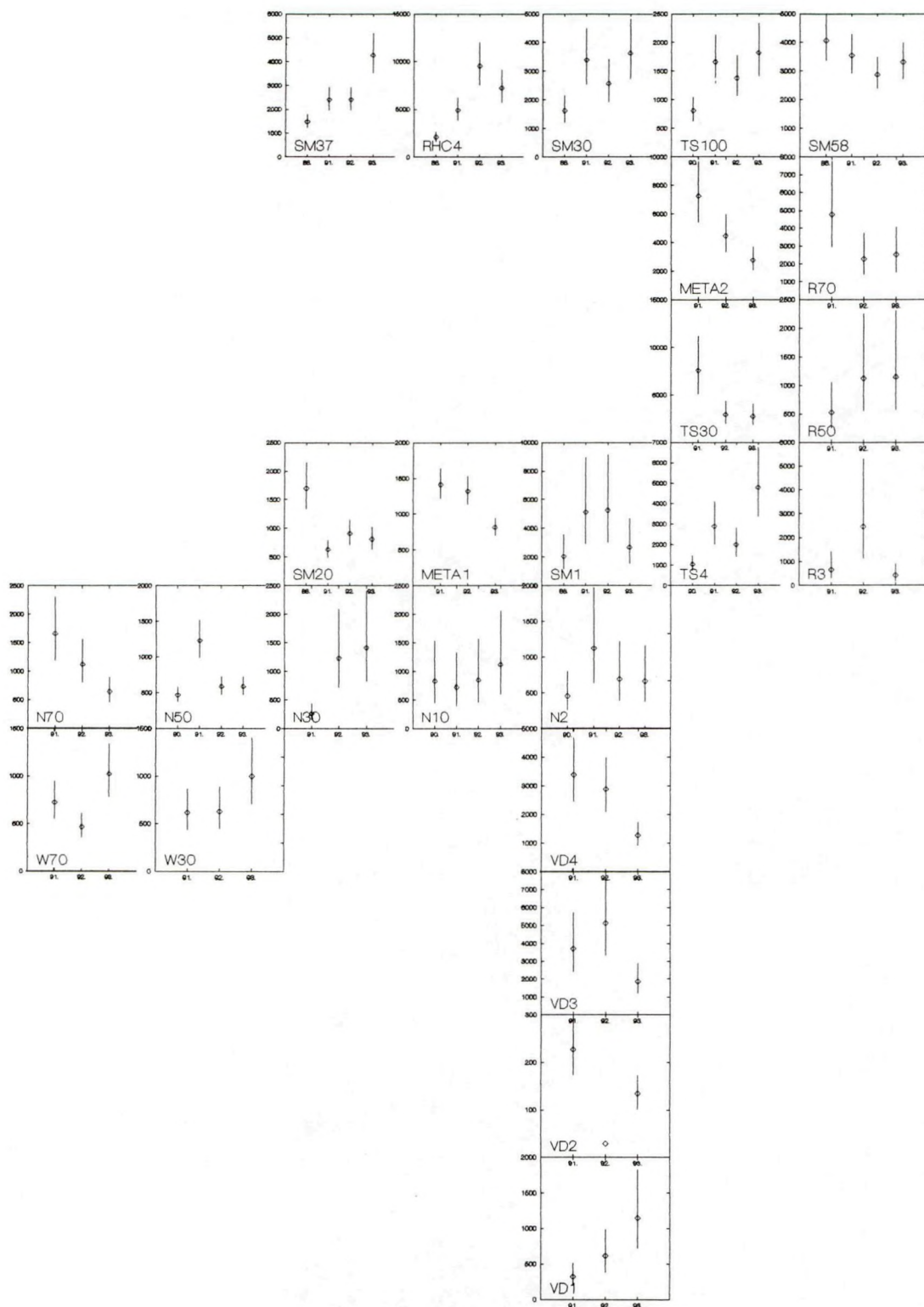


Fig. 5g. Comparison plots with the total density (ind./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

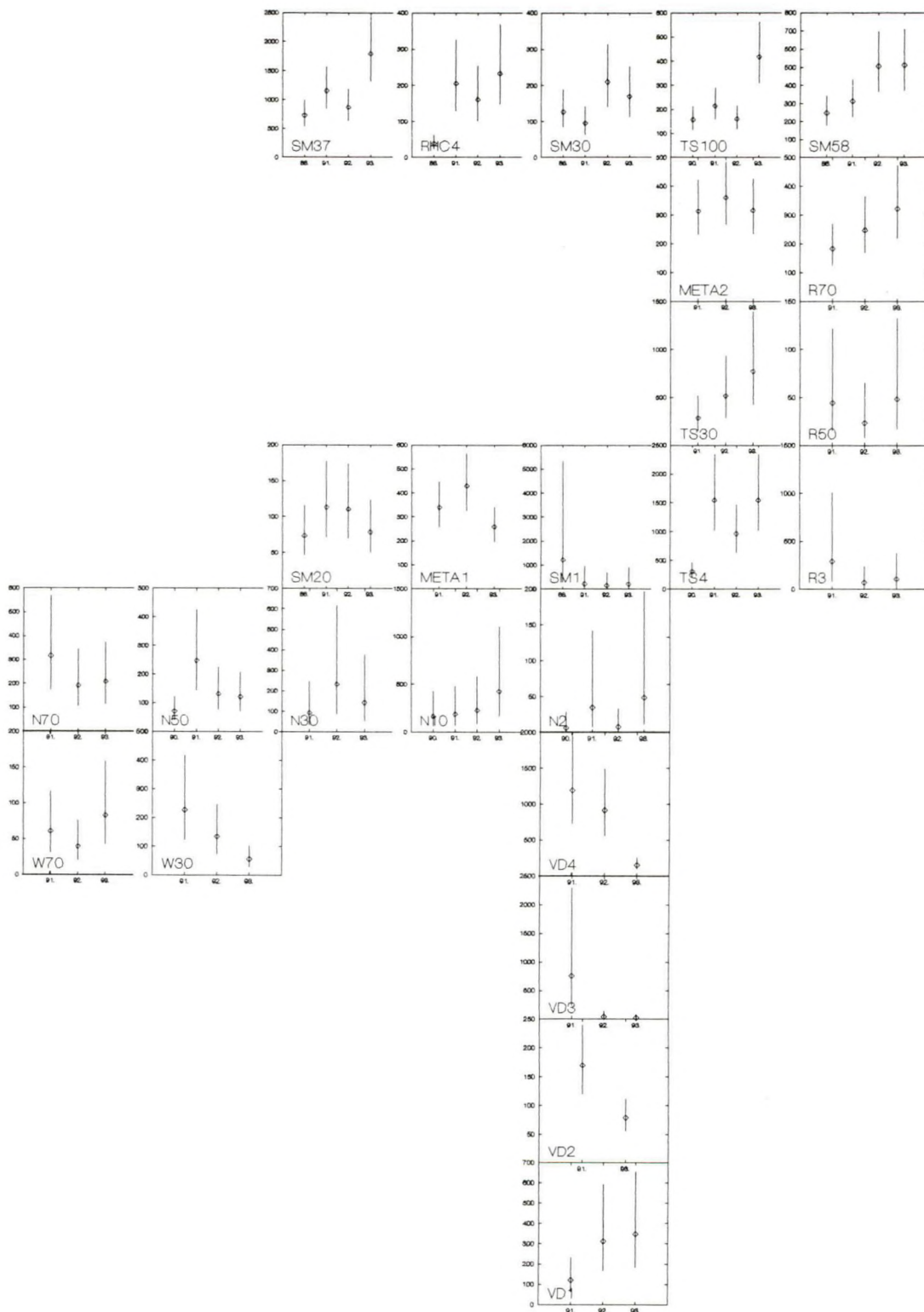


Fig. 5h. Comparison plots with the density of the Crustaceans (ind./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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



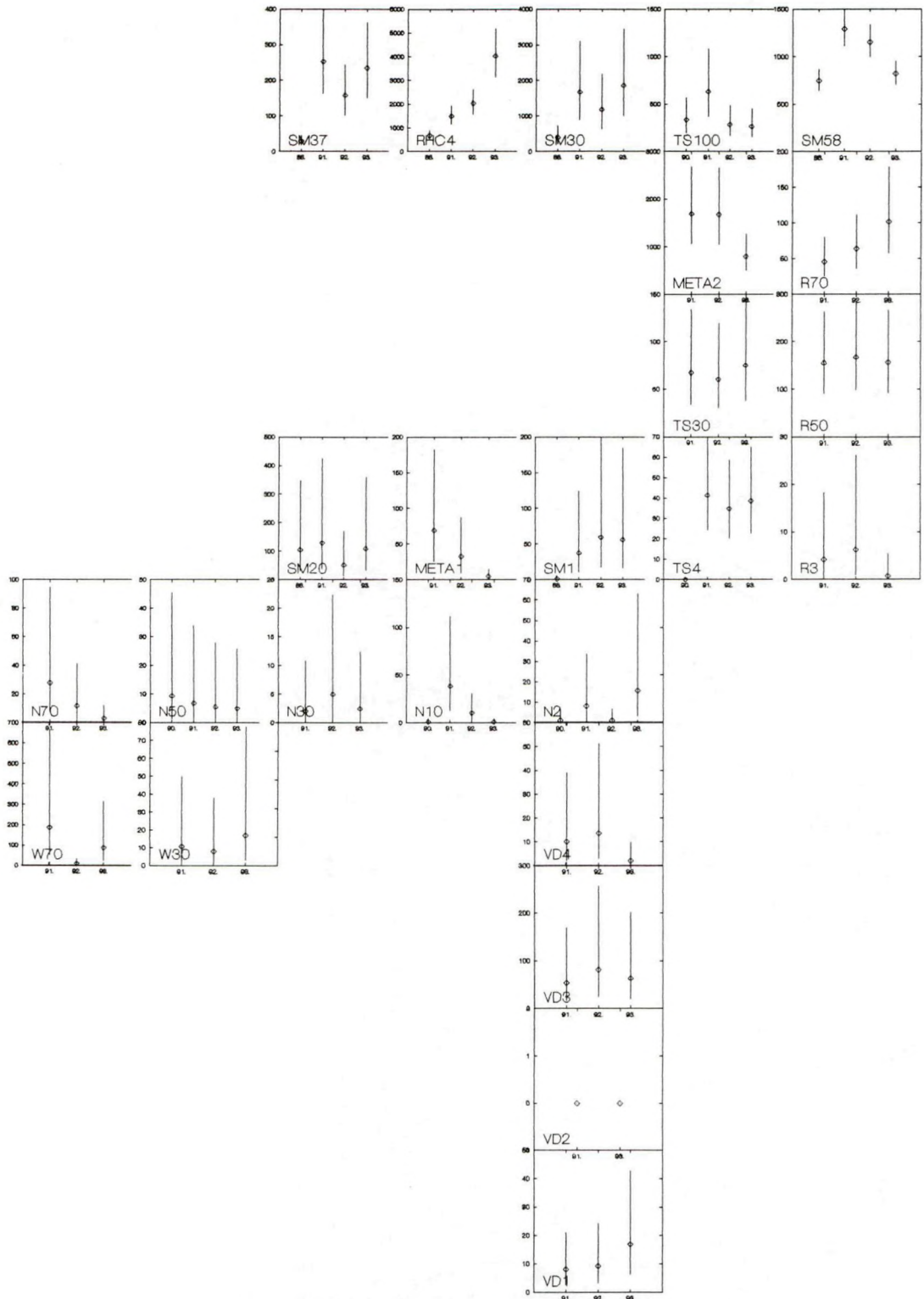


Fig. 5i. Comparison plots with the density of the Echinoderms (ind./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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

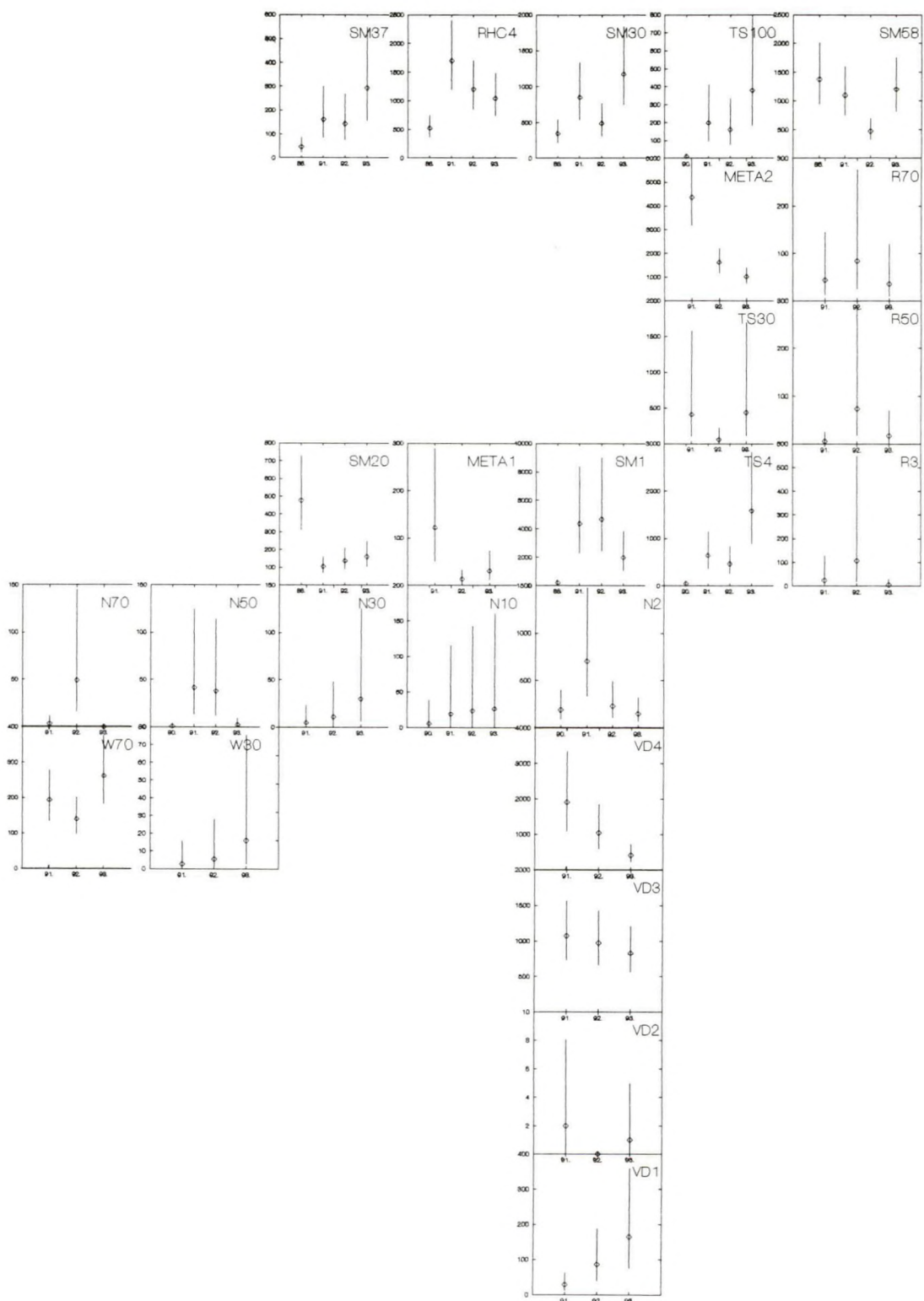


Fig. 5j. Comparison plots with the density of the Molluscs (ind./m²), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



