

Appendix 5C

Hong Kong Offshore Windfarm in Southeastern Waters

Provision of Services for Marine Benthic Infauna Study

Final Report

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List of Abbreviations

ABC	Abundance and Biomass Comparison
d	Species richness
GPS	Global Positioning System
H'	Species diversity
H ₂ O ₂	Hydrogen peroxide
J	Evenness
K _G	Kurtosis
MD	Median diameter
MDS	Multi-dimensional scaling
PCA	Principal component analysis
PC	Principal component
PRIMER	Plymouth Routine in Multivariate Ecological Research
QA/QC	Quality assurance/quality control
QD	Quartile deviation
Sk	Inclusive graphic skewness
TOM	Total organic matter
UK	United Kingdom
W	W statistic
σ	Inclusive graphic standard deviation
ϕ	phi unit

1 INTRODUCTION

1.1 Introduction

The present study is part of the EIA for the proposed project “Hong Kong Offshore Windfarm in Southeastern Waters” and aims to:

- Update baseline information on general benthic infauna community in southeastern waters of Hong Kong, including the Study Area of the proposed Offshore Windfarm, and
- Identify presence (if any) of *Amphioxus* and/or other ecologically important species or habitats in the vicinity of the Study Area.

1.3 Structure of the Report

This Final Report details the study carried out and results collected from the wet and dry seasons in August 2006 and January 2007. An analysis of the data collected in the sampling areas is also presented.

The Report is organized into 5 sections:

Section 1 Introduction.

Section 2 describes methodology used in the benthic survey.

Section 3 details results collected from the survey.

Section 4 presents an analysis of the sediment and faunal data collected.

Section 5 References.

There are 3 annexes with this report. Annex 1 presents the data on sediment particle size and total organic matter (TOM) analyses. Annex 2 lists the species list and data on individuals and biomass recorded for the sampling stations. Annex 3 presents the plots on abundance and biomass comparison (ABC) of the faunal data.

2 SURVEY METHODOLOGY

2.1 Field Sampling

The wet season survey was undertaken in August 2006 whereas the dry season survey was conducted in January 2007, at 8 sampling stations as proposed in the Method Statement for Benthic Infauna Survey. The co-ordinates for the 8 stations are listed in Table 1 and their locations are depicted in Figure 1. The co-ordinates of one of the station B3 differs from the originally proposed, since the location is apparently on hard ground and no samples could be collected during the wet season field trip. It was decided on the field trip in August 2006 that station B3 was moved slightly westward along the proposed cable route. The same co-ordinates were followed for the dry season survey in January 2007.

Table 1. Co-ordinates of sampling stations

Station	Latitude	Longitude
B1	22° 15.808' N	114° 16.266' E
B2	22° 14.040' N	114° 17.962' E
B3	22° 14.557' N	114° 21.016' E
B4	22° 15.296' N	114° 24.678' E
B5	22° 16.622' N	114° 25.146' E
B6	22° 17.978' N	114° 25.482' E
B7	22° 16.987' N	114° 23.679' E
B8	22° 15.928' N	114° 25.969' E

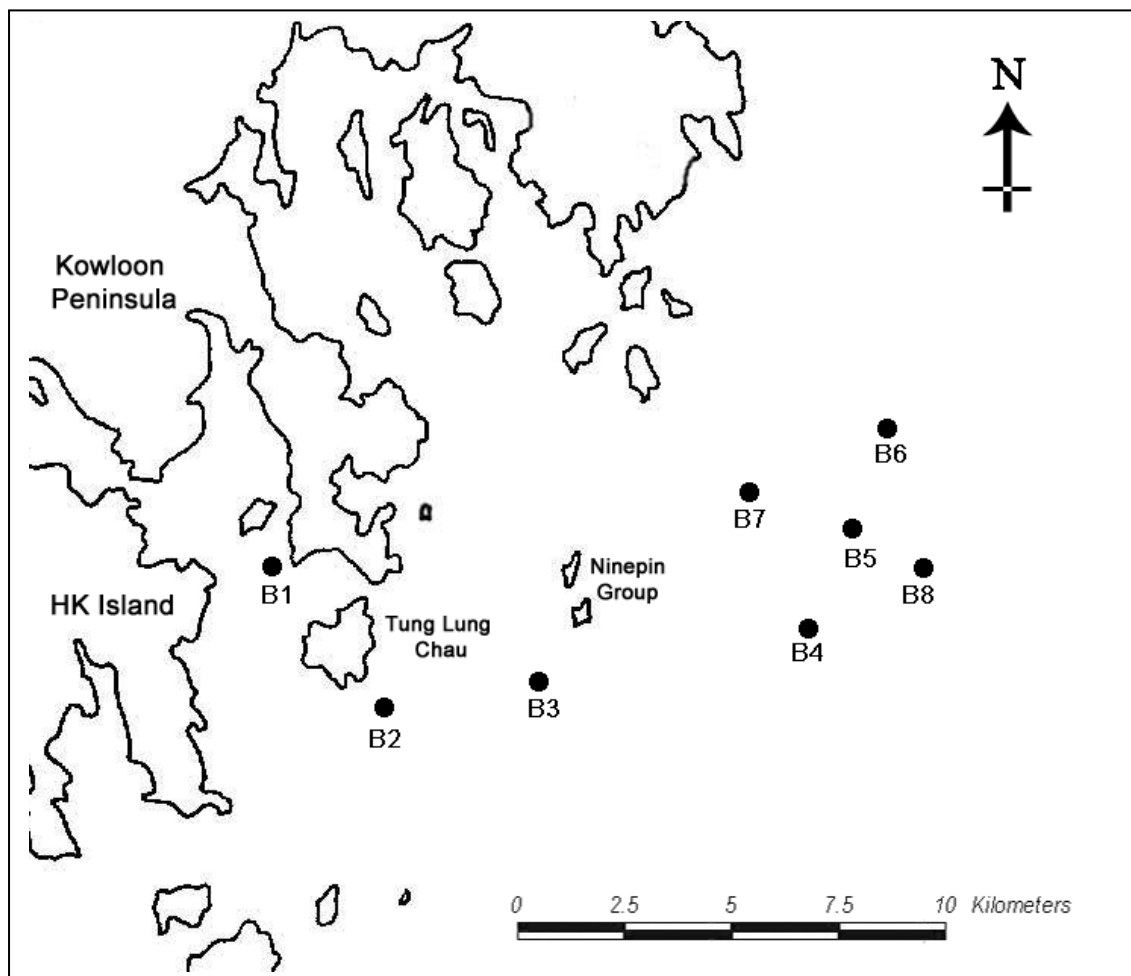


Figure 1. Infauna sampling stations

The following sampling strategy was applied to both surveys. At each station, 5 replicate sediment samples using a 0.1 m² van Veen Grab were collected for faunal analysis. In addition, one extra sample was taken for particle size distribution and total organic matter (TOM) analyses. As the Method Statement requires that the 6 sampling points (replicates) shall be no closer than 50 m apart so as to increase the survey area, the following sampling procedure was adopted. At each location, 6 sampling points were fixed by Global Positioning System (GPS) on board. A centre point at the co-ordinates of that station was first determined. Additionally 5 sampling points radiating from this centre point at equal-degree angle (72°) and 50 m away were determined. Of these 6 sampling points, the sequence of the replicates for faunal or sediment analysis was randomized by drawing lots. Water depth at each station was measured with echo sounding.

Each grab sample, once collected, was inspected to ensure that the volume of sediment obtained was not less than 2 L and that there were no signs of uneven penetration by the buckets of the grab during lowering into the sediment surface. A photographic record of the colour of the sediment surface at each station was taken prior to processing of the samples. For faunal analysis, the sediment sample was washed with gentle seawater through a stack of top 1.0 and bottom 0.5 mm sieves. Large animals that were visible from the residues were hand-picked into a small plastic vial. All remains were then washed and transferred into a plastic container and preserved with 5% borax-buffered formalin and stained with 1% Rose Bengal. Sediment samples for total organic matter analysis were stored in an icebox on board the vessel before being transferred to a freezer at -20°C in the laboratory.

2.2 Laboratory Work

Sorting of all residues remaining on the 0.5 mm sieve was carried out in the laboratory of City University of Hong Kong by trained technicians prior to taxonomic identification and biomass (wet weight) determination. To achieve the lowest taxonomic resolution, examination of the morphological features of the collected specimens was undertaken with the aid of both stereoscopic and compound microscopes. To record the number of individuals, only the anterior portions of the animals were counted. Total biomass of the benthic animals at each sampling location was determined as preserved wet weight, after blotting the animals on filter paper for three minutes before weighing to the nearest 0.01 g.

Determination of sediment particle size distribution and TOM was carried out in the laboratory at City University of Hong Kong. Particle size analysis was carried out by the wet sieving method through a stack of sieves from 2000 to 63 µm, as follows: granule (>2000 µm), very coarse sand (2000-1000 µm), coarse sand (1000-500 µm), medium sand (500-250 µm), fine sand (250-125 µm), very fine sand (125-63 µm), and silt-clay (<63 µm). Particle size determination was carried out for one replicate per sampling station according to the Method Statement.

For TOM analysis, all sediment samples were pre-treated with 35% hydrogen peroxide (H₂O₂) overnight to remove calcium carbonate. The percent TOM was calculated as the loss in weight of sediment after combustion at 500°C for 8 hours, as compared with samples dried at 100°C. Two replicates of TOM determination per sediment sample were undertaken.

2.3 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) measures were instituted in ensuring the accuracy and reliability of the data obtained in the present study. These included supervision of all field sampling activities by qualified and experienced technicians. To ensure that animals from residues of all samples were sorted out for later identification, 10% of the sorted samples were randomly re-checked prior to being identified, counted and weighed. 10% of the specimens identified were also randomly re-checked for taxonomic identity, so as to ensure consistency in the species identification process. In processing all faunal samples in both surveys, no animals were missed during the sorting and identification stages.

2.4 Data Preparation and Analyses

All data were stored in MS EXCEL format and input into the PRIMER program version 6 (Plymouth Marine Laboratory, UK) for subsequent statistical analyses.

Sediment particle size parameters (i.e., median diameter ($MD\phi$), quartile deviation ($QD\phi$), inclusive graphic standard deviation (σ), inclusive graphic skewness ($Sk\phi$) and kurtosis (K_G)) were calculated by best fitting an equation to the particle size distribution curve of each sediment sample using MS EXCEL or SPSS (Statistical Package for Social Sciences), to obtain the different ϕ values ($\phi = -\log_2$ (particle size in mm)) at selected % frequencies.

$MD\phi$ measures the average size of the sediment particle. A negative ϕ value corresponds to coarser sediments (gravel) whereas a positive ϕ value corresponds to finer sediments (+1 ϕ = coarse sand, +2 ϕ = medium sand, +3 ϕ = fine sand, +4 ϕ = very fine sand, +8 ϕ = silt, >+8 ϕ = clay).