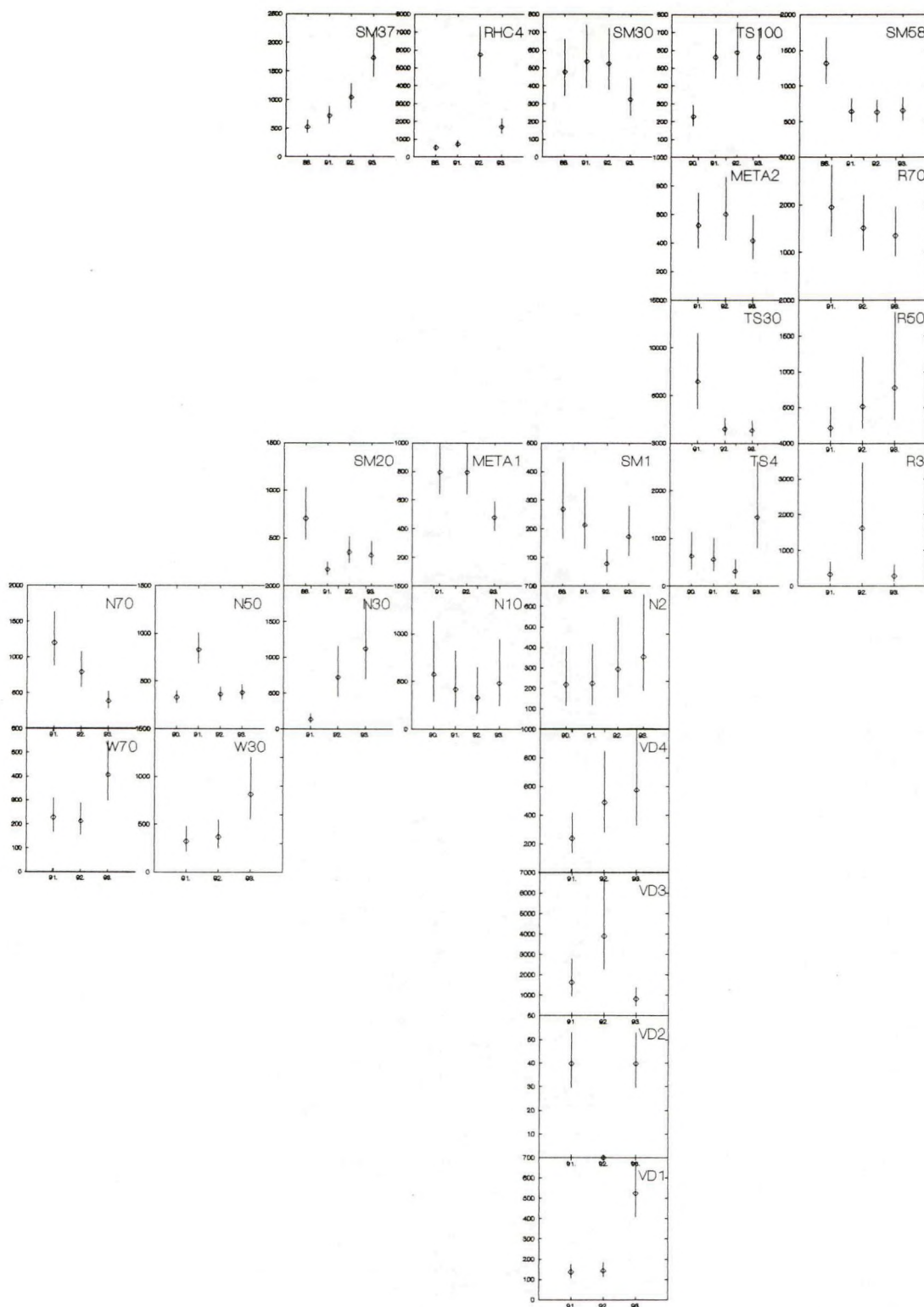


Fig. 5k. Comparison plots with the density of the Polychaetes (ind./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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

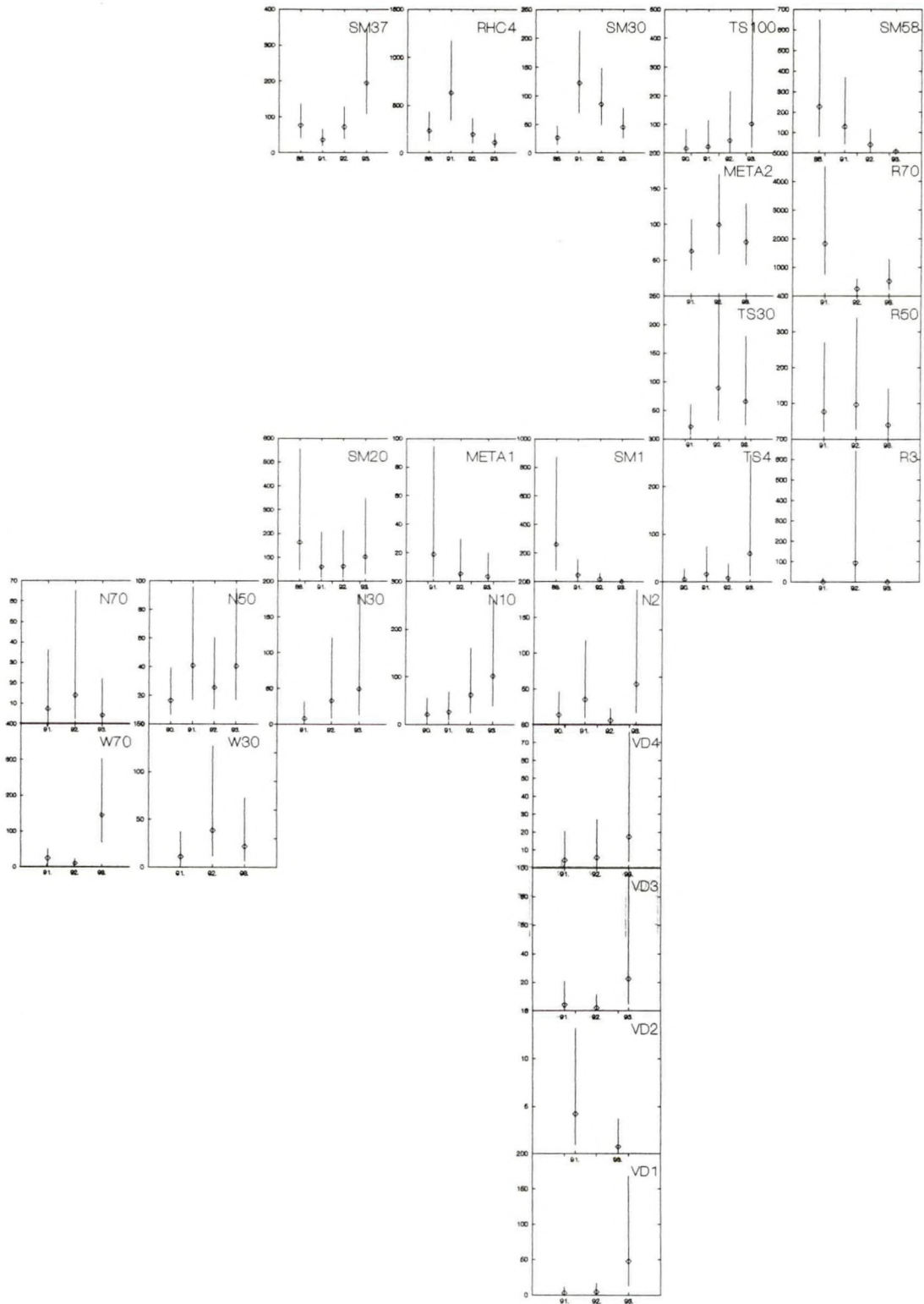


Fig. 51. Comparison plots with the density of the Miscellaneous species (ind./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the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



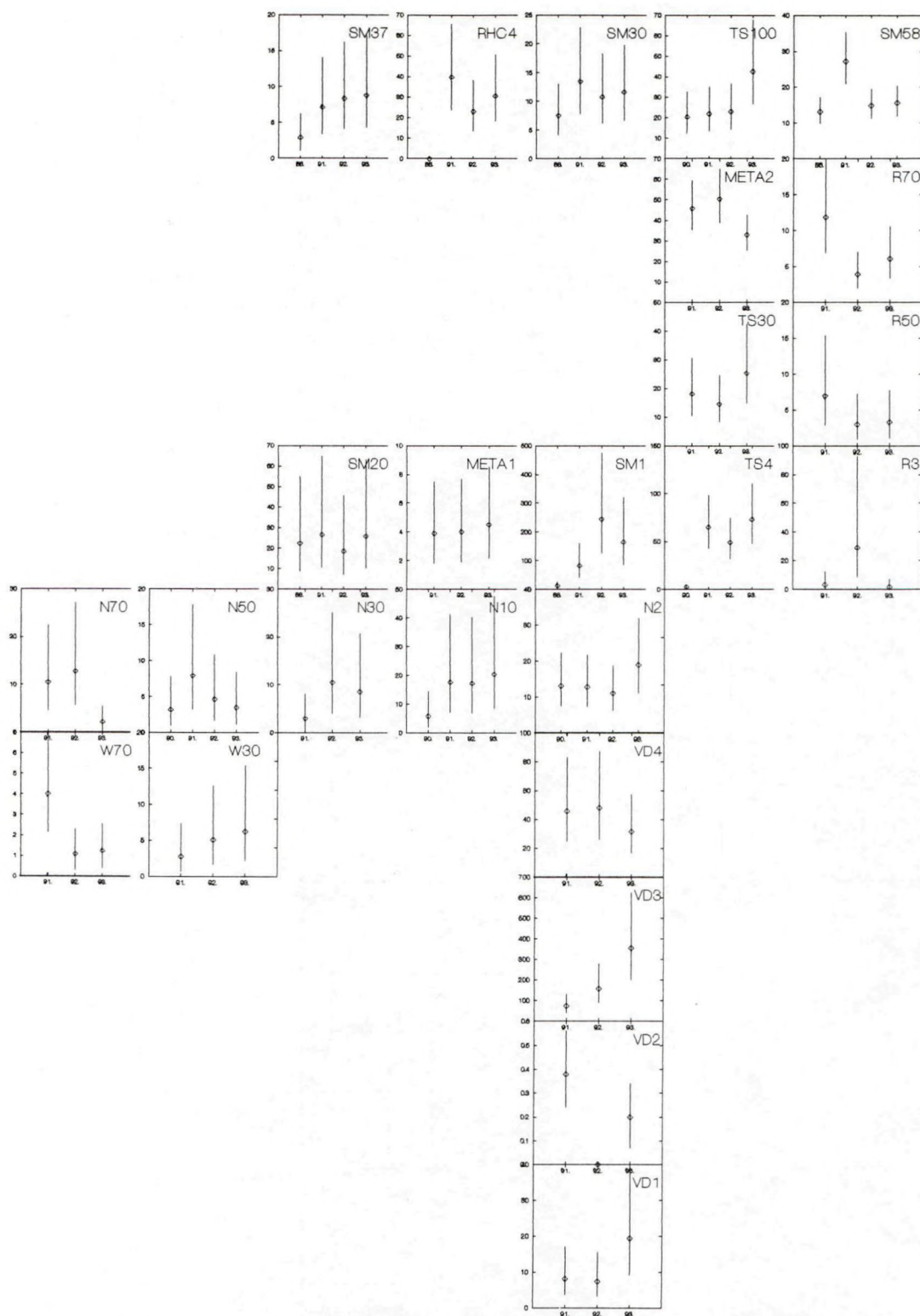


Fig. 5m. Comparison plots with the total biomass of the species (g.AFDW./m<sup>2</sup>), for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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

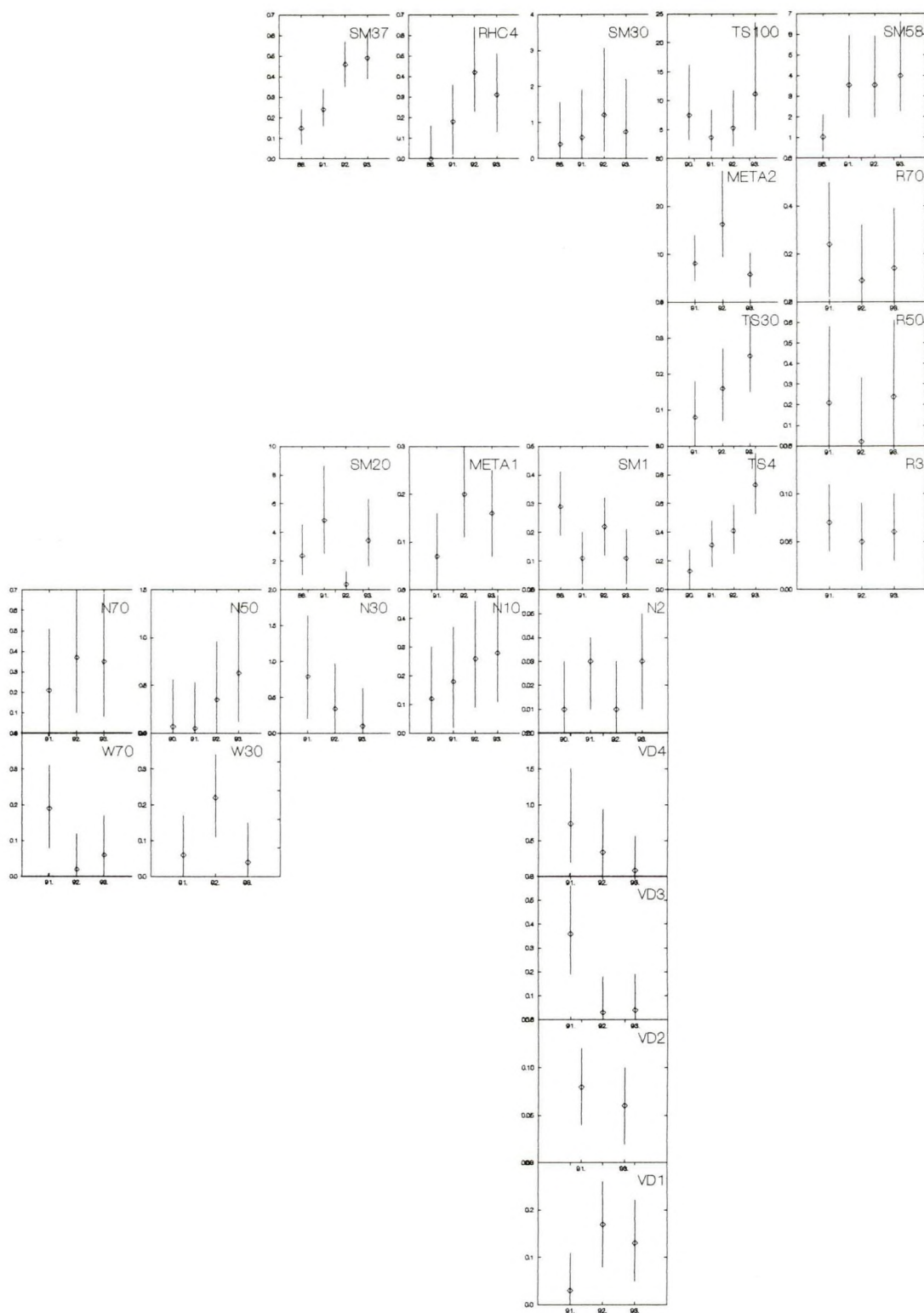


Fig. 5n. Comparison plots with the total biomass of the Crustaceans ( $\text{g.AFDW./m}^2$ ), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the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



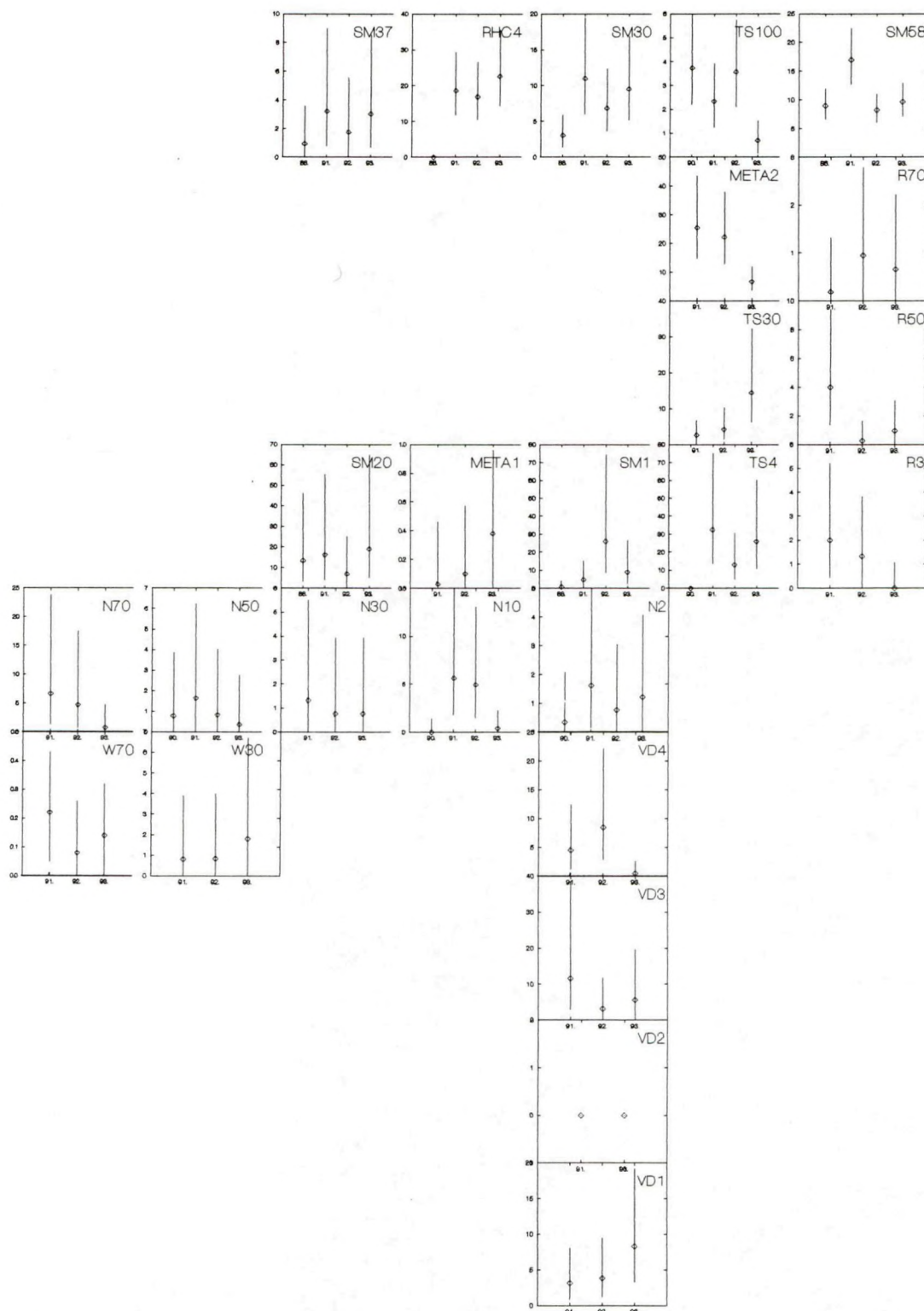


Fig. 50. Comparison plots with the total biomass of the Echinoderms (g.AFDW./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.

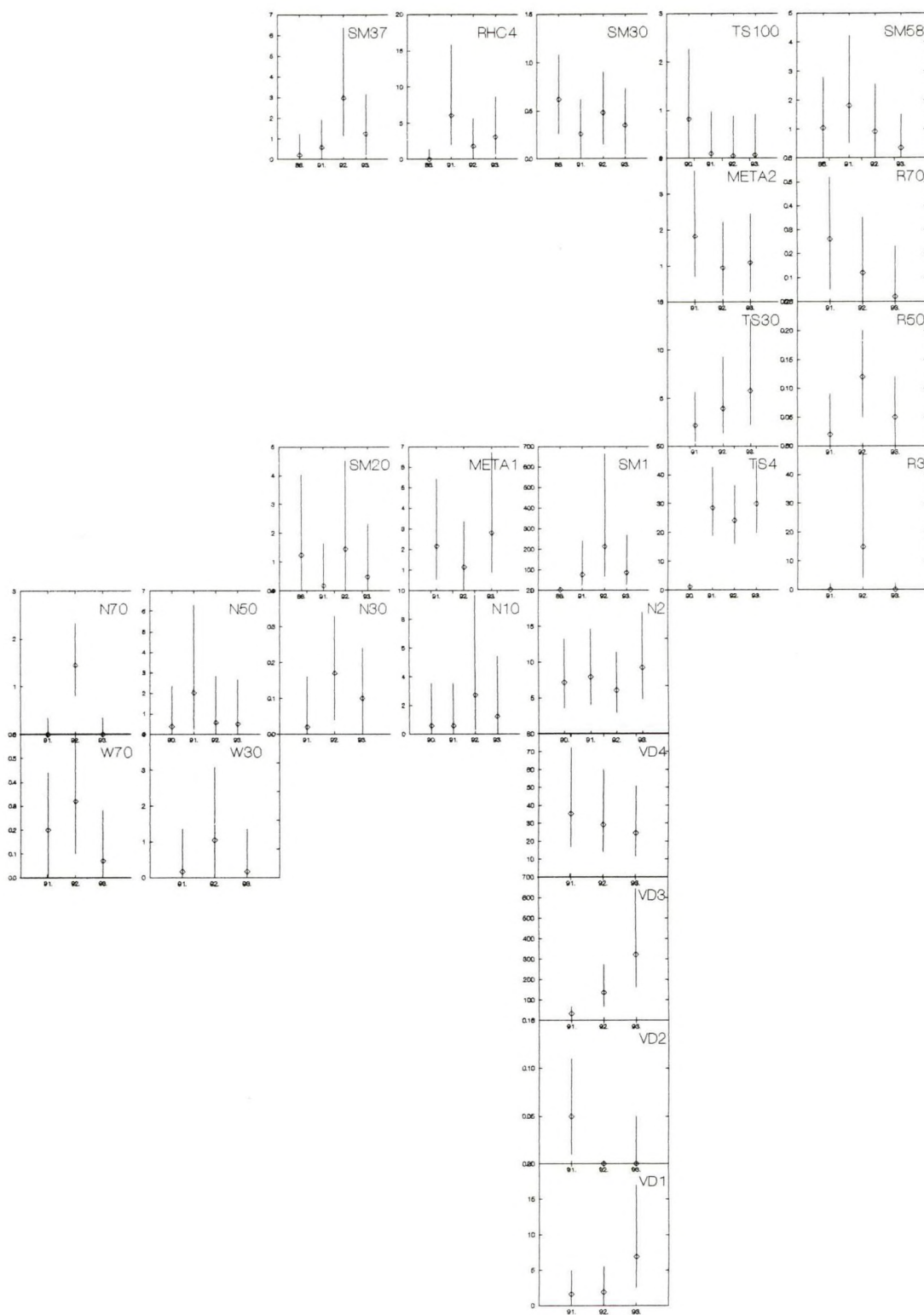


Fig. 5p. Comparison plots with the total biomass of the Molluscs (g.AFDW./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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



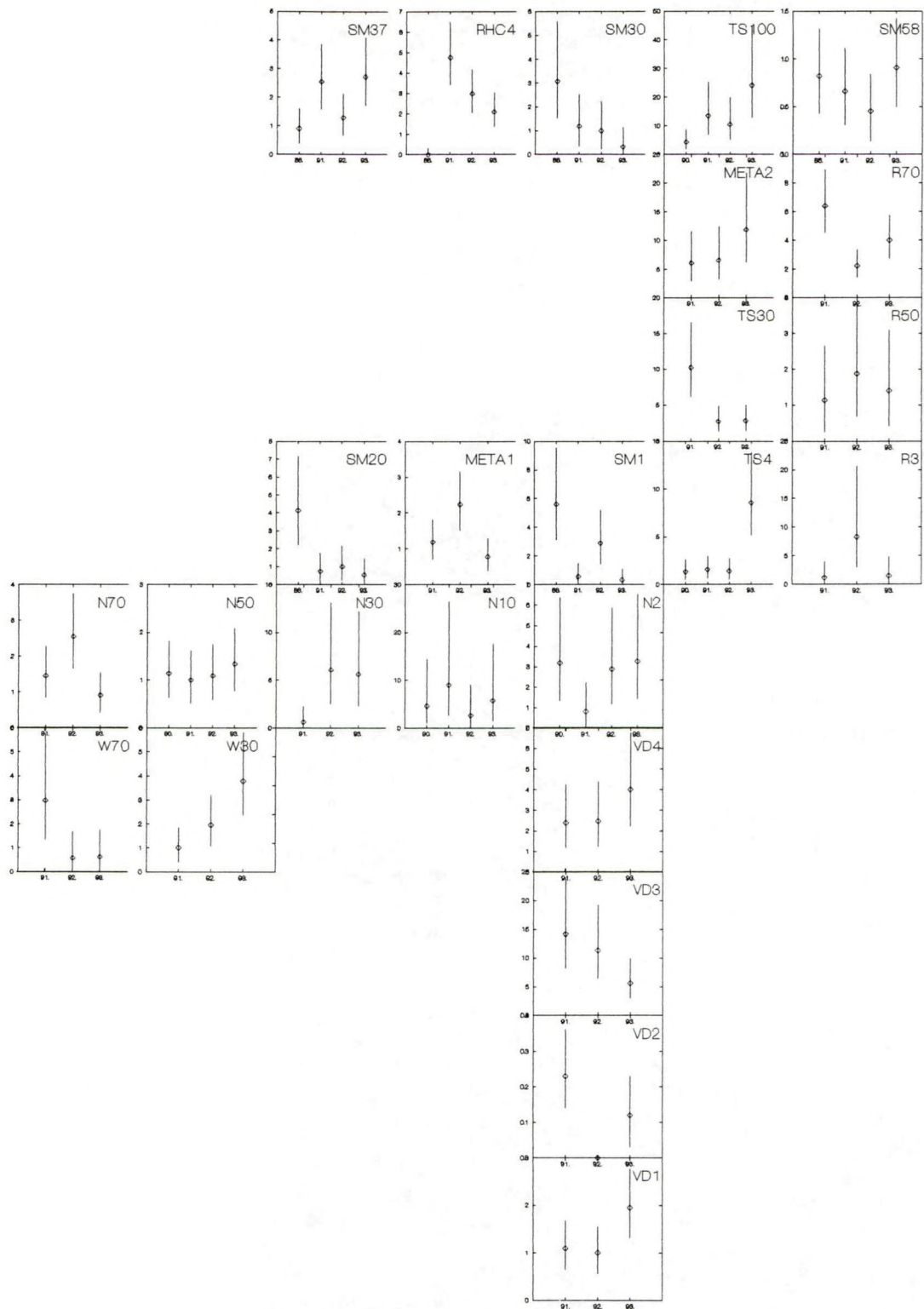


Fig. 5q. Comparison plots with the total biomass of the Polychaetes (g.AFDW./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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

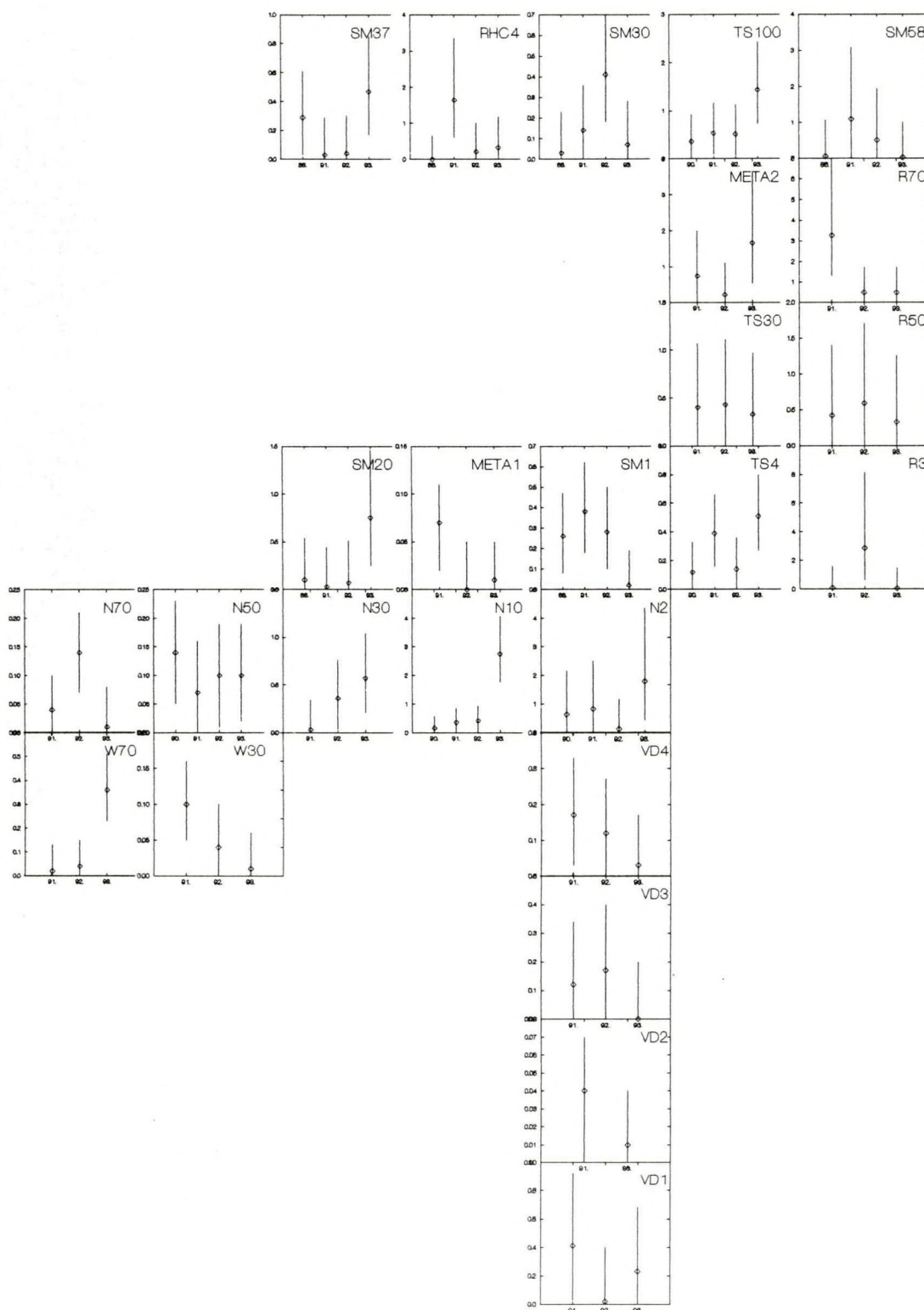


Fig. 5r. Comparison plots with the total biomass of the Miscellaneous species (g.AFDW./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between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