$QD\phi$ measures the number of ϕ units lying between the first and third quartile diameters (i.e., between the 25% and 75% points on the cumulative curve of the particle size distribution plot). Sediment with a small spread between the quartiles is regarded as being “well sorted” (i.e., well mixed between different types of particles). Another parameter that examines the sorting nature of the sediment is σ , which utilizes a wider spread between the 5% to 95% points on the cumulative curve. The following scale (from Buchanan, 1984) classifies the meaning of sorting into:

< 0.35 ϕ	very well sorted
0.35 ϕ - 0.50 ϕ	well sorted
0.50 ϕ - 0.71 ϕ	moderately well sorted
0.71 ϕ - 1.00 ϕ	moderately sorted
1.00 ϕ - 2.00 ϕ	poorly sorted
2.00 ϕ - 4.00 ϕ	very poorly sorted
>4.00 ϕ	extremely poorly sorted

$Sk\phi$ measures the symmetry of the spread in the cumulative curve of the particle distribution plot. If there is a tendency for the data to spread on one side more than the other, this asymmetry is referred to skewness. A positive $Sk\phi$ indicates that the mean of the quartiles lies on the right of the $MD\phi$ while a negative $Sk\phi$ would lie to the left of the $MD\phi$. The following scale (from Buchanan, 1984) classifies the meaning of skewness into:

+1.00 ϕ - +0.30 ϕ	strongly fine skewed
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+0.30 ϕ - +0.10 ϕ	fine skewed
+0.10 ϕ - -0.10 ϕ	symmetrical
-0.10 ϕ - -0.30 ϕ	coarse skewed
-0.30 ϕ - -1.00 ϕ	strongly coarse skewed

K_G measures the departure from normal distribution in the cumulative curve of the particle size distribution plot. If the central portion of the frequency distribution is excessively peaked, the curve is termed leptokurtic, whereas if the curve is flat peaked, it is platykurtic. The following scale (from Buchanan, 1984) classifies the meaning of graphic kurtosis into:

<0.67 ϕ	very platykurtic
0.67 ϕ - 0.90 ϕ	platykurtic
0.90 ϕ - 1.11 ϕ	mesokurtic (nearly normal)
1.11 ϕ - 1.50 ϕ	leptokurtic
1.50 ϕ - 3.00 ϕ	very leptokurtic

In addition to calculation of different sediment particle size parameters, Principal Component Analysis (PCA) was employed in delineating the spatial pattern among the sampling stations. PCA is a multivariate statistical technique using the correlations among the data (variables) to develop a small set of components (Principal Components, PC) that empirically summarizes the correlations among the variables (i.e., sediment particle size parameters). Prior to PCA, the sediment data were screened using correlation plots between pairs of sediment parameters. Parameters with significant correlations were excluded in subsequent PCA.

For faunal data, the following biological statistics were calculated for the 5-pooled replicates per station, including species richness (d), diversity (H') and evenness (J). Details of the formulation of these statistics are as follows:

Species Richness (d) = $(s - 1) / \ln N$ (Margalef 1958)

Species Diversity (H') = $-\sum_{i=1}^s (N_i/N) \ln (N_i/N)$ (Shannon and Weaver, 1963)

Species Evenness (J) = $H' / \ln s$ (Pielou, 1966)

where s = total number of species; N = total number of individuals; N_i = number of individuals of the i^{th} species.

Species richness, d , measures the number of species in a given habitat, biotope, community or assemblage in relation to individual number, whereas species diversity, H' , measures the variety of species in a community taking into account the number and relative abundance of species. Species evenness, J , examines how similar species and abundance is within a community and varies between 0 (low evenness, i.e., few species dominate in terms of abundance) to 1 (high evenness, i.e., all species have equal abundance).

For delineation of spatial patterns (if any) of benthic assemblages at the 8 stations, multivariate statistical analyses were applied to the wet season data sets. Both cluster and non-metric Multi-Dimensional Scaling (MDS) analysis were employed in analysis of faunal data obtained. Cluster analysis is a computer-sorting technique to join sampling stations that

have similar faunal composition into a form of dendrogram (tree-like diagram), whereas MDS is an ordination method in which the variance of the faunal data is decomposed into derived factors and groupings of the sampling stations are produced along the axes of these factors. The significance of the grouping of stations formed in cluster analysis was examined by the ‘similarity profile’ (SIMPROF) permutation tests and the species representing the groupings were analyzed by ‘similarity percentage’ (SIMPER) procedure of PRIMER (Clarke and Gorley, 2006). The “stress value” of a MDS plot is to indicate how reliable the grouping of stations is. A “stress value” of <0.05 gives an excellent representation whereas a value of <0.1 corresponds to a good ordination of the station groupings (Clarke and Warwick, 2001). Prior to subjecting the data set for cluster/MDS analyses, the faunal data were transformed and similarity index calculated. In the present analysis, a square-root transformation was used to reduce the skewed influence of individual high abundance numbers in the data set and the Bray-Curtis similarity index (Bray and Curtis, 1957) was used.

Correlation between the station groups delineated from the cluster and MDS methods and sediment parameters was further analyzed using the ‘biotic to environmental’ (BIO-ENV) procedure from the PRIMER software (Plymouth Marine Laboratory, UK) on the species-abundance and sediment datasets. BIO-ENV is to link biota to multivariate environmental patterns by matching the ordination plots (such as MDS plot) of biotic (e.g., species-abundance) and abiotic data (e.g., sediment parameters) through the calculation of rank correlation between the two sets of data (Clarke and Warwick, 2001).

The status of community disturbance was also assessed using the abundance/biomass comparison (ABC) method (Warwick, 1986; Warwick and Clarke, 1994). This method is based on the ecological theory that under stable unpolluted (environmentally undisturbed) conditions, where the benthic community is approaching equilibrium, the biomass will become increasingly dominated by one or a few large species, each represented by rather few individuals, which are in equilibrium with the available resources. In polluted (environmentally disturbed) conditions, the reverse occurs. Plots of the relative proportions of biomass and numbers attributable to each species, in which the species were ranked in order of importance on the x-axis (logarithmic scale) with percentage dominance on the y-axis (cumulative scale), were graphed, and the *W* statistic (Clarke, 1990) was computed for each sampling station. *W* measures the extent to which the biomass curve lies above the abundance curve. A positive *W* indicates ‘undisturbed’ conditions, whereas a negative *W* reflects ‘disturbed’ conditions.

For seasonal comparison, sediment parameters were analyzed using PCA whereas benthic community structure at the sampling stations were delineated using both cluster and MDS analyses. For univariate parameters, paired sample *t*-test was used to discern difference between the wet and dry season survey results.

3 RESULTS

3.1 Sediment Characteristics

Table 2 lists the mean TOM content and particle size parameters analyzed from the sediment samples at the 8 stations, together with water depth measured at the time of sampling, for both wet and dry season surveys. Details of the data and the graphic plots of the sediment particle size distribution as well as the photographic records of the sediment can be referred to Annex 1.

Table 2. Water depth, TOM and particle size data in wet and dry season surveys

Season	Station	Depth (m)	Mean TOM (%)	MD ϕ	QD ϕ	σ	Sk ϕ	K _G
Wet (Aug. 2006)	B1	16	6.78	6.19	1.15	1.48	-0.20	0.81
	B2	31	2.43	5.39	1.70	2.38	-0.29	0.93
	B3	32	3.69	3.31	2.46	3.02	-0.04	0.74
	B4	31	5.36	6.14	1.18	1.53	-0.21	0.81
	B5	32	4.84	6.20	1.14	1.47	-0.20	0.80
	B6	27	5.31	6.18	1.15	1.48	-0.20	0.81
	B7	30.5	6.55	6.21	1.13	1.46	-0.20	0.80
	B8	30	4.98	6.12	1.18	1.54	-0.21	0.81
Dry (Jan. 2007)	B1	18	7.70	6.02	1.26	1.65	-0.22	0.82
	B2	28	2.73	3.19	2.75	3.42	-0.11	0.75
	B3	29	4.43	5.55	1.57	2.13	-0.26	0.87
	B4	27	6.44	6.21	1.13	1.46	-0.20	0.80
	B5	27	7.40	6.20	1.14	1.47	-0.20	0.80
	B6	27	7.13	6.20	1.14	1.47	-0.20	0.80
	B7	28	7.18	6.23	1.12	1.45	-0.20	0.80
	B8	28	5.20	6.16	1.16	1.51	-0.20	0.81

In the wet season survey, the depth of sampling stations ranged from 16 (station B1) to 32 m (stations B3, B5). The mean TOM content ranged from 2.43% (station B2) to 6.78% (station B1). On average, the TOM content of marine sediments at these 8 stations was 4.99%. In the dry season survey, the depth of sampling stations ranged from 18 (station B1) to 29 m (station B3). The mean TOM content ranged from 2.73% (station B2) to 7.70% (station B1). On average, the TOM content of marine sediments at these 8 stations was 6.03%. Statistically, the mean TOM at the sampling stations in the dry season was significantly higher than that in the wet season (paired *t*-test, $p < 0.01$).

Table 2 also shows the particle size statistics at the 8 stations. In the wet season survey, the MD ϕ showed a range from 3.31 ϕ (station B3) to 6.21 ϕ (stations B7). Only the sediment at station B3 had MD ϕ less than 4 ϕ , indicating that the sediment at this station was composed of coarser materials. All other stations had MD ϕ over 5 ϕ , indicating that these stations were composed mostly of very fine sand and silt/clay. The QD ϕ ranged from 1.13 ϕ (station B7) to 2.46 ϕ (station B3), whereas the σ ranged from 1.46 ϕ (station B7) to 3.02 ϕ (station B3). Thus, sediments at all the stations were poorly sorted, except for stations B2 and B3, which were very poorly sorted. The Sk ϕ ranged from -0.04 ϕ (station B3) to -0.29 ϕ (station B2). Sediments at all stations were coarse skewed (i.e., the coarse fraction was under-represented) in their cumulative distribution (see plots in Annex 1). The K_G varied from 0.74 ϕ (station B3) to 0.87 ϕ (station B3). Sediments at all stations were classified as platykurtic (i.e., a flat peak in the frequency distribution of particle size classes), except for station B2, which was

regarded as mesokurtic (i.e., nearly normal “bell” shape in the frequency distribution of particle size classes).

In the dry season survey, the MD ϕ showed a range from 3.19 ϕ (station B2) to 6.23 ϕ (stations B7). Only the sediment at station B2 had MD ϕ less than 4 ϕ , indicating that the sediment at this station was composed of coarser materials. All other stations had MD ϕ over 5 ϕ , indicating that these stations were composed mostly of very fine sand and silt/clay. The QD ϕ ranged from 1.12 ϕ (station B7) to 2.75 ϕ (station B2), whereas the σ ranged from 1.45 ϕ (station B7) to 3.42 ϕ (station B2). Thus, sediments at all the stations were poorly sorted, except for stations B2 and B3, which were very poorly sorted. The Sk ϕ ranged from -0.11 ϕ (station B2) to -0.26 ϕ (station B3). Sediments at all stations were coarse skewed (i.e., the coarse fraction was under-represented) in their cumulative distribution (see plots in Annex 1). The K_G varied from 0.75 ϕ (station B2) to 0.87 ϕ (station B3). Sediments at all stations were also classified as platykurtic.

When comparing the sediment particle size characteristics, varying values were obtained at stations B2 and B3 in the wet and dry season survey. This suggested that these two stations could be on heterogeneous sediments. However, results of *t*-test showed no statistical differences for all the particle size parameters between the wet and dry season surveys.

Sediment samples collected at all stations in both wet and dry season surveys showed pale grey in colour and did not emit pungent smell.