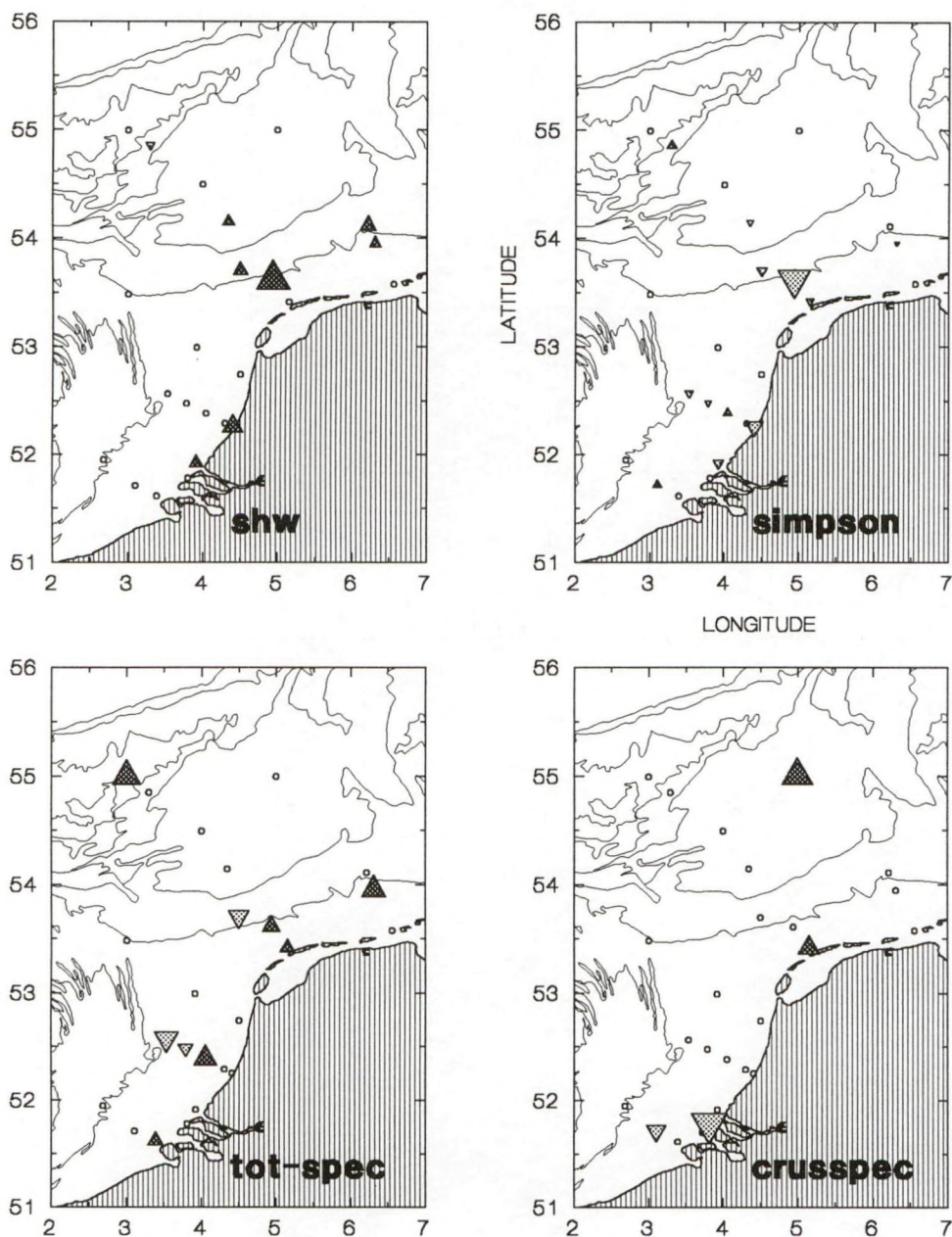


Fig. 6a. Trend-like changes in community attributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.

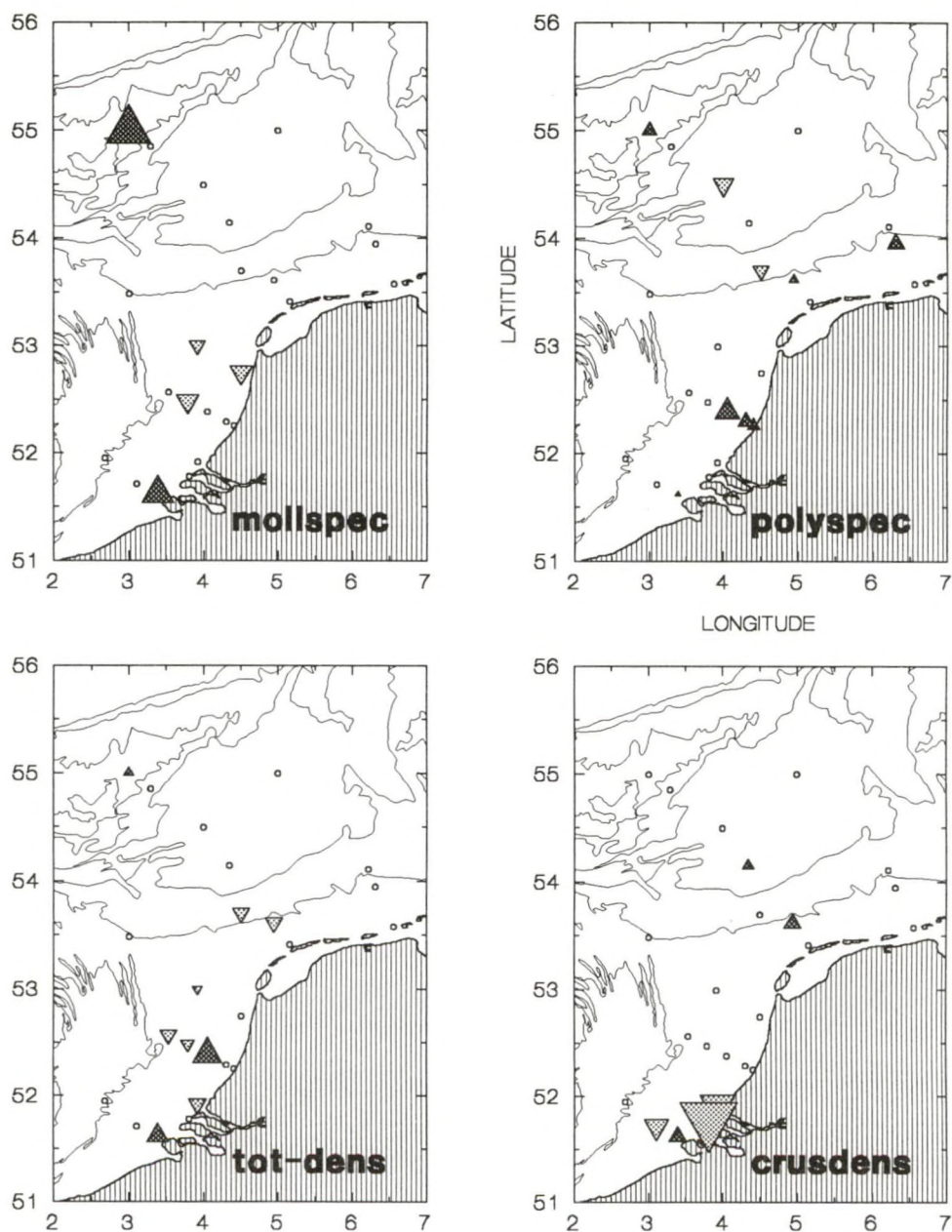


Fig. 6b. Trend-like changes in community attributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.



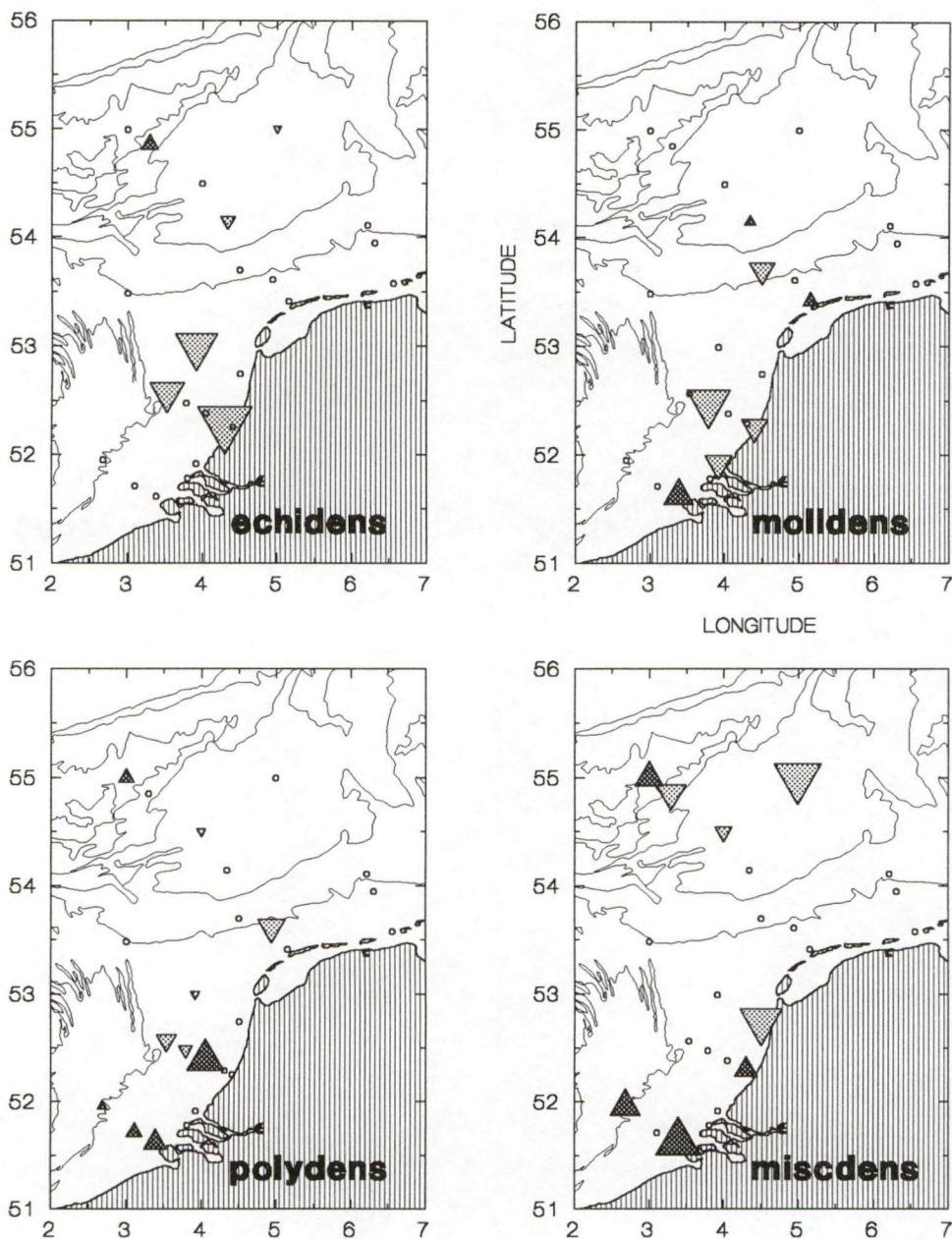


Fig. 6c. Trend-like changes in community attributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.

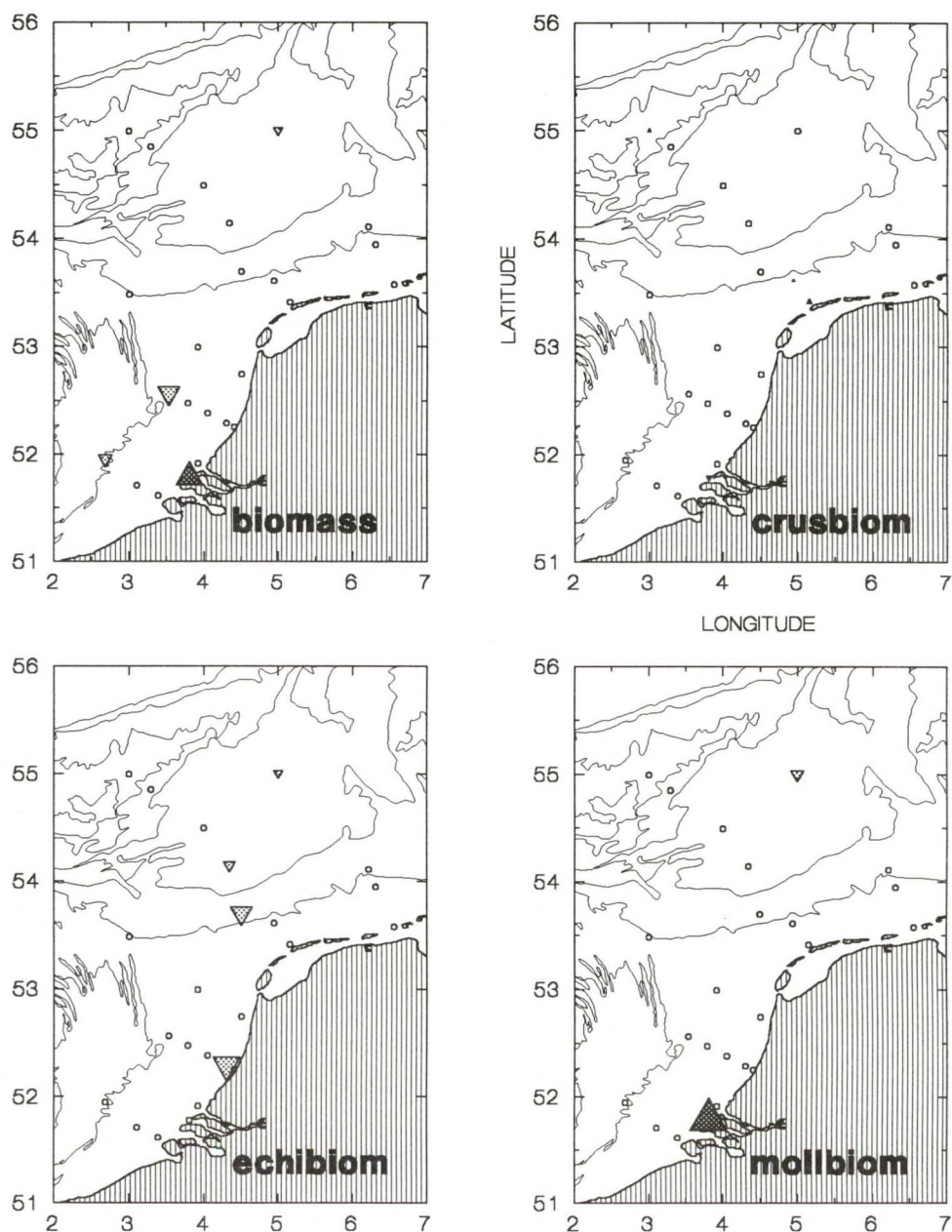


Fig. 6d. Trend-like changes in community attributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.



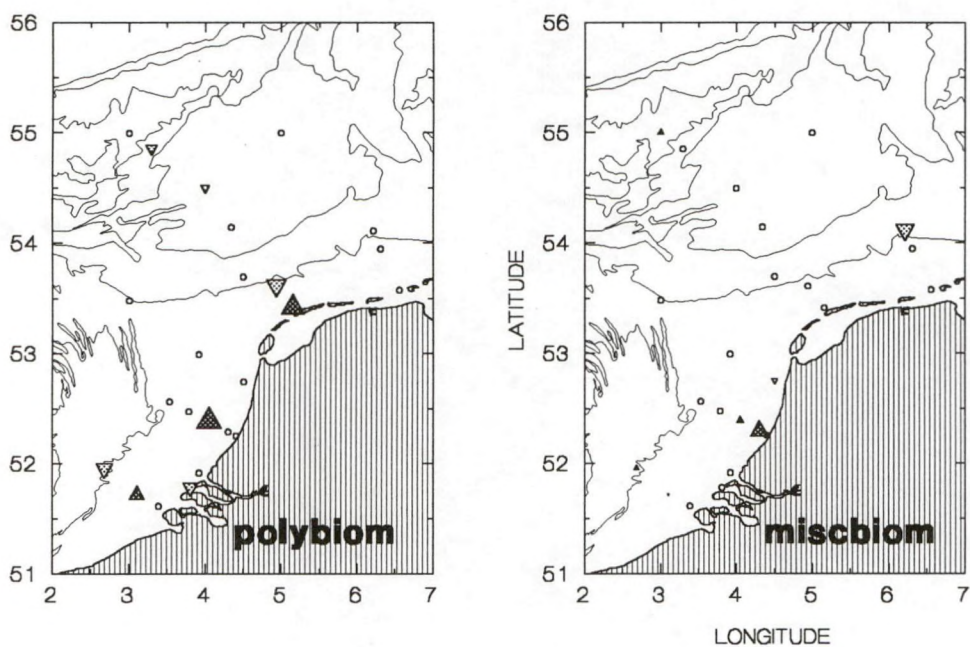


Fig. 6e. Trend-like changes in community attributes at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively an upward or downward trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant trend.

Table 5. Overview of differences and trends in production 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  |          |          |          |          |          |          |          |



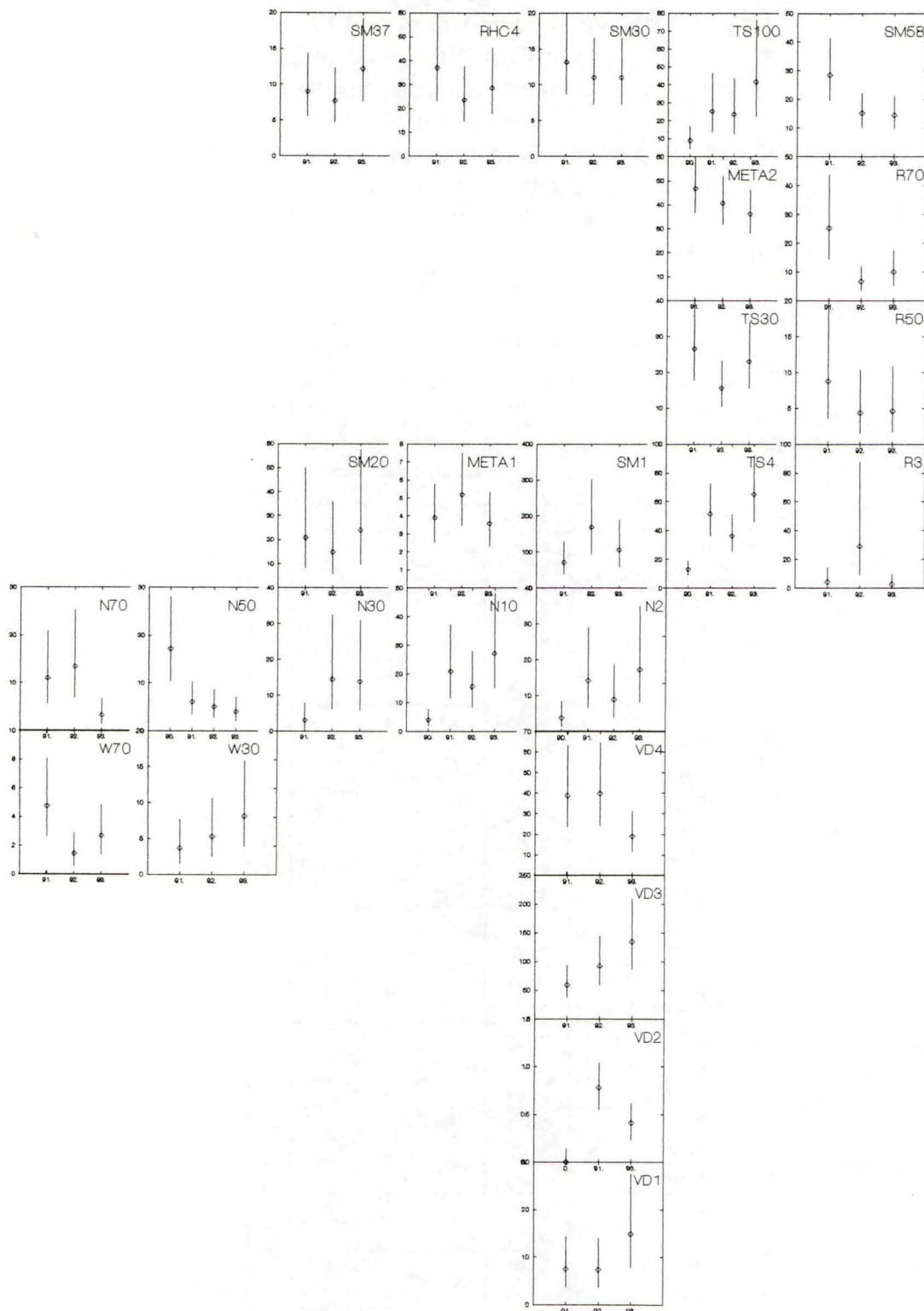


Fig. 7a. Comparison plots with the total production of the species (g.AFDW./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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

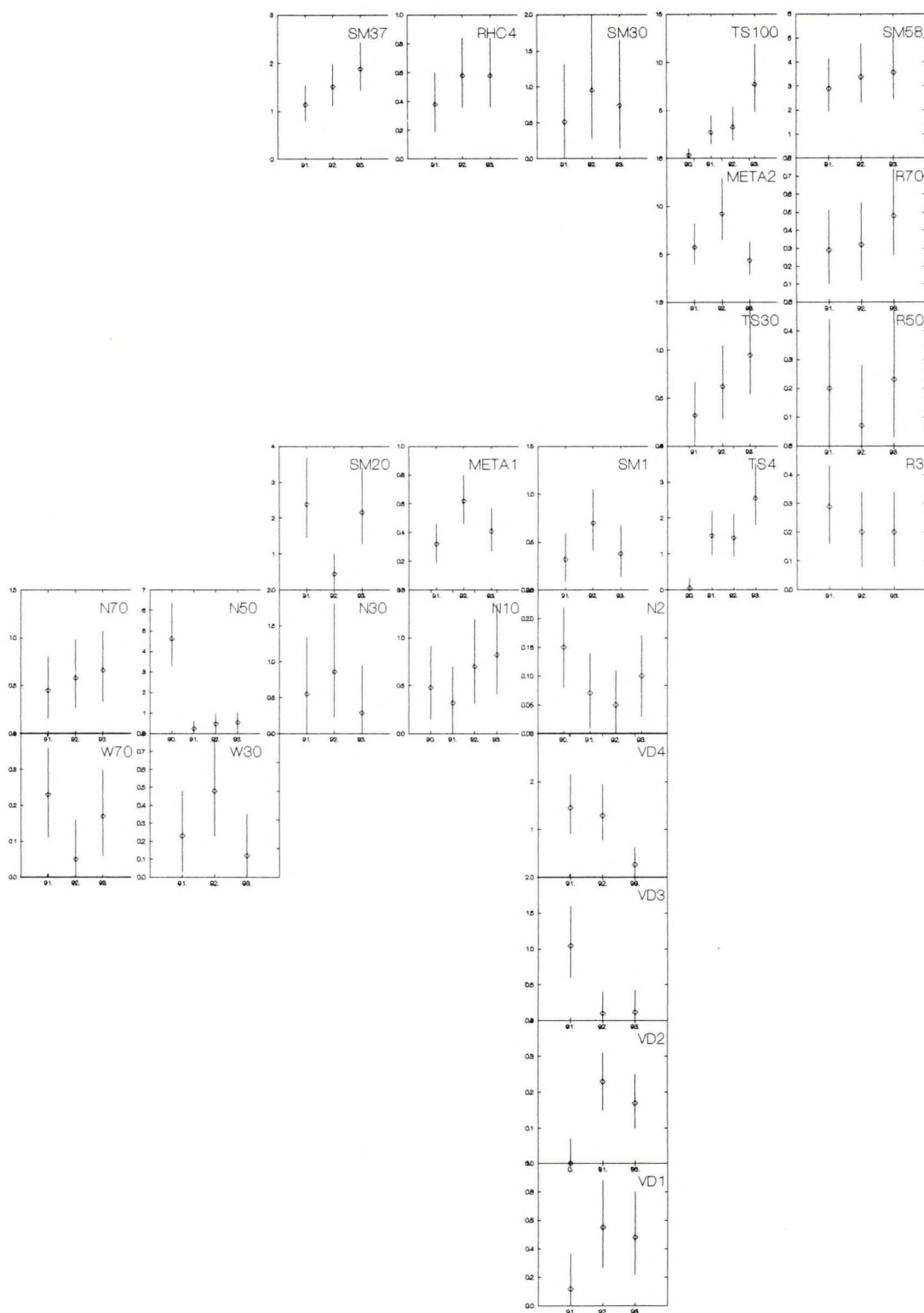


Fig. 7b. Comparison plots with the total production of the Crustaceans (g.AFDW./m²), for the period 1986-1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



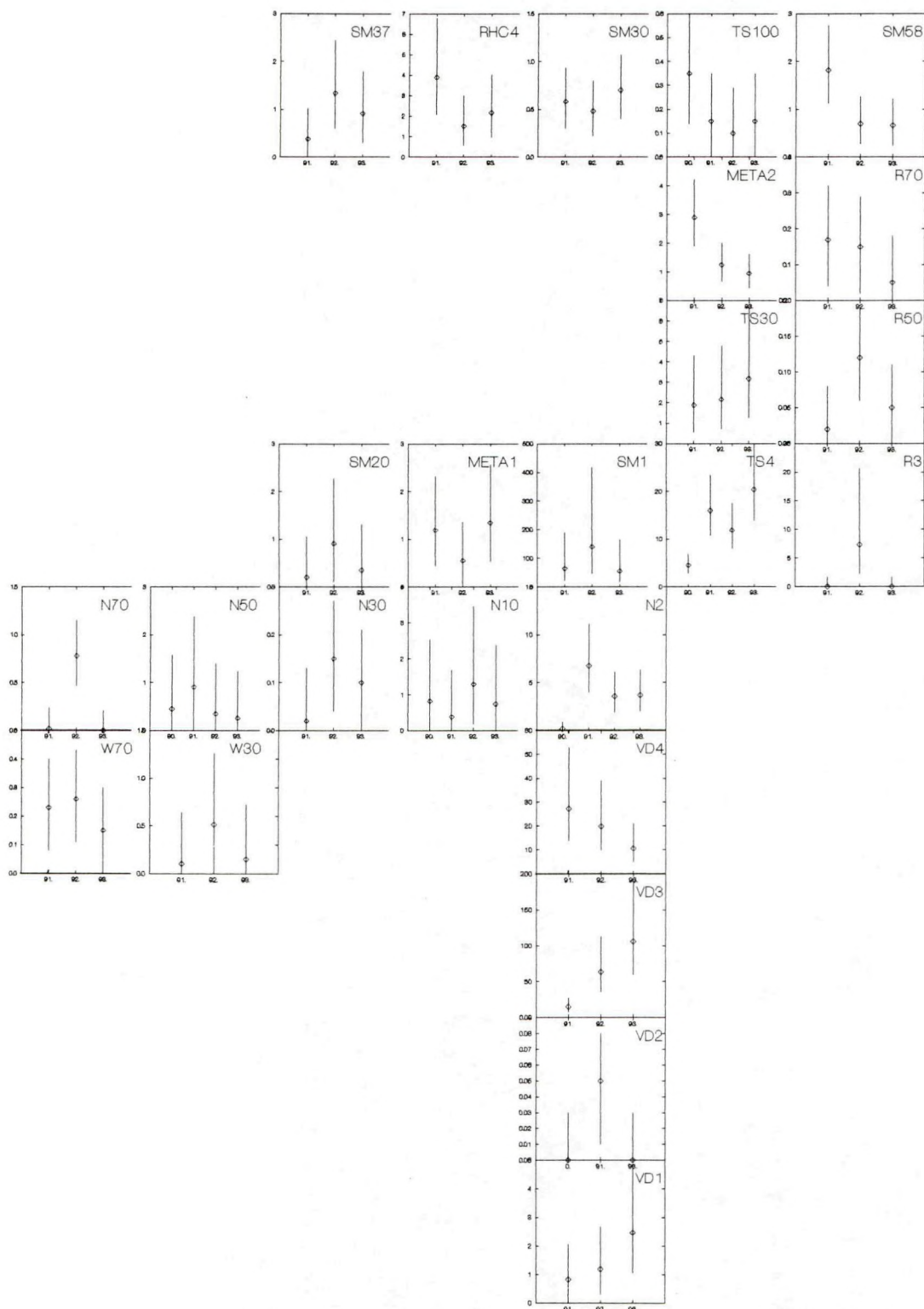


Fig. 7c. Comparison plots with the total production of the Molluscs (g.AFDW./m<sup>2</sup>), for the period 1986 - 1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding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