3.2 Faunal Composition

The wet season survey produced a total of 1,498 specimens with 92 species in 8 phyla. This included 1 species of nemertean, 51 annelids (polychaetes), 1 sipunculan, 9 molluscs (8 bivalves, 1 gastropod), 20 arthropods (crustaceans), 1 phoronid, 3 echinoderms, 1 cephalochordate and 5 osteichthyes (fish). A complete list of the species recorded is shown in the species list in Annex 2. Polychaete annelids, crustaceans and bivalves were by far the most abundant animal groups collected, comprising 55.4%, 21.7% and 9.8% of the total species respectively.

The dry season survey produced a total of 1,856 specimens with 85 species in 9 phyla. This included 1 species of nemertean, 49 annelids (polychaetes), 1 sipunculan, 1 echiuran, 8 molluscs (bivalves), 19 arthropods (crustaceans), 1 phoronid, 2 echinoderms, and 3 osteichthyes (fish). A complete list of the species recorded is shown in the species list in Annex 2. Polychaete annelids, crustaceans and bivalves were by far the most abundant animal groups collected, comprising 57.6%, 22.4% and 9.4% of the total species respectively.

From both surveys, 3,354 specimens and 107 species in 9 phyla were recorded. This included 1 species of nemertean, 55 annelids (polychaetes), 1 sipunculan, 1 echiuran, 13 molluscs (12 bivalves, 1 gastropod), 25 arthropods (crustaceans), 1 phoronid, 3 echinoderms, 1 cephalochordate and 6 osteichthyes (fish). A complete list of the species recorded is also shown in the species list in Annex 2. Of these species, 71 (66.3%) were recorded in both surveys, 22 (20.6%) were only recorded in the wet and 14 (13.1%) in the dry season survey. Polychaete annelids, crustaceans and bivalves were by far the most abundant animal groups collected, comprising 55.4%, 21.7% and 9.8% of the total species respectively.

Table 3 summarizes the number of species and individuals, and biomass obtained at each sampling station both in the wet and dry season surveys. In the wet season survey, species number recorded (0.5 m^{-2}) varied from 18 (station B1) to 46 (station B2), whereas individual number ranged from 264 (station B4) to 546 m^{-2} (station B3). For biomass (wet weight) determination, the lowest record was at station B1 with a total of 1.77 g and highest at station B2 with a total of 39.83 g m^{-2} . On average, there were 33.5 species, $374.5 \text{ individuals m}^{-2}$ and 11.86 g m^{-2} per station. The detailed data on species and biomass per sampling station are also appended in Annex 2. In the dry season survey, species number recorded (0.5 m^{-2}) varied from 14 (station B1) to 53 (station B3), whereas individual number ranged from 40 (station B1) to 378 m^{-2} (station B3). For biomass (wet weight) determination, the lowest record was at station B1 with a total of 0.27 g and highest at station B3 with a total of 19.55 g m^{-2} . On average, there were 27.6 species, $232.0 \text{ individuals m}^{-2}$ and 8.21 g m^{-2} per station. The detailed data on species and biomass per sampling station are also appended in Annex 2.

When comparing the species, individual and biomass data between the wet and dry season surveys, significantly higher individual numbers were recorded at sampling stations in the wet than that in the dry season (t -test, $p < 0.05$).

Table 3. Summary of species, individuals and biomass recorded at each station in wet and dry season surveys

Season	Station	No. of species (0.5 m^{-2})	No. of individuals (m^{-2})	Wet weight (g m^{-2})
Wet (Aug. 2006)	B1	18	468	1.77
	B2	46	538	39.83
	B3	41	546	7.38
	B4	34	264	16.99
	B5	37	326	4.80
	B6	29	296	4.98
	B7	31	276	7.35
	B8	32	282	11.79
Dry (Jan. 2007)	B1	14	40	0.27
	B2	46	332	8.37
	B3	53	378	19.55
	B4	19	182	2.69
	B5	26	288	15.65
	B6	24	196	3.68
	B7	17	204	1.69
	B8	22	236	13.79

Table 4 lists 28 species which occurred $\geq 50\%$ of the 8 sampling stations, with their mean number and biomass in the wet season survey. The most common, ubiquitous species were the sipunculan *Apionsoma trichocephalus* and nemertean species which occurred at all 8 stations, followed by the polychaetes *Magelona* sp., *Aglaophamus dibranchis* and crustacean (ghost shrimp) *Callianassa japonica* which occurred at 7 out of 8 sampling stations. The mean densities and biomass of these species at these stations ranged from 3.0 to 60.0 m^{-2} and 0.01 to 0.38 g m^{-2} , respectively.

Table 5 lists 20 species which occurred $\geq 50\%$ of the 8 sampling stations, with their mean number and biomass in the dry season survey. The most common, ubiquitous species were the sipunculan *Apionsoma trichocephalus*, crustaceans *Callianassa japonica* and amphipod species, and nemertean species which occurred at all 8 stations, followed by the polychaetes *Aglaophamus dibranchis* and *Cossurella dimorpha*, and echinoderm (brittle starfish) *Amphiura hexactis* which occurred at 7 of the 8 sampling stations. The mean densities and biomass of these species at these stations ranged from 2.5 to 76.0 m^{-2} and 0.01 to 1.23 g m^{-2} , respectively.

Table 6 summarizes the 20 species which occurred $\geq 50\%$ of the 8 sampling stations in both wet and dry season surveys. Only 2 species were common (100% occurrence) in both surveys, including the sipunculan *Apionsoma trichocephalus* and nemertean species, followed by the crustacean (ghost shrimp) *Callianassa japonica* (93.8% occurrence) and the polychaete *Aglaophamus dibranchis* and crustacean amphipod species (87.5% occurrence). The mean densities and biomass of these species at these stations ranged from 3.0 to 68.0 m^{-2} and 0.01 to 0.77 g m^{-2} , respectively.

3.3 Species with High Conservation Value

In the wet season survey, the cephalochordate (amphioxus) *Branchiostoma belcheri* is of particular importance in terms of high conservation value. *B. belcheri* has been an important fishery resource in coastal waters of South China Sea, especially near Xiamen (Lu et al., 1998), and is classified as a second priority protection species in China (Huang, 2006). *B. belcheri* was recorded at stations B2 and B3. At station B2, 3 individuals were collected in the 5-pooled grab samples whereas at B3, 32 were collected. The body length of these specimens ranged from 5.5 to 7 mm, with a mean of 6.1 mm. Based on our unpublished data on the biology of *B. belcheri* in Hong Kong, this body length was estimated at less than half year of age and considered juveniles as the life span of *B. belcheri* is about 2.5-3 years.

In the dry season survey, however, there were no records of *B. belcheri* from all the sampling stations.

Table 4. The most common occurring species in wet season survey

Group	Species	% occurrence (of 8 stations)	Mean density (no. m ⁻²)	Mean biomass (g m ⁻²)
S	<i>Apionsoma trichocephalus</i>	100	60.0	0.14
N	Nemertean spp.	100	18.5	0.07
P	<i>Magelona</i> sp.	87.5	4.9	0.02
P	<i>Aglaophamus dibranchis</i>	87.5	17.1	0.05
C	<i>Callianassa japonica</i>	87.5	9.1	0.16
P	<i>Tharyx</i> sp.	75	21.3	0.06
P	<i>Cossurella dimorpha</i>	75	6.0	0.02
P	<i>Paralacydonia paradox</i>	75	4.7	0.01
Ph	<i>Phoronis</i> sp.	75	12.0	0.01
E	<i>Amphiura hexactis</i>	75	3.0	0.02
C	<i>Typhlocarcinops canaliculata</i>	75	3.0	0.17
C	Amphipod spp.	75	4.7	0.01
F	<i>Bregmaceros macclellandi</i>	75	3.0	0.03
P	<i>Mediomastus</i> sp.	62.5	7.2	0.01
P	<i>Cirriformia</i> sp.	62.5	10.4	0.38
P	<i>Lumbrineris shiinoi</i>	62.5	4.4	0.02
P	<i>Aglaophamus sinensis</i>	62.5	4.8	0.05
P	<i>Sigambra hanaokai</i>	62.5	3.6	0.01
P	<i>Prionospio saccifera</i>	62.5	5.2	0.01
P	<i>Sternaspis scutata</i>	62.5	4.4	0.34
P	<i>Loimia bandera</i>	62.5	7.6	0.08
C	Copepod spp.	62.5	36.8	0.01
P	<i>Anobothrus</i> sp.	50	3.0	0.01
P	<i>Paraprionospio pinnata</i>	50	4.5	0.01
P	<i>Rhynchospio</i> sp.	50	12.5	0.04
C	<i>Alpheus brevicristatus</i>	50	3.0	0.04
C	<i>Leptochela aculeocaudata</i>	50	3.0	0.06
F	<i>Odontamblyopus</i> sp.	50	3.5	0.30

F = Fish, C = Crustacea, N = Nemertea, P = Polychaeta, Ph = Phoronida, S = Sipuncula

Table 5. The most common occurring species in dry season survey

Group	Species	% occurrence (of 8 stations)	Mean density (no. m ⁻²)	Mean biomass (g m ⁻²)
S	<i>Apionsoma trichocephalus</i>	100	76.0	0.15
C	<i>Callianassa japonica</i>	100	14.5	0.12
C	Amphipod spp.	100	12.3	0.01
N	Nemertean spp.	100	10.5	0.12
P	<i>Aglaophamus dibranchis</i>	87.5	8.3	0.01
E	<i>Amphiura hexactis</i>	87.5	4.3	0.02
P	<i>Cossurella dimorpha</i>	87.5	4.3	0.03
P	<i>Magelona</i> sp.	75	5.3	0.03
P	<i>Lumbrineris nagae</i>	75	3.0	0.24
P	<i>Glycera chirori</i>	62.5	11.6	0.58
P	<i>Tharyx</i> sp.	62.5	7.2	0.01
C	<i>Xenophthalmus pinnotheroides</i>	62.5	6.8	0.95
P	<i>Mediomastus</i> sp.	62.5	3.2	0.13
P	<i>Sternaspis sculata</i>	62.5	2.8	0.02
P	<i>Leonnates persica</i>	50	5.5	0.02
P	<i>Laonice cirrata</i>	50	4.0	0.24
P	<i>Prionospio saccifera</i>	50	4.0	0.02
P	<i>Loimia bandera</i>	50	3.5	0.29
F	<i>Odontamblyopus</i> sp.	50	3.0	1.23
P	<i>Phylo ornatus</i>	50	2.5	0.01

E = Echinodermata, F = Fish, C = Crustacea, N = Nemertea, P = Polychaeta, S = Sipuncula

Table 6. The most common occurring species in wet and dry season surveys

Group	Species	% occurrence (of 8 stations in 2 seasons)	Mean density (no. m ⁻²)	Mean biomass (g m ⁻²)
S	<i>Apionsoma trichocephalus</i>	100	68.0	0.15
N	Nemertean spp.	100	14.5	0.10
C	<i>Callianassa japonica</i>	93.8	12.0	0.14
P	<i>Aglaophamus dibranchis</i>	87.5	12.7	0.03
C	Amphipod spp.	87.5	9.0	0.01
P	<i>Cossurella dimorpha</i>	81.3	5.1	0.03
P	<i>Magelona</i> sp.	81.3	5.1	0.02
E	<i>Amphiura hexactis</i>	81.3	3.7	0.02
P	<i>Tharyx</i> sp.	68.8	14.9	0.04
P	<i>Mediomastus</i> sp.	62.5	5.2	0.07
P	<i>Sternaspis sculata</i>	62.5	3.6	0.18
P	<i>Loimia bandera</i>	56.3	5.8	0.18
P	<i>Prionospio saccifera</i>	56.3	4.7	0.01
P	<i>Paralacydonia paradox</i>	56.3	4.7	0.01
P	<i>Lumbrineris nagae</i>	56.3	2.9	0.18
Ph	<i>Phoronis</i> sp.	50	10.0	0.01
P	<i>Lumbrineris shiinoi</i>	50	4.0	0.02
P	<i>Sigambra hanaokai</i>	50	3.3	0.01
F	<i>Odontamblyopus</i> sp.	50	3.3	0.77
C	<i>Typhlocarcinops canaliculata</i>	50	3.0	0.39