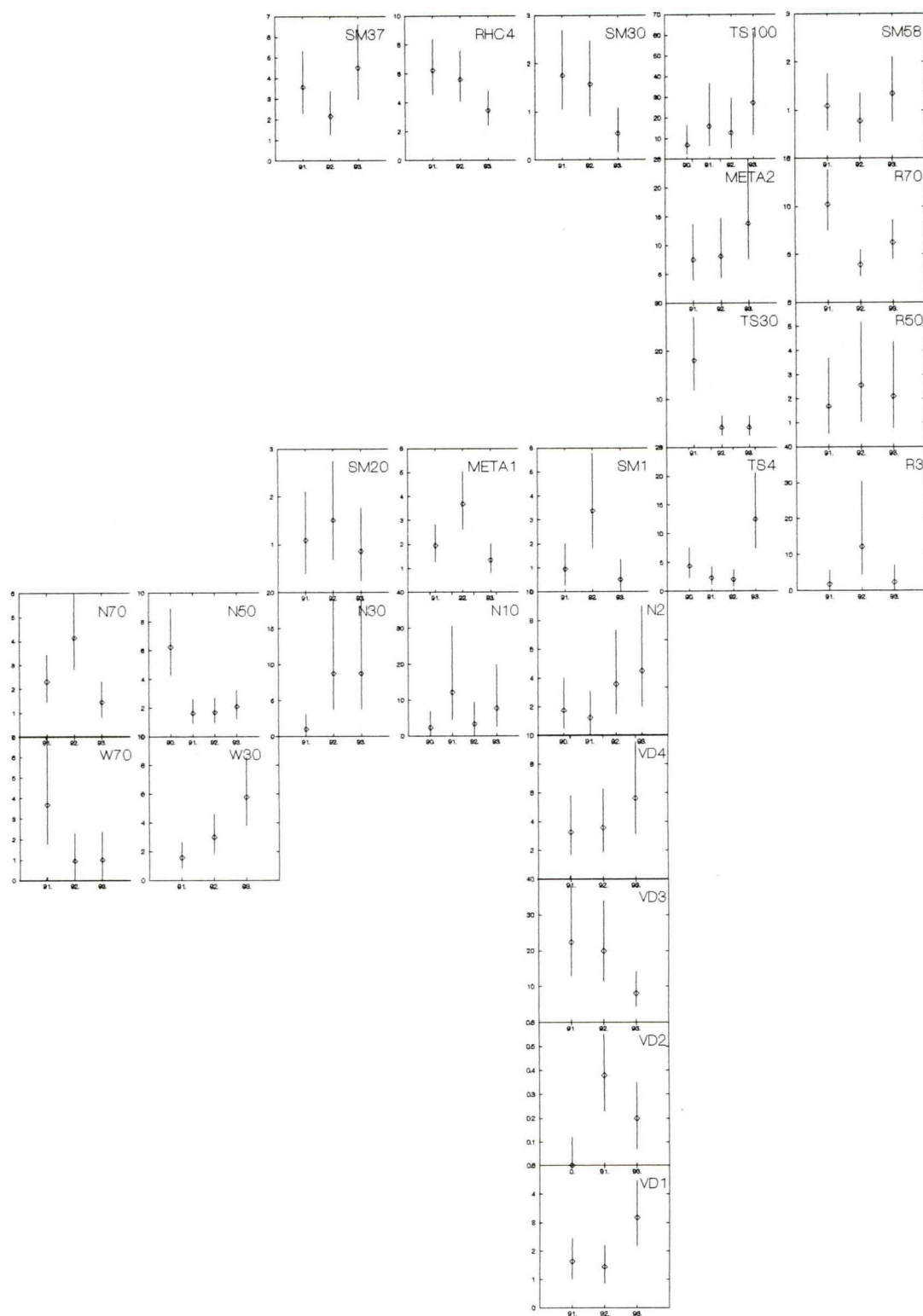


Fig. 7d. Comparison plots with the total production of the Polychaetes (g.AFDW./m²), for the period 1986-1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between the corresponding means.



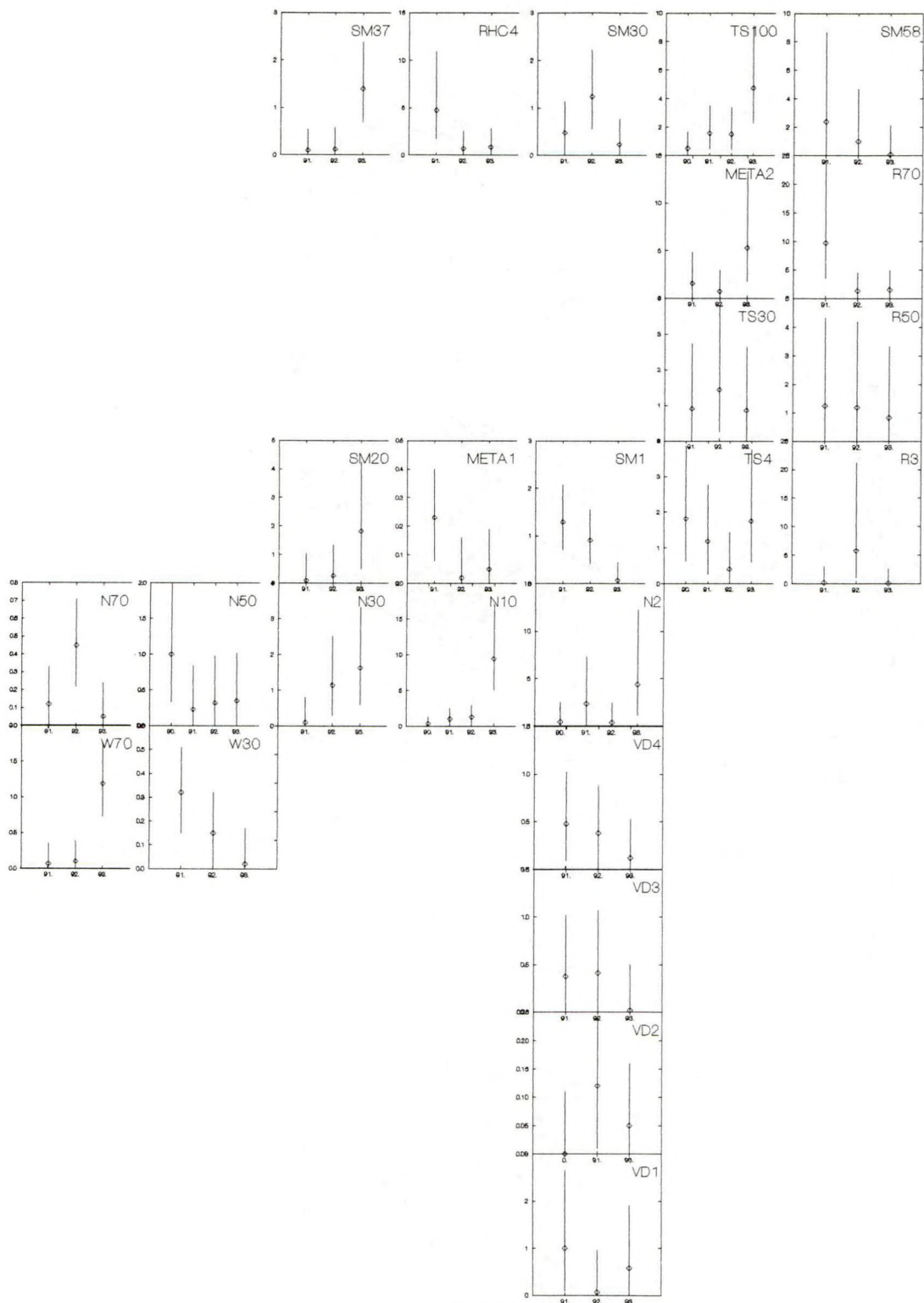


Fig. 7e. Comparison plots with the total production of the Miscellaneous species (g.AFDW./m<sup>2</sup>), for the period 1986 -1993 (Note that only part of the stations were sampled prior to 1991). The 95% comparison limits are presented as bars; non overlapping bars denote a significant difference between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

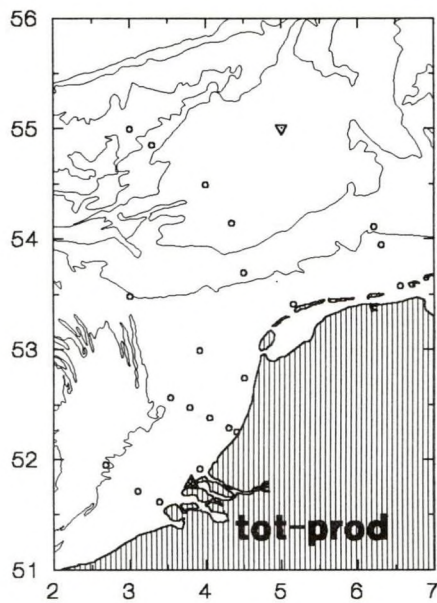


Fig. 8. Trend-like changes in total production of the species at the separate stations, during 1991-1993. The symbols ▲ and ▼ indicate respectively a increasing and decreasing trend. The size of these symbols indicates the magnitude of the regression coefficient(slope). The symbol ○ indicates no significant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

|           | R | R | R | S | T | M | T | S | R | S | M | M | S | N | N | N | N | V | V | V | V | W | W |   |
|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|           | 3 | 0 | 0 | 8 | 4 | 0 | 2 | 0 | 0 | 4 | 7 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 4 | 3 | 2 | 1 | 0 | 0 |
| ABRA ALBA | - | + | + | + | + | + | - | - | - | - | - | + | - | - | - | - | - | - | + | - | - | - | - | - |
| ABRA NITI | - | - | - | + | - | - | - | + | - | + | - | - | + | - | - | - | - | - | + | - | - | - | - | + |
| ABRA PRIS | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ACROBRAC  | + | - | + | - | - | + | - | - | - | + | + | - | - | - | - | - | + | - | - | - | - | - | - | + |
| ACTA TORN | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AMPEBREV  | - | - | - | - | - | - | - | + | - | + | + | - | + | - | + | - | - | - | - | - | - | - | - | - |
| AMPEDIAD  | - | - | - | - | - | - | - | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AMPE TENU | - | - | - | - | - | + | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AMPHIFILI | - | - | + | + | - | - | + | + | + | + | + | - | + | - | - | - | - | - | - | - | - | - | - | - |
| AMPHIURI  | - | + | - | - | - | - | - | - | - | - | + | - | + | - | + | - | - | - | - | - | - | - | - | - |
| ANAI MACU | - | - | - | - | - | - | - | - | - | + | + | - | - | + | + | + | - | - | + | - | - | - | + | + |
| ANAI MUCO | - | - | - | - | - | - | - | - | - | + | + | + | - | - | + | - | - | - | - | - | - | - | - | - |
| ANAI SUBU | - | - | - | - | - | - | - | - | - | + | + | + | - | - | + | - | - | - | - | - | - | - | - | - |
| ANTH OZOA | - | - | + | - | + | + | - | + | + | + | + | + | + | + | + | - | - | + | - | - | - | - | + | + |
| AONI PAUC | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AORI DAE  | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| APHR ACUL | - | - | - | - | - | - | - | + | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ARCT ISLA | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ARGI HAMA | - | + | + | - | - | - | - | + | + | - | + | - | + | - | - | - | - | - | - | - | - | - | - | - |
| ARIC JEFF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - |
| ARIC MINU | - | - | - | + | - | - | - | - | + | - | + | - | + | - | - | - | + | + | - | - | - | - | + | + |
| ASTA TRIA | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ATYL FALC | + | + | - | - | + | - | - | - | - | - | + | - | - | - | - | - | - | + | - | - | - | - | - | + |
| ATYL SWAM | - | - | - | - | - | - | - | - | - | - | + | + | - | - | + | + | - | + | + | - | - | - | - | + |
| BATH ELEG | + | + | + | + | + | + | - | - | - | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + |
| BATH GUIL | - | - | + | + | + | - | - | - | - | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + |
| BATH TENU | - | - | + | + | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BIVA LVIA | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BODO SCOR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - |
| BRAN LANC | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| BRIS LYRI | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CALL SUBT | - | - | + | + | - | + | + | + | + | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - |
| CALL TYRR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - |
| CAPI CAPI | - | - | - | - | + | - | - | - | - | + | + | - | - | + | + | + | - | + | + | - | - | - | - | - |
| CAPI TELL | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CAPR ELLI | - | + | + | - | - | + | - | - | - | + | - | - | - | - | - | - | - | - | + | - | - | - | - | - |
| CAUL SPEC | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CHAE SETO | - | - | + | + | - | + | + | + | + | + | + | + | + | + | + | - | - | + | - | - | - | - | - | - |
| CHAE VARI | - | - | - | - | - | + | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CING VITR | - | - | - | + | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CIRR CIRR | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CORB GIBB | - | - | + | - | - | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CORO AFFI | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CUCU ELON | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CULT PELL | - | - | - | + | - | + | - | + | + | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - |
| CUMACEA   | - | - | - | + | - | - | - | - | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CYLI CYLI | - | - | + | - | - | + | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| DEVO PERR | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| DIAS BRAD | - | - | + | + | + | + | + | + | + | + | + | - | - | + | + | - | + | - | + | - | - | - | - | - |
| DIPL GLAU | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| DONA VITT | - | - | - | - | + | + | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - |
| DOSI LUPI | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EBAL CRAN | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EBAL SPEC | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ECHI CORD | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| ECHI FLAV | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ECHI PUSI | - | + | + | - | - | - | - | - | - | - | + | - | + | - | - | - | - | - | - | - | - | - | + | + |
| ENSI DIRE | - | - | - | - | - | - | - | - | - | - | + | - | - | + | + | - | - | + | + | - | - | + | - | - |
| ENSI ENSI | - | - | - | - | - | - | - | - | - | - | + | - | + | - | - | - | + | - | - | - | - | - | - | - |
| ETEO LACT | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - |
| ETEO LONG | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + | - | - | - | + | + | + |
| EUDO DEFO | - | - | + | - | - | - | - | - | - | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - |
| EUDO TRUN | - | - | - | - | - | - | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EULI ALBA | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EUMI SANG | - | - | + | - | - | - | - | - | - | - | - | - | - | - | + | + | - | - | - | + | - | - | - | - |
| EUNI CIDA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| EXOG HEBE | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| EXOG NAID | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| EXOG SPEC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - |
| GAMM SPEC | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GARI FERV | - | - | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GATT CIRR | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GLYC ALBA | - | - | - | + | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GLYC JUV  | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GLYC LAPI | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + | - |
| GLYC NORD | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GLYC ROUX | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GOLF ELON | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GOLF PROC | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GOLF VULG | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GONI BOBR | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GONI MACU | - | + | - | - | + | - | + | + | + | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| GYPT CAPE | - | - | - | - | - | + | + | + | + | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HARM JUV  | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HARM LONG | - | - | - | - | - | - | - | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HARM LUNU | - | - | + | + | - | - | - | - | - | + | + | + | - | - | + | + | - | - | - | + | - | - | - | - |
| HARP ANTE | - | - | - | + | - | - | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HARP CREN | - | - | - | - | - | - | + | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HARP PECT | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HESI AUGE | - | + | - | - | - | - |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |



# Appendix - 1 Biomonitoring 1993

|           | R | R | R | S | T | T | M | T | S | R | S | M | M | S | N | N | N | N | V | V | V | V | W | W |
|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|           | 3 | 0 | 0 | 8 | 4 | 0 | 2 | 0 | 3 | 4 | 7 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 4 | 3 | 2 | 1 | 0 | 0 |
| HETE FILI | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HIPP DENT | - | + | + | + | - | - | - | - | - | - | + | + | - | + | + | - | - | - | - | - | - | - | - | - |
| IONE THOR | - | - | - | + | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| IPHI TRIS | - | + | + | + | + | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - |
| LANI CONC | - | - | + | + | + | - | - | - | - | - | + | + | - | - | + | + | - | - | + | + | + | + | - | - |
| LEPT INHA | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LEPT SQUA | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LEUC INCI | - | - | - | - | - | - | + | - | - | - | + | - | - | + | - | + | - | - | - | - | - | - | - | - |
| LEUC LILL | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LEUC RICH | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LUCI BORE | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LUMBLATR  | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LUMBPEU   | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MACOBALT  | + | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - |
| MACTCORA  | + | + | - | - | + | - | - | - | - | + | - | - | - | - | - | - | - | + | - | - | - | - | + | + |
| MAGEALLE  | - | - | - | + | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
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| MALDANID  | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MEDI GRAC | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MEGAAGIL  | - | + | - | - | - | + | - | - | - | - | + | - | - | - | - | + | + | + | - | - | - | - | + | + |
| MENI OBTU | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MICR MACU | - | - | - | - | - | - | - | - | - | - | - | + | - | - | + | - | - | - | - | - | - | - | - | - |
| MONTFERR  | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| MYA AREN  | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MYSEBIDE  | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| MYSI UNDA | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| NATI ALDE | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| NEMERTIN  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
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| NERE LONG | + | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| NOTO LATE | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| NUCUTENU  | - | - | - | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| NUCUTURG  | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| OLIG OCHA | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + |
| OPHE ACUM | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| OPHE LIMA | + | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| OPHI ALBI | - | - | - | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| OPHI FLEX | - | - | + | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| OPIS PTER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ORBI SPEC | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| OWENFUSI  | - | - | - | - | - | - | + | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PARA FULG | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - |
| PARA GRAC | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PECT AURI | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PECT KORE | - | - | - | + | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PERI LONG | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PETA DECL | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PHIL SPEC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PHOL MINU | - | - | + | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PHOR ONID | - | - | + | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PISI REMO | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PLAT WORM | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| POEC SERP | - | - | - | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| POLI EP   | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| POLY SPEC | - | - | - | - | - | - | + | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PONT ALTA | + | + | + | - | + | + | - | - | - | - | + | - | + | - | - | - | - | - | - | + | - | - | + | + |
| PRIO CIRR | - | - | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PROT KEFE | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PSAM MILI | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PSEU LONG | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| PSEU SIMI | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SCAL INFL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SCOL ARMI | - | - | - | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SCOL BONN | - | + | + | + | + | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SCOL SQUA | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SIGA MATH | - | - | + | + | - | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SIPH KROY | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SPHA HYST | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SPIO BOMB | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SPIO FILI | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SPIO KROY | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SPIS ELLI | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SPIS SPEC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SPIS SUBT | - | - | - | - | + | - | - | - | - | - | - | + | - | - | - | - | - | - | - | + | + | - | + | - |
| STHE LIMI | - | - | + | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| STRE WEBS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SYNC MACU | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SYNE KLAT | - | - | - | + | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| TELL FABU | - | + | + | + | + | + | - | - | - | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| TELL PYGM | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TELL SPEC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TELL TENU | + | - | - | - | + | - | - | - | - | - | - | - | - | - | + | - | - | - | - | + | + | - | - | - |
| THAR MARI | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + | - | - | - |
| THIA SCUT | + | - | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - | - | - | - | - | - | - |
| THRA CONV | - | - | - | - |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

## Appendix - 1 Biomonitoring 1993

|           | R 3 | R 5 0 | R 7 0 | S 5 8 | T 5 4 | T S 3 0 | M E T 1 A 0 | S 1 0 | S M 3 0 | R H C 4 | S M 3 7 | S M 1 1 | M E T 1 A 0 | S M 2 0 | N 2 | N 1 0 | N 3 0 | N 5 0 | N 7 0 | V D 4 | V D 3 | V D 2 | V D 1 | W 3 0 | W 7 0 |                         |
|-----------|-----|-------|-------|-------|-------|---------|-------------|-------|---------|---------|---------|---------|-------------|---------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------|
| THRA PHAS | -   | -     | +     | +     | -     | +       | -           | -     | -       | +       | +       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | THRACIA PHASEOLINA      |
| THYA FLEX | -   | -     | -     | -     | -     | -       | -           | -     | +       | +       | -       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | THYASIRA FLEXUOSA       |
| TRAV FORB | -   | -     | -     | -     | -     | -       | -           | -     | -       | -       | -       | -       | -           | -       | -   | -     | +     | +     | -     | -     | -     | -     | -     | +     | -     | TRAVISIA FORBESI        |
| TRYP SARS | -   | -     | -     | -     | -     | -       | +           | -     | -       | +       | +       | +       | +           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | TRYPHOSELLASARSI        |
| TURR COMM | -   | -     | -     | -     | -     | -       | +           | -     | -       | -       | -       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | TURITELLA COMMUNIS      |
| TYP0 LANG | -   | -     | -     | -     | -     | -       | -           | -     | -       | -       | -       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | +     | -     | TYPOSYLLIS LANGERHANSIA |
| UNCI PLAN | -   | -     | -     | -     | -     | -       | -           | -     | -       | -       | -       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | +     | -     | UNCIALA PLANIPES        |
| UPOG DELT | -   | -     | -     | -     | -     | -       | +           | +     | -       | -       | -       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | -     | +     | UPOGEBIA DELTAURA       |
| UPOG STEL | -   | -     | -     | -     | -     | -       | -           | +     | -       | -       | -       | -       | -           | -       | -   | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | UPOGEBIA STELLATA       |
| UROT BREV | -   | -     | -     | -     | -     | -       | -           | -     | -       | -       | -       | -       | -           | -       | -   | -     | -     | +     | +     | -     | -     | -     | +     | +     | -     | UROTHOEBREVICORNIS      |
| UROT POSE | -   | -     | +     | -     | +     | +       | -           | -     | -       | -       | +       | +       | +           | -       | +   | +     | +     | +     | +     | +     | +     | +     | +     | +     | -     | UROTHOEOSEIDONIS        |
| 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<sup>2</sup>  
B = Biomass in g AFDW.m<sup>2</sup>  
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:

|       |      |    |      |      |     |
|-------|------|----|------|------|-----|
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| R50   | - p. | 85 | N2   | - p. | 97  |
| R70   | - p. | 86 | N10  | - p. | 98  |
| SM58  | - p. | 87 | N30  | - p. | 98  |
| TS4   | - p. | 88 | N50  | - p. | 99  |
| TS30  | - p. | 89 | N70  | - p. | 99  |
| META2 | - p. | 90 | VD4  | - p. | 100 |
| TS100 | - p. | 91 | VD3  | - p. | 100 |
| SM30  | - p. | 92 | VD2  | - p. | 101 |
| RHC4  | - p. | 93 | VD1  | - p. | 101 |
| SM37  | - p. | 94 | W30  | - p. | 102 |
| SM1   | - p. | 95 | W70  | - p. | 103 |
| META1 | - p. | 95 |      |      |     |

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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) |
| SPIOFIL       | 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     |       |       |       |       |        |       |       |       |        |       |         |        |        |        |
| ARGHAMA       | 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) |
| HIPPIDENT     | 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) |
| EXOGLAID      | 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      |        |
| <b>CRUSTACEA</b>     |        |       |        |       |        |       |        |       |        |        |         |         |        |        |
| ARGHAMMA             | 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) |
| HIPPIDENT            | 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) |
| <b>ECHINODERMATA</b> |        |       |        |       |        |       |        |       |        |        |         |         |        |        |
| 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) |
| AMPHILI              | 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) |
| <b>MOLLUSCA</b>      |        |       |        |       |        |       |        |       |        |        |         |         |        |        |
| 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) |
| CORGBIBB             | 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) |
| CYLICLYI             | 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) |
| NATTALDE             | 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) |
| NELLFABU             | 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) |
| <b>POLYCHAETA</b>    |        |       |        |       |        |       |        |       |        |        |         |         |        |        |
| 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) |
| LARINCONC            | 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) |
| <b>MISCELLANEOUS</b> |        |       |        |       |        |       |        |       |        |        |         |         |        |        |
| 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  |        |         |         |        |        |

# Appendix - 2 Biomonitoring 1993

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  |        | 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       |        |
| <b>CRUSTACEA</b>     |        |        |        |        |        |        |        |        |        |        |         |        |         |        |
| BATHELEG             | 58.5   | 0.029  | 29.3   | 0.015  | 58.5   | 0.029  | 43.9   | 0.022  | 43.9   | 0.022  | 46.8(   | 12.2)  | 0.023(  | 0.006) |
| BATHTENU             | 190.2  | 0.095  | 278.0  | 0.139  | 117.0  | 0.059  | 14.6   | 0.007  | 14.6   | 0.007  | 122.9(  | 114.1) | 0.061(  | 0.057) |
| CALLSUBT             | 146.3  | 7.665  | 58.5   | 1.937  | 87.8   | 2.802  | 87.8   | 3.321  | 87.8   | 4.562  | 93.6(   | 32.1)  | 4.057(  | 2.229) |
| CUMACEA              | 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  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.031  | 2.9(    | 6.5)   | 0.006(  | 0.014) |
| EUDODEFO             | 204.8  | 0.102  | 131.7  | 0.066  | 58.5   | 0.029  | 58.5   | 0.029  | 102.4  | 0.051  | 111.2(  | 60.9)  | 0.056(  | 0.030) |
| HARPANTE             | 160.9  | 0.080  | 365.8  | 0.183  | 58.5   | 0.029  | 29.3   | 0.015  | 58.5   | 0.029  | 134.6(  | 138.6) | 0.067(  | 0.069) |
| HIPPIDENT            | 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) |
| IONETHOR             | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.044  | 14.6   | 0.007  | 29.3   | 0.073  | 11.7(   | 12.2)  | 0.025(  | 0.033) |
| PERILONG             | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.007  | 14.6   | 0.007  | 0.0    | 0.000  | 5.9(    | 8.0)   | 0.003(  | 0.004) |
| PSEULONG             | 43.9   | 0.022  | 14.6   | 0.007  | 0.0    | 0.000  | 29.3   | 0.015  | 14.6   | 0.007  | 20.5(   | 16.7)  | 0.010(  | 0.008) |
| PSEUSIMI             | 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) |
| <b>ECHINODERMATA</b> |        |        |        |        |        |        |        |        |        |        |         |        |         |        |
| AMPHIPLI             | 731.5  | 7.066  | 1185.0 | 9.970  | 790.0  | 7.280  | 731.5  | 8.229  | 716.9  | 7.997  | 831.0(  | 199.9) | 8.109(  | 1.147) |
| ECHICORD             | 0.0    | 0.000  | 0.0    | 0.000  | 29.3   | 10.588 | 0.0    | 0.000  | 0.0    | 0.000  | 5.9(    | 13.1)  | 2.118(  | 4.735) |
| <b>MOLLUSCA</b>      |        |        |        |        |        |        |        |        |        |        |         |        |         |        |
| ABRAALBA             | 14.6   | 0.035  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.007(  | 0.016) |
| ABRANITI             | 0.0    | 0.000  | 29.3   | 0.038  | 0.0    | 0.000  | 0.0    | 0.000  | 29.3   | 0.020  | 11.7(   | 16.0)  | 0.012(  | 0.017) |
| CINGVITR             | 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) |
| CULTPELL             | 0.0    | 0.000  | 14.6   | 0.294  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.059(  | 0.132) |
| CYLCYLI              | 0.0    | 0.000  | 73.2   | 0.076  | 102.4  | 0.064  | 43.9   | 0.053  | 29.3   | 0.048  | 49.7(   | 39.5)  | 0.048(  | 0.029) |
| MONTFERR             | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.006  | 0.0    | 0.000  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.001(  | 0.003) |
| MYSEBIDE             | 599.8  | 0.057  | 1623.9 | 0.222  | 936.3  | 0.135  | 892.4  | 0.098  | 1316.7 | 0.167  | 1073.8( | 399.4) | 0.136(  | 0.063) |
| NATIALDE             | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.010  | 14.6   | 0.102  | 5.9(    | 8.0)   | 0.023(  | 0.045) |
| NUCUTENU             | 131.7  | 0.037  | 175.6  | 0.050  | 29.3   | 0.004  | 73.2   | 0.023  | 43.9   | 0.016  | 90.7(   | 61.6)  | 0.026(  | 0.018) |
| NUCUTURG             | 14.6   | 0.200  | 29.3   | 0.069  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 8.8(    | 13.1)  | 0.054(  | 0.087) |
| TELLFABU             | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.000  | 14.6   | 0.028  | 5.9(    | 8.0)   | 0.006(  | 0.012) |
| THRAPHAS             | 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) |
| VENUSTRI             | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.003  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.001(  | 0.001) |
| <b>POLYCHAETA</b>    |        |        |        |        |        |        |        |        |        |        |         |        |         |        |
| ARICMINU             | 14.6   | 0.000  | 14.6   | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 5.9(    | 8.0)   | 0.000(  | 0.000) |
| CHAESETO             | 58.5   | 0.012  | 58.5   | 0.010  | 29.3   | 0.019  | 0.0    | 0.000  | 0.0    | 0.000  | 29.3(   | 29.3)  | 0.008(  | 0.008) |
| GLYCALBA             | 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) |
| LANICONC             | 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) |
| MAGEALLE             | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.132  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.026(  | 0.059) |
| MAGEPAPI             | 131.7  | 0.022  | 58.5   | 0.007  | 58.5   | 0.016  | 117.0  | 0.019  | 146.3  | 0.038  | 102.4(  | 41.4)  | 0.020(  | 0.011) |
| NEPHCAEC             | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 1.110  | 14.6   | 1.441  | 0.0    | 0.000  | 5.9(    | 8.0)   | 0.510(  | 0.708) |
| NEPHHOMB             | 58.5   | 0.578  | 58.5   | 0.294  | 14.6   | 0.230  | 14.6   | 0.279  | 14.6   | 0.010  | 32.2(   | 24.0)  | 0.278(  | 0.203) |
| OPHIFLEX             | 29.3   | 0.053  | 29.3   | 0.047  | 0.0    | 0.000  | 14.6   | 0.016  | 14.6   | 0.007  | 17.6(   | 12.2)  | 0.025(  | 0.024) |
| PHOLMINU             | 278.0  | 0.070  | 380.4  | 0.078  | 204.8  | 0.048  | 43.9   | 0.006  | 102.4  | 0.025  | 201.9(  | 134.6) | 0.045(  | 0.030) |
| POECSERP             | 14.6   | 0.018  | 0.0    | 0.000  | 14.6   | 0.048  | 0.0    | 0.000  | 29.3   | 0.022  | 11.7(   | 12.2)  | 0.018(  | 0.020) |
| PRIOCIRR             | 0.0    | 0.000  | 131.7  | 0.007  | 29.3   | 0.006  | 0.0    | 0.000  | 0.0    | 0.000  | 32.2(   | 57.0)  | 0.003(  | 0.004) |
| SCOLARMI             | 29.3   | 0.059  | 14.6   | 0.042  | 14.6   | 0.029  | 0.0    | 0.000  | 0.0    | 0.000  | 11.7(   | 12.2)  | 0.026(  | 0.026) |
| SCOLBONN             | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 14.6   | 0.054  | 2.9(    | 6.5)   | 0.011(  | 0.024) |
| SIGAMATH             | 0.0    | 0.000  | 14.6   | 0.029  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.006(  | 0.013) |
| SPIOBOMB             | 29.3   | 0.006  | 58.5   | 0.004  | 58.5   | 0.010  | 29.3   | 0.004  | 87.8   | 0.007  | 52.7(   | 24.5)  | 0.006(  | 0.002) |
| SPIOFILI             | 58.5   | 0.012  | 14.6   | 0.004  | 0.0    | 0.000  | 73.2   | 0.031  | 43.9   | 0.004  | 38.0(   | 30.3)  | 0.010(  | 0.012) |
| STHELIMI             | 0.0    | 0.000  | 14.6   | 0.023  | 0.0    | 0.000  | 0.0    | 0.000  | 0.0    | 0.000  | 2.9(    | 6.5)   | 0.005(  | 0.010) |
| SYNEKLAT             | 204.8  | 0.031  | 102.4  | 0.016  | 131.7  | 0.031  | 102.4  | 0.013  | 117.0  | 0.018  | 131.7(  | 42.7)  | 0.022(  | 0.008) |
| <b>MISCELLANEOUS</b> |        |        |        |        |        |        |        |        |        |        |         |        |         |        |
| NEMERTIN             | 0.0    | 0.000  | 0.0    | 0.000  | 29.3   | 0.102  | 0.0    | 0.000  | 14.6   | 0.010  | 8.8(    | 13.1)  | 0.023(  | 0.045) |
| PHORONID             | 14.6   | 0.006  | 0.0    | 0.000  | 58.5   | 0.023  | 0.0    | 0.000  | 14.6   | 0.006  | 17.6(   | 24.0)  | 0.007(  | 0.010) |
| 5                    | 3247.9 | 16.269 | 5003.5 | 13.637 | 2984.5 | 22.750 | 2516.4 | 13.789 | 3204.0 | 13.386 | 3391.2( | 946.8) | 15.966( | 3.966) |
| 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  |        |         |        |         |        |