F = Fish, C = Crustacea, E = Echinodermata, N = Nemertea, P = Polychaeta, Ph = Phoronida, S = Sipuncula

4 ANALYSIS OF SURVEY DATA

4.1 Environmental Parameters

In this study, the major environmental parameters analyzed included sediment particle size distribution and total organic matter (TOM). In total, 7 parameters were extracted from the depth and sediment data (Table 2). Of these, the quartile deviation (QD ϕ) and inclusive graphic standard deviation (σ) are closely related to each other, as QD ϕ measures the number of ϕ units lying between the first and third quartile diameters (i.e., between the 25% and 75% points on the cumulative curve of the particle size distribution plot) whereas σ measures the sorting nature of the sediment, based on a wider spread between the 5% to 95% points on the cumulative curve. This was confirmed by the correlation plots between pairs of sediment parameters, in which the data points of QD ϕ and σ fell closely into a straight line (correlation coefficient = 0.99) for both the wet and dry season surveys. By excluding QD ϕ , a dataset of 6 sediment parameters was subjected to PCA.

Table 7 shows the results of PCA whereas Figure 2 is a 2-D plot of the PCA results based on the first two Principal Components (PC1 and PC2) of the wet season survey data. According to the coefficients of the variables from PCA (Table 7), stations with positive scores along PC1 had high mean MD ϕ and TOM values, whereas stations with positive scores along PC2 had high TOM and Sk ϕ values. It is apparent that total organic matter, median diameter and skewness of the particle size distribution of the sediments were important parameters to differentiate the sampling stations in the survey. Six of the sampling stations (B1, B4-B8) tended to group closer than the remaining 2 stations B2 and B3. These 6 stations had higher MD ϕ and TOM values. Station B2 had lower TOM, whereas station B3 had lower MD ϕ and TOM levels.

Table 7. Results of PCA on water depth and sediment data in wet season survey

	PC1	PC2	PC3	PC4
Eigen value	3.13	2.03	0.77	0.07
% variation	52.1	33.9	12.8	1.2
Cumulative % variation	52.1	86.0	98.8	100.0
Coefficients in the linear combinations of variables making up PC's)				
Depth	-0.281	-0.277	-0.879	-0.268
Mean TOM	0.369	0.510	-0.042	-0.776
Median diameter (MD ϕ)	0.551	-0.049	-0.234	0.233
Inclusive graphic SD (σ)	-0.528	-0.139	0.322	-0.359
Inclusive graphic skewness (Sk ϕ)	-0.413	0.478	-0.053	0.102
Graphic kurtosis (K _G)	0.180	-0.642	0.255	-0.364

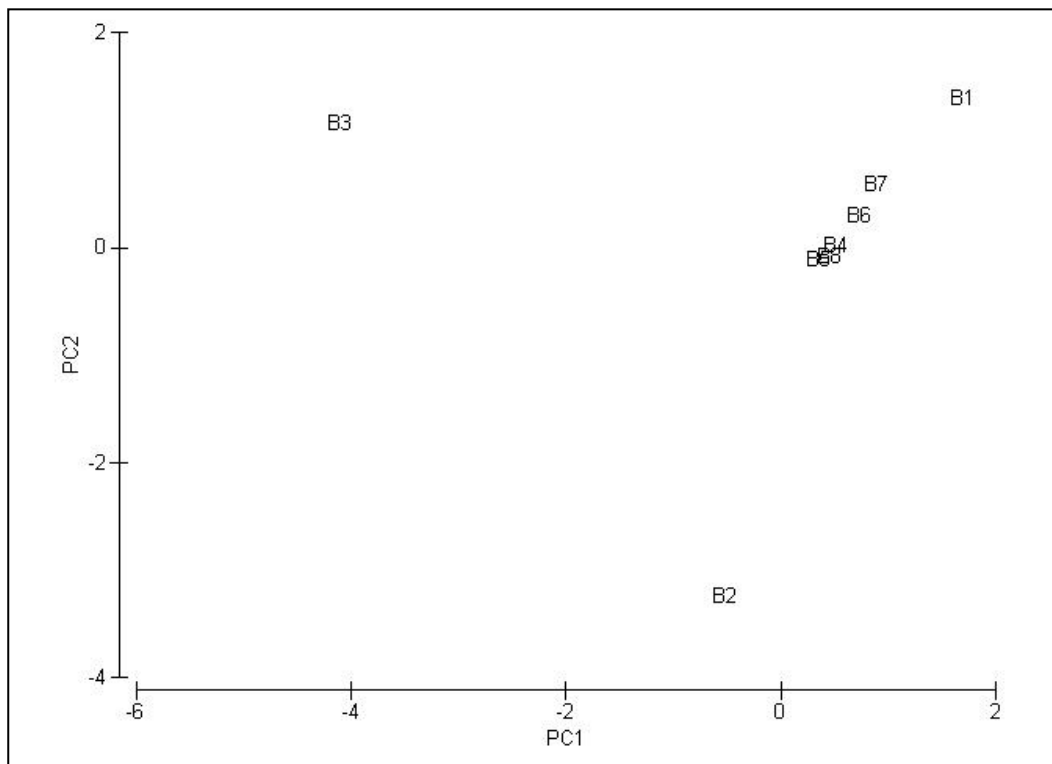


Figure 2. PCA plot of sampling stations based on sediment data in wet season survey

Table 8 shows the results of PCA whereas Figure 3 is a 2-D plot of the PCA results based on the first two PC1 and PC2 of the dry season survey data. Results were generally in line with that from the wet season survey. Total organic matter, median diameter and skewness of the particle size distribution of the sediments were also important parameters to differentiate the sampling stations in the dry season survey. Six of the sampling stations (B1, B4-B8) tended to group closer than the remaining 2 stations B2 and B3. These 6 stations had higher MD ϕ and TOM values. Station B3 had lower TOM, whereas station B2 had lower MD ϕ and TOM levels.

Table 8. Results of PCA on water depth and sediment data in dry season survey

	PC1	PC2	PC3	PC4
Eigen value	3.73	0.87	0.59	0.08
% variation	70.8	16.5	11.2	1.5
Cumulative % variation	70.8	87.3	98.5	100.0
Coefficients in the linear combinations of variables making up PC's)				
Depth	-0.132	-0.388	-0.813	-0.411
Mean TOM	0.498	0.456	0.073	-0.733
Median diameter (MD ϕ)	0.535	-0.061	-0.217	0.296
Inclusive graphic SD (σ)	-0.559	-0.061	0.316	-0.390
Inclusive graphic skewness (Sk ϕ)	-0.299	0.485	-0.244	0.057
Graphic kurtosis (K $_G$)	0.214	-0.631	0.356	-0.224

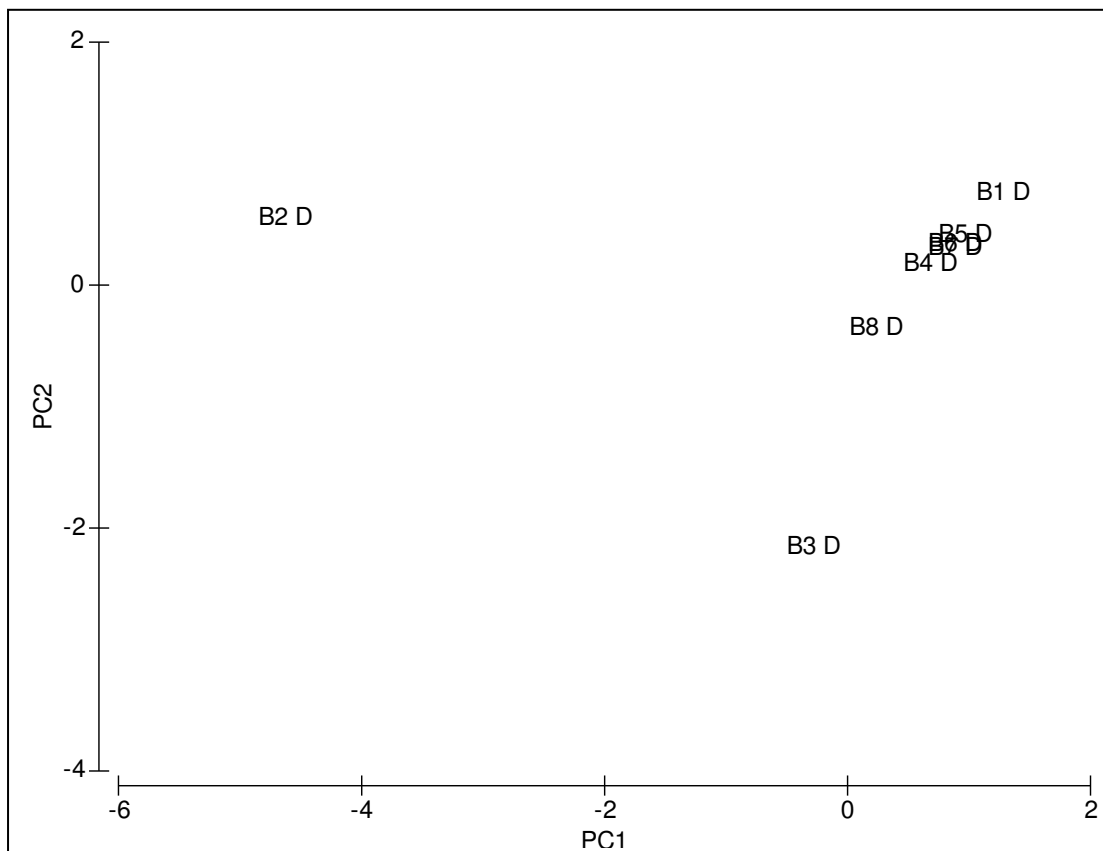


Figure 3. PCA plot of sampling stations based on sediment data in dry season survey (D = dry season sampling)

Table 9 shows the results of PCA whereas Figure 4 is a 2-D plot of the PCA results based on the first two PC1 and PC2 of both wet and dry season survey data. Total organic matter, median diameter and skewness of the particle size distribution of the sediments were important parameters to differentiate the sampling stations in both surveys. Six of the sampling stations (B1, B4-B8) tended to group closer with higher MD ϕ and TOM values, suggesting that there was minimal seasonal difference among them. However, the TOM and MD ϕ values varied significantly between the wet and dry season surveys, as evident from the separation of the same station in the wet and dry season surveys.

Table 9. Results of PCA on water depth and sediment data in wet and dry season surveys

	PC1	PC2	PC3	PC4	PC5
Eigen value	3.31	1.71	0.83	0.13	0.03
% variation	55.1	28.4	13.8	2.1	0.5
Cumulative % variation	55.1	83.5	97.4	99.5	100.0
Coefficients in the linear combinations of variables making up PC's					
Depth (m)	-0.228	-0.359	-0.848	-0.309	-0.071
Mean TOM (%)	0.393	0.491	-0.027	-0.775	-0.059
Median Diameter (MD ϕ)	0.531	0.016	-0.258	0.289	0.007
Inclusive graphic SD (σ)	-0.503	-0.160	0.352	-0.343	-0.322
Inclusive graphic skewness (Sk ϕ)	-0.434	0.450	-0.141	0.015	0.731
Graphic kurtosis (K $_G$)	0.266	-0.634	0.264	-0.321	0.595

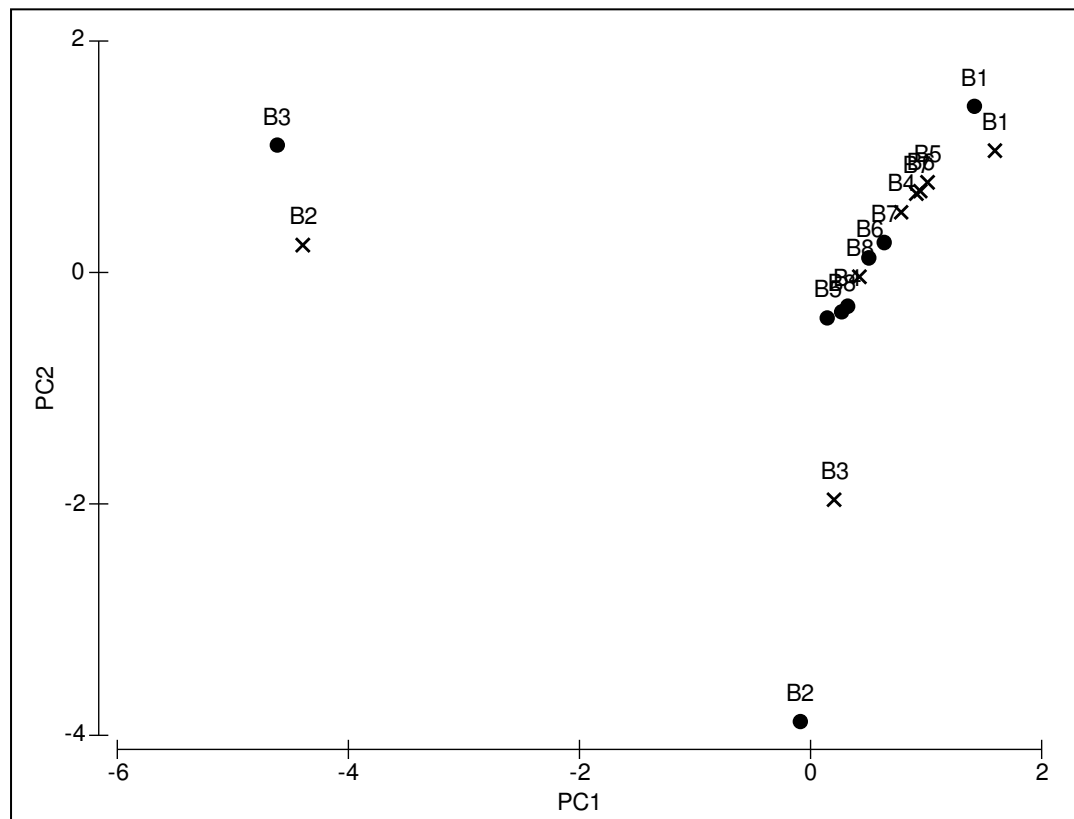


Figure 4. PCA plot of sampling stations based on sediment data in wet and dry season surveys (● = wet season; x = dry season)

4.2 Community Spatial Pattern

4.2.1 Biological Indices

Table 10 lists the values of species richness (d), diversity (H') and evenness (J) calculated for each sampling station for the wet and dry season surveys.

Table 10. Univariate statistics of each sampling station in wet and dry season surveys

Season	Station	d	H'	J
Wet (Aug. 2006)	B1	2.76	0.97	0.34
	B2	7.16	3.05	0.80
	B3	6.35	2.65	0.71
	B4	5.92	2.59	0.73
	B5	6.22	2.66	0.74
	B6	4.92	2.41	0.71
	B7	5.34	2.70	0.79
	B8	5.49	2.80	0.81
Dry (Jan. 2007)	B1	3.52	2.53	0.96
	B2	7.75	3.32	0.87
	B3	8.76	3.43	0.86
	B4	3.46	2.19	0.74
	B5	4.41	1.91	0.58
	B6	4.36	2.32	0.73
	B7	3.01	1.85	0.65
	B8	3.84	1.81	0.59

In the wet season survey, the values of d ranged from 2.76 (station B1) to 7.16 (station B2), H' from 0.97 (station B1) to 3.05 (station B2) and J from 0.34 (station B1) to 0.81 (station B8). Of these 8 stations, the highest species diversity was found at station B2, followed by station B8. Station B1 had the lowest species diversity and evenness, suggesting that this station was dominated by few numerically abundant species in the sediment samples. Shrimp larvae and nemertean spp. were most abundant at this station, accounting to 372 and 34 m⁻², respectively.

In the dry season survey, the values of d ranged from 3.01 (station B7) to 8.76 (station B3), H' from 1.81 (station B8) to 3.43 (station B3) and J from 0.59 (station B8) to 0.96 (station B1). Of these 8 stations, the highest species diversity was found at station B3, followed by station B2. Stations B5, B7 and B8 had the lower species diversity and evenness as compared to the other stations, suggesting that these sites were dominated by few numerically abundant species in the sediment samples. The sipunculan *Apionsoma trichocephalus* and crustacean *Callianassa japonica* were most abundant at these stations, ranging from 98-166 and 10-34 m⁻², respectively.

From both surveys, except for station B1 in the wet season survey and stations B5, B7 and B8 in the dry season survey, the remaining stations had H' over 2.00 with the highest value of 3.43, suggesting that the benthic infauna in the study area was relatively diverse as compared to Kingston Harbour, Jamaica (Wade, 1972), Baja California, USA (Calderon-Aguilera, 1992), Tahiti, French Polynesia, and central Pacific (Frouin and Hutchings, 2001).

4.2.2 Delineation of Spatial Pattern

Figure 5 shows the dendrogram of faunal similarity among the 8 stations based on the results of cluster analysis of the wet season survey data. Based on the results of SIMPROF test, two station groups (B2-B3, B4-B8) and 1 standalone station B1 were identified from the species composition. MDS analysis also showed a similar grouping pattern (Fig. 6), in which the position of stations B2 and B3, and stations B4-B8 was delineated clearly from station B1.

Table 11 summarizes the typical species (in terms of their abundance) for these 2 station groups in the wet season survey. Group B2-B3 was represented by the polychaetes *Prionospio malmgreni*, *Amaeana* sp., *Marphysa stragulum*, *Glycera chirori*, *Cirriformia* sp., *Tharyx* sp. and *Ophiodromus obscura*, nemertean spp. and sipulcuan *Apionsoma trichocephalus*. Group B4-B8 was dominated by the polychaete *Aglaophamus dibranchis*, crustaceans copepod spp. and *Callianassa japonica*, sipunculan *Apionsoma trichocephalus*, nemertean spp. and phoronid *Phoronis* sp.. The standalone station B1 was dominated by shrimp larvae.

Figure 7 shows the dendrogram of faunal similarity among the 8 stations based on the results of cluster analysis of the dry season survey data. Based on the results of SIMPROF test, two station groups (B2-B3, B4-B8) and 1 standalone station B1 were identified from the species composition. MDS analysis also showed a similar grouping pattern (Fig. 8), in which the position of stations B2 and B3, and stations B4-B8 was delineated clearly from station B1.

Table 12 summarizes the typical species (in terms of their abundance) for these 2 station groups in the dry season survey. Group B2-B3 was represented by the polychaetes *Prionospio malmgreni*, *Glycera chirori*, *Tharyx* sp., *Magelona* sp., *Loimia ingens*, *Paralacydonia paradoxa*, *Eunice indica* and *Marphysa sanguinea*, the crustacean amphipod spp. and sipulcuan *Apionsoma trichocephalus*. Group B4-B8 was dominated by the sipunculan *Apionsoma trichocephalus*, nemertean spp., crustacean *Callianassa japonica*, and polychaete *Aglaophamus dibranchis*. The standalone station B1 had impoverished infauna.

4.2.3 Delineation of Seasonal Pattern

To discern seasonal pattern, community data from both wet and dry season surveys were subjected to cluster and MDS analyses. Figure 8 shows the dendrogram of faunal similarity among the 8 stations based on the results of cluster analysis of both wet and dry season survey data. Based on the results of SIMPROF test, three station groups (B1, B2-B3, B4-B8) were identified from the species composition. MDS analysis also showed a similar grouping pattern (Fig. 10), in which the position of stations B2 and B3, and stations B4-B8 was delineated clearly from station B1. From both analyzes, it was apparent that members within these Groups B1, B2-B3 and B4-B8 comprised both wet and dry survey data at the same sampling stations. The present results thus suggested that seasonal changes at these sampling stations were minimal.

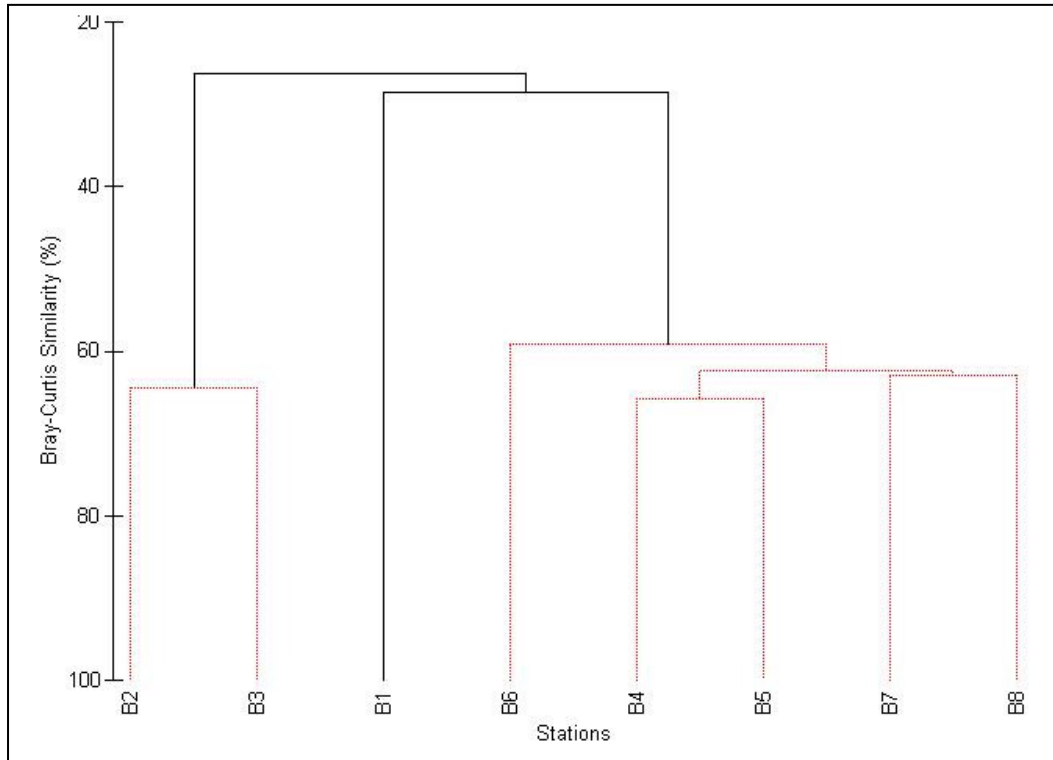


Figure 5. Dendrogram of station groupings in wet season survey (solid lines represent significant delineation of groupings by SIMPROF test)