# 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      | N       | B       |
| <b>CRUSTACEA</b>     |        |        |        |        |        |       |        |        |        |        |         |        |         |         |
| 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)  |
| <b>ECHINODERMATA</b> |        |        |        |        |        |       |        |        |        |        |         |        |         |         |
| 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)  |
| <b>MOLLUSCA</b>      |        |        |        |        |        |       |        |        |        |        |         |        |         |         |
| 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)  |
| <b>POLYCHAETA</b>    |        |        |        |        |        |       |        |        |        |        |         |        |         |         |
| 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)  |
| <b>MISCELLANEOUS</b> |        |        |        |        |        |       |        |        |        |        |         |        |         |         |
| 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       |         |
| <b>CRUSTACEA</b>     |        |        |        |        |        |        |        |        |        |        |         |         |         |         |
| 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)  |
| HARPECT              | 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)  |
| UPOGDEL              | 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)  |
| <b>ECHINODERMATA</b> |        |        |        |        |        |        |        |        |        |        |         |         |         |         |
| AMPHILI              | 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)  |
| <b>MOLLUSCA</b>      |        |        |        |        |        |        |        |        |        |        |         |         |         |         |
| 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)  |
| CYLCIYLI             | 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)  |
| LEPTSUUA             | 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)  |
| <b>POLYCHAETA</b>    |        |        |        |        |        |        |        |        |        |        |         |         |         |         |
| 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)  |
| GATTICIRR            | 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)  |
| LUMBPEU              | 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)  |
| <b>MISCELLANEOUS</b> |        |        |        |        |        |        |        |        |        |        |         |         |         |         |
| 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  |        |         |         |         |         |

# Appendix - 2 Biomonitoring 1993

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       |         |
| <b>CRUSTACEA</b>     |        |        |        |        |        |        |        |        |        |         |         |        |         |         |
| 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)  |
| LEUCILL              | 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)  |
| UPOGDEL              | 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) |
| UPOGDEL              | 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)  |
| <b>ECHINODERMATA</b> |        |        |        |        |        |        |        |        |        |         |         |        |         |         |
| AMPHILI              | 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)  |
| <b>MOLLUSCA</b>      |        |        |        |        |        |        |        |        |        |         |         |        |         |         |
| ABRANIT              | 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)  |
| CYLCIYLI             | 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)  |
| LEPTUA               | 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)  |
| <b>POLYCHAETA</b>    |        |        |        |        |        |        |        |        |        |         |         |        |         |         |
| 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)  |
| EXOGEHEB             | 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)  |
| LUMBPSIU             | 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)  |
| STHELI               | 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)  |
| <b>MISCELLANEOUS</b> |        |        |        |        |        |        |        |        |        |         |         |        |         |         |
| 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)  |
| GOLFEVULG            | 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)  |
| S                    | 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       |        |
| <b>CRUSTACEA</b>     |        |        |        |       |        |        |        |       |        |        |         |        |         |        |
| 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) |
| <b>ECHINODERMATA</b> |        |        |        |       |        |        |        |       |        |        |         |        |         |        |
| AMPHILI              | 1682.3 | 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(    |        | 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) |
| <b>MOLLUSCA</b>      |        |        |        |       |        |        |        |       |        |        |         |        |         |        |
| ARTISLA              | 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) |
| CORGBIBB             | 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) |
| <b>POLYCHAETA</b>    |        |        |        |       |        |        |        |       |        |        |         |        |         |        |
| 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) |
| DIPGLAU              | 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) |
| EXOHEBE              | 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) |
| <b>MISCELLANEOUS</b> |        |        |        |       |        |        |        |       |        |        |         |        |         |        |
| 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) |
| 5                    | 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       |         |
| <b>CRUSTACEA</b>     |        |        |        |        |        |        |        |        |        |        |         |        |         |         |
| 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)  |
| HIPPIDENT            | 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)  |
| TRYPARS              | 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)  |
| <b>ECHINODERMATA</b> |        |        |        |        |        |        |        |        |        |        |         |        |         |         |
| 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)  |
| AMPHIFILI            | 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)  |
| <b>MOLLUSCA</b>      |        |        |        |        |        |        |        |        |        |        |         |        |         |         |
| 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)  |
| ANAISSUBU            | 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)  |
| <b>POLYCHAETA</b>    |        |        |        |        |        |        |        |        |        |        |         |        |         |         |
| 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)  |
| DIPGLAU              | 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)  |
| SPIOFILU             | 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)  |
| <b>MISCELLANEOUS</b> |        |        |        |        |        |        |        |        |        |        |         |        |         |         |
| 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  |        |         |        |         |         |



# Appendix - 2 Biomonitoring 1993

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      |        |
| <b>CRUSTACEA</b>     |        |        |        |        |        |       |        |       |        |       |         |        |        |        |
| 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) |
| HIPPIDENT            | 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) |
| <b>ECHINODERMATA</b> |        |        |        |        |        |       |        |       |        |       |         |        |        |        |
| 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) |
| <b>MOLLUSCA</b>      |        |        |        |        |        |       |        |       |        |       |         |        |        |        |
| 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) |
| CYCLICYLI            | 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)  | 1.05(  | 1.145) |
| 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) |
| <b>POLYCHAETA</b>    |        |        |        |        |        |       |        |       |        |       |         |        |        |        |
| 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) |
| ANAIASUB             | 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) |
| SCOLSUA              | 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 | 702.3(  | 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) |
| <b>MISCELLANEOUS</b> |        |        |        |        |        |       |        |       |        |       |         |        |        |        |
| 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  |       |         |        |        |        |

# Appendix - 2 Biomonitoring 1993

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        |          |
| <b>CRUSTACEA</b>     |       |        |        |         |        |         |        |         |        |         |         |         |          |          |
| 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)   |
| <b>ECHINODERMATA</b> |       |        |        |         |        |         |        |         |        |         |         |         |          |          |
| 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)  |
| <b>MOLLUSCA</b>      |       |        |        |         |        |         |        |         |        |         |         |         |          |          |
| 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)   |
| <b>POLYCHAETA</b>    |       |        |        |         |        |         |        |         |        |         |         |         |          |          |
| 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)   |
| ANAIUBU              | 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)   |
| <b>MISCELLANEOUS</b> |       |        |        |         |        |         |        |         |        |         |         |         |          |          |
| 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      |        |
| <b>CRUSTACEA</b>     |       |       |       |        |       |       |       |       |       |       |        |       |        |        |
| 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) |
| HIPPIDENT            | 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) |
| <b>ECHINODERMATA</b> |       |       |       |        |       |       |       |       |       |       |        |       |        |        |
| 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) |
| <b>MOLLUSCA</b>      |       |       |       |        |       |       |       |       |       |       |        |       |        |        |
| 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) |
| <b>POLYCHAETA</b>    |       |       |       |        |       |       |       |       |       |       |        |       |        |        |
| ARICMINO             | 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) |
| <b>MISCELLANEOUS</b> |       |       |       |        |       |       |       |       |       |       |        |       |        |        |
| 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       |        |
| <b>CRUSTACEA</b>     |       |        |       |        |       |        |       |        |       |        |        |        |         |        |
| 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) |
| <b>ECHINODERMATA</b> |       |        |       |        |       |        |       |        |       |        |        |        |         |        |
| 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) |
| <b>MOLLUSCA</b>      |       |        |       |        |       |        |       |        |       |        |        |        |         |        |
| 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) |
| <b>POLYCHAETA</b>    |       |        |       |        |       |        |       |        |       |        |        |        |         |        |
| 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) |
| <b>MISCELLANEOUS</b> |       |        |       |        |       |        |       |        |       |        |        |        |         |        |
| 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       |         |
| <u>CRUSTACEA</u>     |       |        |        |        |        |        |       |       |        |        |        |        |         |         |
| 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)  |
| <u>ECHINODERMATA</u> |       |        |        |        |        |        |       |       |        |        |        |        |         |         |
| 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)  |
| <u>MOLLUSCA</u>      |       |        |        |        |        |        |       |       |        |        |        |        |         |         |
| 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)  |
| <u>POLYCHAETA</u>    |       |        |        |        |        |        |       |       |        |        |        |        |         |         |
| 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)  |
| <u>MISCELLANEOUS</u> |       |        |        |        |        |        |       |       |        |        |        |        |         |         |
| 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)  |
| NERPHOMB      | 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  | 102.4 | 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) |
| ANASUBU       | 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  |       |         |        |        |        |

# Appendix - 2 Biomonitoring 1993

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      |        |
| <u>CRUSTACEA</u>     |       |       |       |       |       |        |       |       |       |       |        |        |        |        |
| 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) |
| UROTBBREV            | 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) |
| <u>ECHINODERMATA</u> |       |       |       |       |       |        |       |       |       |       |        |        |        |        |
| 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) |
| <u>MOLLUSCA</u>      |       |       |       |       |       |        |       |       |       |       |        |        |        |        |
| 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) |
| <u>POLYCHAETA</u>    |       |       |       |       |       |        |       |       |       |       |        |        |        |        |
| 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) |
| ETEOLECT             | 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) |
| SCOLSUA              | 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) |
| <u>MISCELLANEOUS</u> |       |       |       |       |       |        |       |       |       |       |        |        |        |        |
| 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) |
| OLIGOCHIA            | 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      |        |
| <u>CRUSTACEA</u>     |        |       |       |        |       |       |       |       |       |       |        |        |        |        |
| 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) |
| UROTBBREV            | 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) |
| <u>ECHINODERMATA</u> |        |       |       |        |       |       |       |       |       |       |        |        |        |        |
| 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) |
| <u>POLYCHAETA</u>    |        |       |       |        |       |       |       |       |       |       |        |        |        |        |
| 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) |
| SCOLSUA              | 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) |
| <u>MISCELLANEOUS</u> |        |       |       |        |       |       |       |       |       |       |        |        |        |        |
| 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     |        |        |        |        |        |        |        |        |       |        |         |        |         |         |
| ATYLPALC      | 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      |        |        |        |        |        |        |        |        |       |        |         |        |         |         |
| ABRANIT       | 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)  |
| OPHALBI       | 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  |         |         |        |          |          |

# Appendix - 2 Biomonitoring 1993

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) |
| UROTREV       | 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)  |
| UROTREV       | 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 |        |         |        |         |         |



# Appendix - 2 Biomonitoring 1993

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 |        | 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  | 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)  |
| UROTREV       | 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)  |
| OPHALBI       | 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      |       |        |        |        |       |       |        |       |        |       |         |        |         |         |
| MACTICORA     | 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)  |
| SPIOFILJ      | 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          |       |        | 20     |        | 13    |       | 15     |       | 11     |       |         |        |         |         |
| SH-W          | 2.250 |        | 1.847  |        | 2.287 |       | 2.037  |       | 1.402  |       |         |        |         |         |
| STMP          | 0.150 |        | 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      |        |
| <b>CRUSTACEA</b>     |        |       |        |       |       |       |       |       |        |       |         |        |        |        |
| 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) |
| <b>ECHINODERMATA</b> |        |       |        |       |       |       |       |       |        |       |         |        |        |        |
| 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) |
| ECHIPIUSI            | 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) |
| <b>MOLLUSCA</b>      |        |       |        |       |       |       |       |       |        |       |         |        |        |        |
| 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) |
| <b>POLYCHAETA</b>    |        |       |        |       |       |       |       |       |        |       |         |        |        |        |
| 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) |
| ETEOLOG              | 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) |
| EXOGENAID            | 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) |
| OPIPTER              | 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) |
| SCOLSUA              | 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) |
| <b>MISCELLANEOUS</b> |        |       |        |       |       |       |       |       |        |       |         |        |        |        |
| 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  |       |         |        |        |        |



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