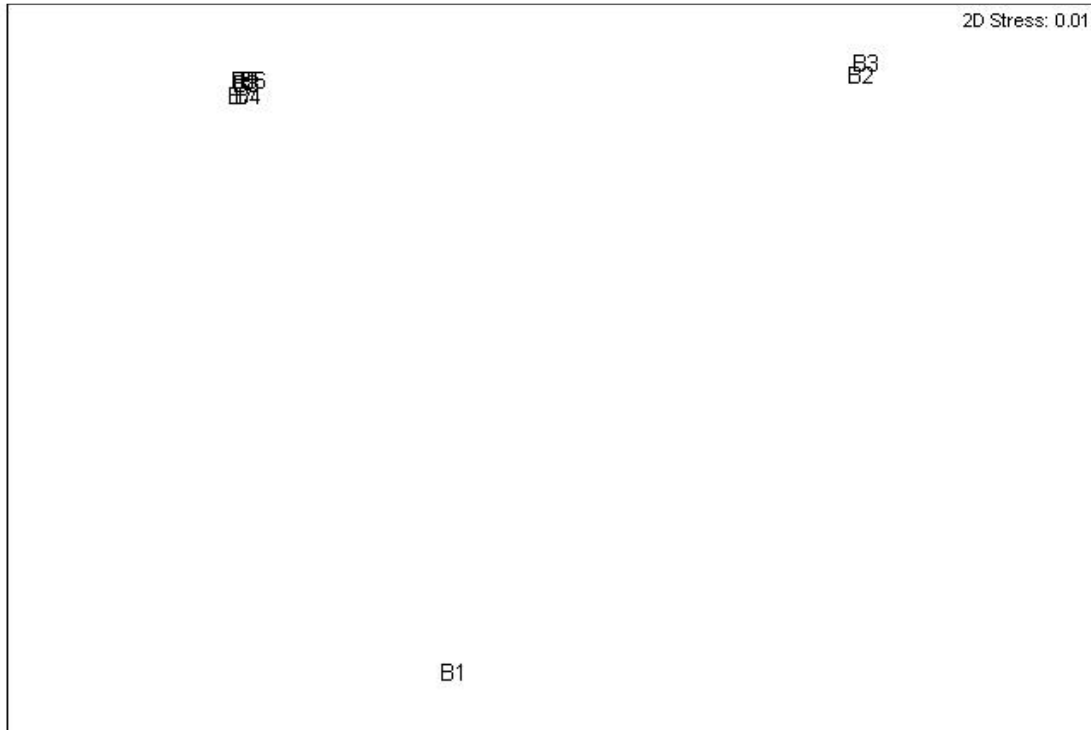


Figure 6. MDS plot of sampling stations in wet season survey

Table 11. Species contribution to station groups in wet season survey
(only species with cumulative % contribution to faunal similarity $\geq 50\%$ are included)

Faunal group	Species	Mean abundance (m ⁻²)	% contribution to faunal similarity within group	Cumulative % contribution to faunal similarity within group
Group B2-B3				
P	<i>Prionospio malmgreni</i>	11.1	10.4	10.4
P	<i>Amaeana</i> sp.	7.0	8.6	19.0
P	<i>Marphysa stragulum</i>	5.9	6.9	25.9
P	<i>Glycera chirori</i>	4.7	5.1	31.0
S	<i>Apionsoma trichocephalus</i>	4.7	5.1	36.1
P	<i>Cirriformia</i> sp.	4.6	4.7	40.8
P	<i>Tharyx</i> sp.	6.8	4.7	45.5
P	<i>Ophiodromus obscura</i>	3.2	3.6	49.1
N	<i>Nemertean</i> spp.	3.2	3.6	52.7
Group B4-B8				
S	<i>Apionsoma trichocephalus</i>	9.2	17.3	17.3
C	Copepod spp.	5.6	8.9	26.2
P	<i>Aglaophamus dibranchis</i>	4.6	8.3	34.5
N	<i>Nemertean</i> spp.	4.3	8.0	42.5
Ph	<i>Phoronis</i> sp.	3.6	5.8	48.3
C	<i>Callianassa japonica</i>	2.8	4.7	53.0

C = Crustacea, N = Nemertea, P = Polychaeta, Ph = Phoronida, S = Sipuncula

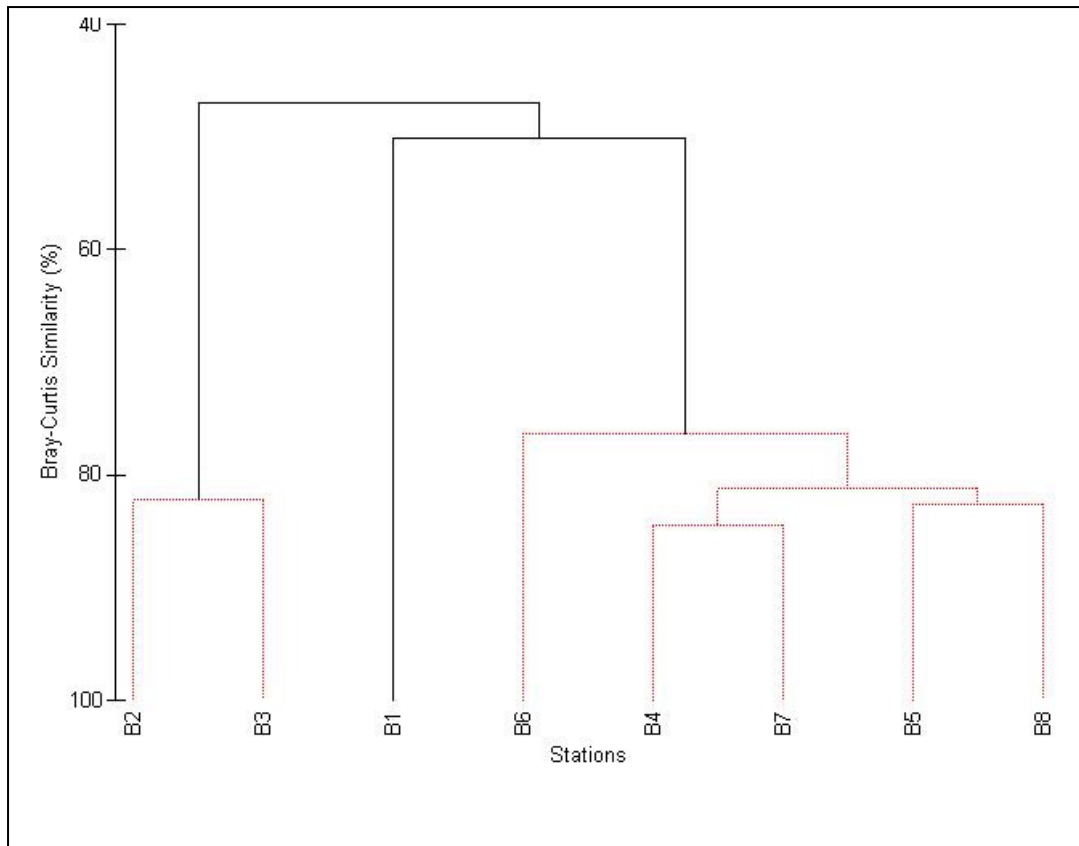


Figure 7. Dendrogram of station groupings in dry season survey (solid lines represent significant delineation of groupings by SIMPROF test)

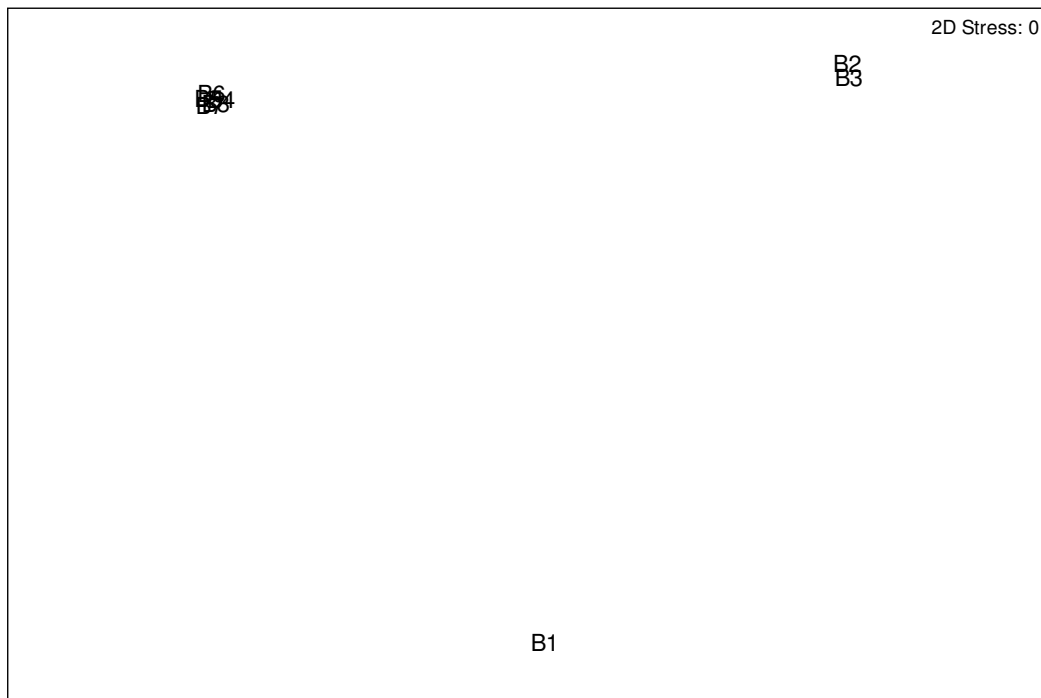


Figure 8. MDS plot of sampling stations in dry season survey

Table 12. Species contribution to station groups in dry season survey
(only species with cumulative % contribution to faunal similarity $\geq 50\%$ are included)

Faunal group	Species	Mean abundance (m ⁻²)	% contribution to faunal similarity within group	Cumulative % contribution to faunal similarity within group
Group B2-B3				
P	<i>Prionospio malmgreni</i>	6.5	8.8	8.8
C	Amphipod spp.	5.9	8.8	17.5
P	<i>Glycera chirori</i>	5.0	6.9	24.4
S	<i>Apionsoma trichocephalus</i>	4.6	5.4	29.8
P	<i>Tharyx</i> sp.	3.8	4.4	34.2
P	<i>Magelona</i> sp.	2.5	3.8	38.0
P	<i>Loimia ingens</i>	3.0	3.8	41.7
P	<i>Paralacydonia paradoxa</i>	2.5	3.8	45.5
P	<i>Eunice indica</i>	3.0	3.1	48.6
P	<i>Marphysa sanguinea</i>	2.7	3.1	51.7
Group B4-B8				
S	<i>Apionsoma trichocephalus</i>	10.5	28.0	28.0
C	<i>Callianassa japonica</i>	4.6	12.0	40.0
P	<i>Aglaophamus dibranchis</i>	3.2	8.8	48.8
N	Nemertean spp.	3.5	8.7	57.5

C = Crustacea, N = Nemertea, P = Polychaeta, S = Sipuncula

Table 13 summarizes the typical species (in terms of their abundance) for these 3 station groups in both wet and dry season surveys. Group B1 was represented by the polychaetes *Lumbrinereis shiinoi* and *Aglaophamus dibranchis*, sipunculan *Apionsoma trichocephalus*, and nemertean spp.. Group B2-B3 was dominated by the polychaetes *Prionospio malmgreni*, *Glycera chirori*, *Tharyx* sp., *Marphysa sanguinea*, *Loimia ingens*, *Magelona* sp. and *Paralacydonia paradoxa*, sipunculan *Apionsoma trichocephalus*, the crustacean amphipod spp. and nemertean spp.. This group was most diverse among the three station groups. Group B4-B8 was characterized by the sipunculan *Apionsoma trichocephalus*, nemertean spp., polychaete *Aglaophamus dibranchis*, and crustacean (ghost shrimp) *Callianassa japonica*.

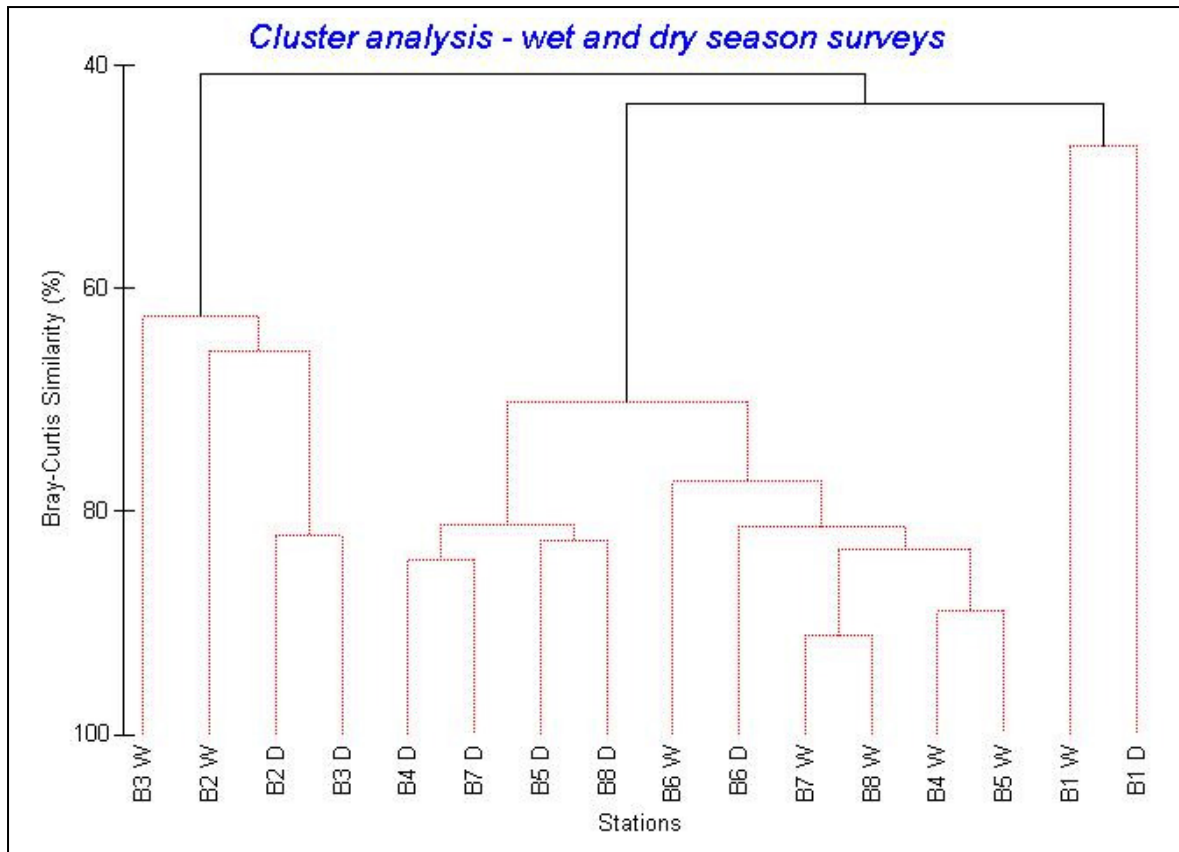


Figure 9. Dendrogram of station groupings in wet and dry season surveys (solid lines represent significant delineation of groupings by SIMPROF test. W = wet season survey; D = dry season survey)

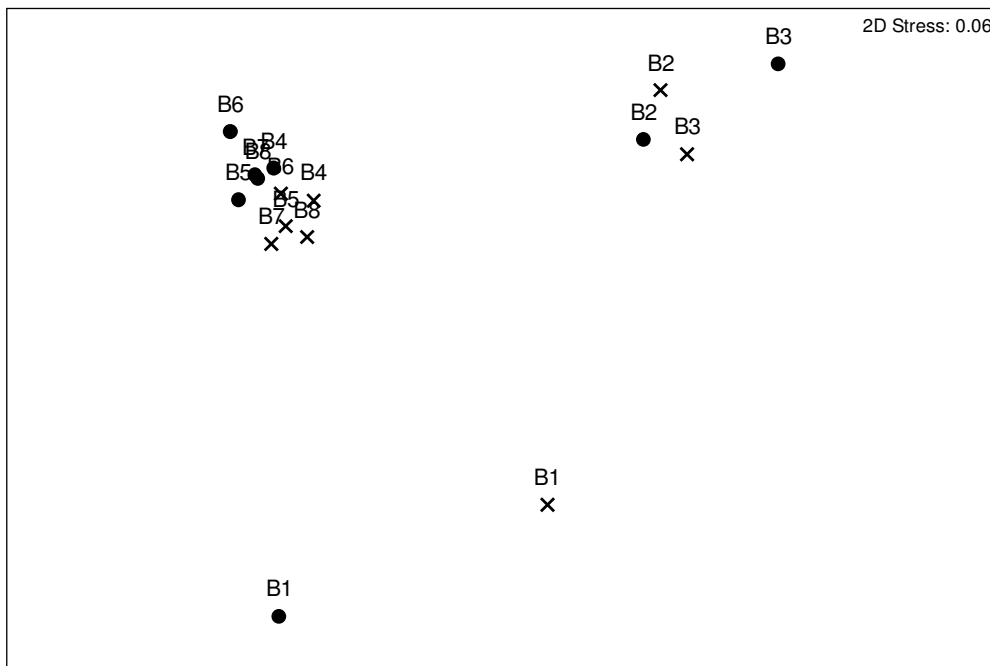


Figure 10. MDS plot of sampling stations in wet and dry season surveys (● = wet season; x = dry season)

Table 13. Species contribution to station groups in wet and dry season surveys

Faunal group	Species	Mean abundance (m ⁻²)	% contribution to faunal similarity within group	Cumulative % contribution to faunal similarity within group
Group B1				
P	<i>Lumbrinereis shiinoi</i>	2.45	14.09	14.09
N	Nemertean spp.	4.14	14.09	28.18
P	<i>Aglaophamus dibranchis</i>	2.73	11.50	39.69
S	<i>Apionsoma trichocephalus</i>	2.00	11.50	51.19
Group B2 - B3				
P	<i>Prionospio malmgreni</i>	8.79	10.07	10.07
P	<i>Glycera chirori</i>	4.81	6.63	16.70
S	<i>Apionsoma trichocephalus</i>	4.65	6.05	22.75
P	<i>Tharyx</i> sp.	5.26	5.24	28.00
C	Amphipod spp.	4.39	4.90	32.89
P	<i>Marphysa stragulum</i>	4.09	4.01	36.90
P	<i>Loimia ingens</i>	2.80	3.82	40.72
P	<i>Magelona</i> sp.	2.54	3.72	44.44
N	Nemertean spp.	2.78	3.65	48.09
P	<i>Paralacydonia paradoxa</i>	2.43	3.38	51.47
Group B4 - B8				
S	<i>Apionsoma trichocephalus</i>	9.83	24.53	24.53
N	Nemertean spp.	3.90	9.19	33.72
P	<i>Aglaophamus dibranchis</i>	3.87	9.04	42.76
C	<i>Callianassa japonica</i>	3.66	8.23	50.99

C = Crustacea, N = Nemertea, P = Polychaeta, S = Sipuncula

4.2.4 Abundance and Biomass Comparison (ABC) Plots

Table 14 shows the W statistic obtained from the ABC plot at each sampling station in the wet and dry season surveys. Details of the plots can be referred to Annex 3.

Table 14. Summary of W statistic from wet and dry surveys

Station	W	Station	W
Wet season survey			
B1	-0.25	B5	0.15
B2	0.31	B6	0.26
B3	0.11	B7	0.25
B4	0.30	B8	0.29
Dry season survey			
B1	0.49	B5	0.19
B2	0.24	B6	0.10
B3	0.25	B7	-0.07
B4	0.18	B8	0.17

In the wet season survey, except for station B1 which had a negative W value, other stations showed positive W values ranging from 0.106 to 0.308. According to Warwick and Clarke (1994), a negative W value suggested “disturbed” state in the sediment and W value <0.1 “moderately disturbed”. From the above data, except for station B1, all other stations were considered “undisturbed”.

In the dry season survey, except for station B7 which had a negative W value, other stations showed positive W values ranging from 0.10 to 0.49. According to Warwick and Clarke (1994), a negative W value suggested “disturbed” state in the sediment and W value <0.1 “moderately disturbed”. From the above data, except for station B7, all other stations were considered “undisturbed”.

All in all, with few exceptions noted at both the wet and dry season surveys, the sediment quality of the study area appeared to be “undisturbed”.

4.3 Correlation Between Benthic Assemblages and Sediment Parameters

From the wet season survey data, the BIO-ENV program results showed that water depth and sediment inclusive graphic standard deviation (σ) had the best correlation (Spearman rank correlation = 0.85) to explain the station groups. Figures 11 and 12 show the bubble plots of these two parameters superimposed on the MDS plot of Figure 6. The larger the size of the bubble, the higher is the value of the physical parameter. In general, station B1 had shallower depth (Fig. 11) whereas station group B2-B3 had larger σ values (Fig. 12).

From the dry season survey data, the BIO-ENV program results showed that water depth and sediment TOM had the best correlation (Spearman rank correlation = 0.72) to explain the station groups. Figures 13 and 14 show the bubble plots of these two parameters superimposed on the MDS plot of Figure 8. The larger the size of the bubble, the higher is the value of the physical parameter. In general, station B1 had shallower depth (Fig. 13) whereas station group B2-B3 had lower TOM values (Fig. 14).

From both the wet and dry season survey data, the BIO-ENV program results showed that water depth and sediment inclusive graphic standard deviation (σ) had the best correlation (Spearman rank correlation = 0.79) to explain the station groups. Figures 15 and 16 show the bubble plots of these two parameters superimposed on the MDS plot of Figure 10. The larger the size of the bubble, the higher is the value of the physical parameter. In general, station B1 had shallower depth (Fig. 15) whereas station group B2-B3 had larger σ values (Fig. 16).

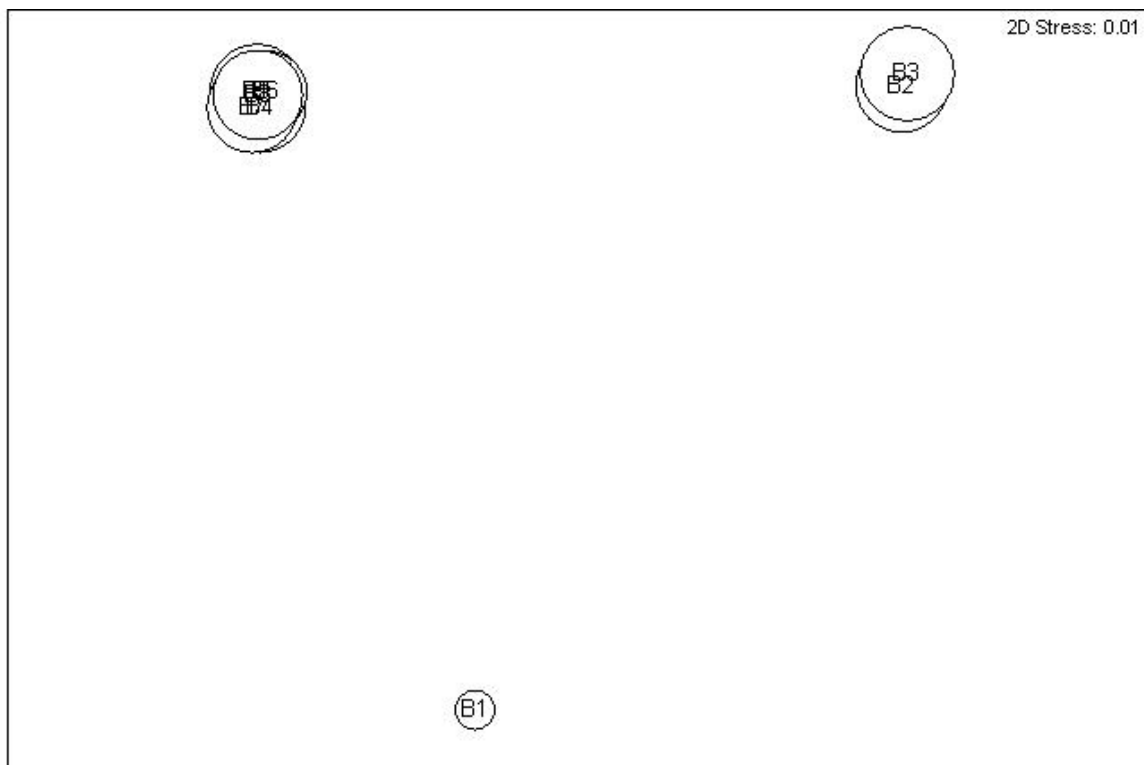


Figure 11. Bubble plot of superimposing water depth on the sampling stations based on MDS in wet season survey

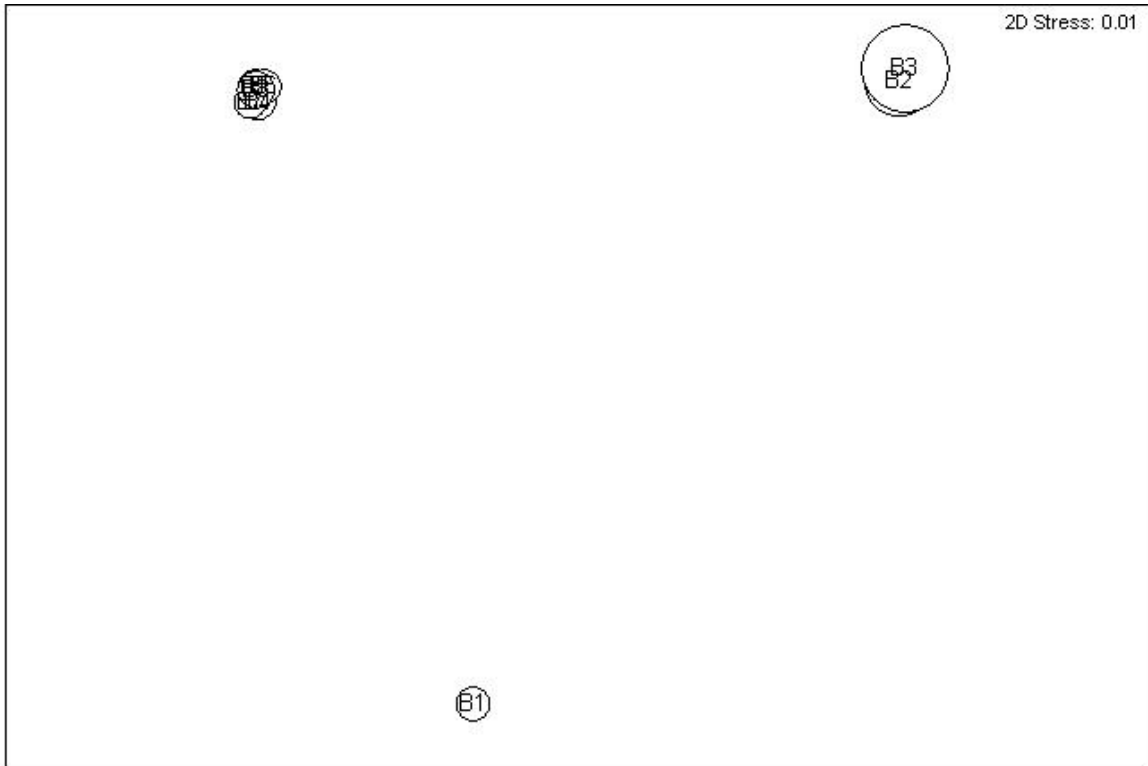


Figure 12. Bubble plot of superimposing sediment inclusive graphic standard deviation (σ) on the sampling stations based on MDS in wet season survey

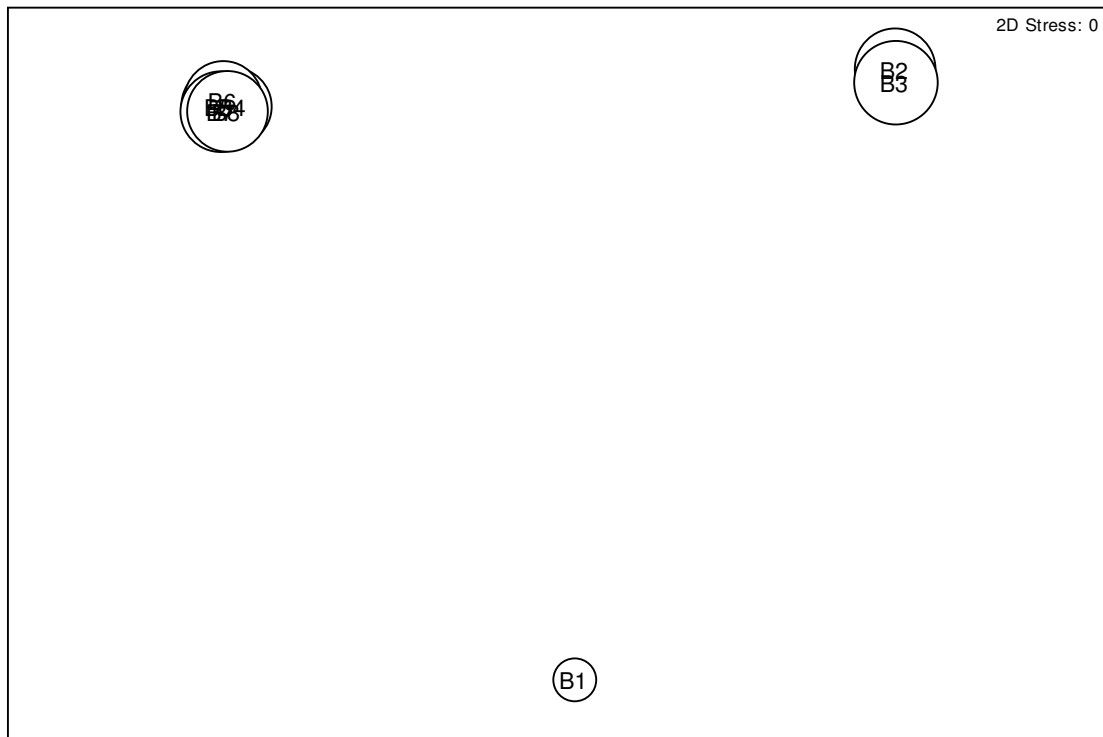


Figure 13. Bubble plot of superimposing water depth on the sampling stations based on MDS in dry season survey

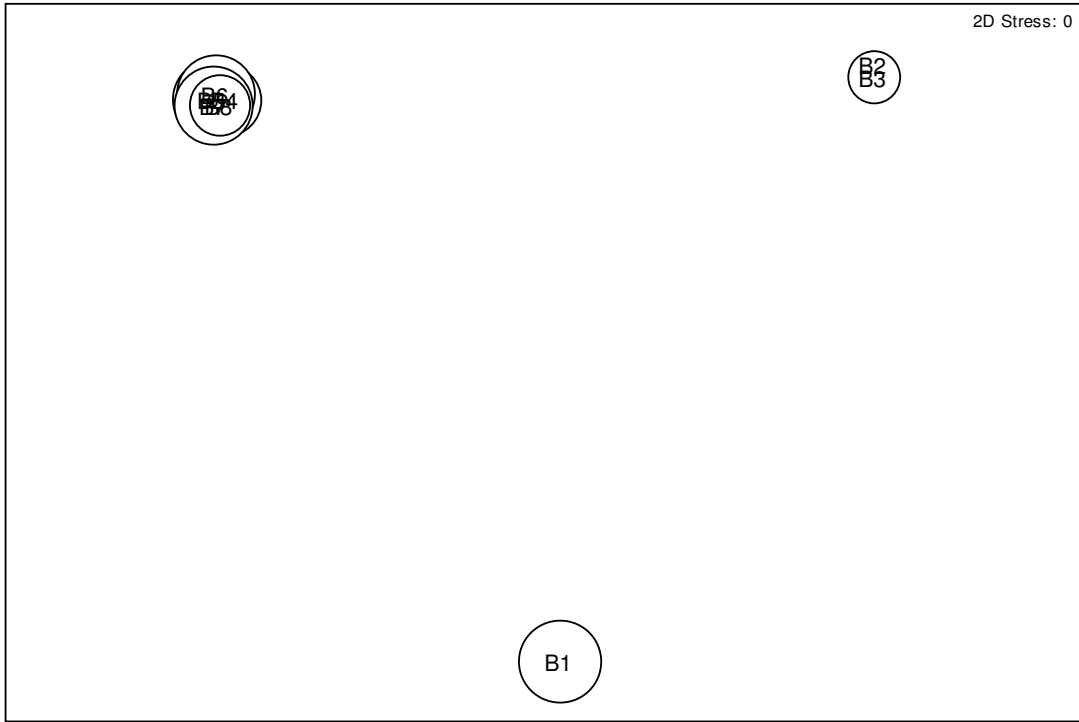


Figure 14. Bubble plot of superimposing sediment TOM on the sampling stations based on MDS in dry season survey

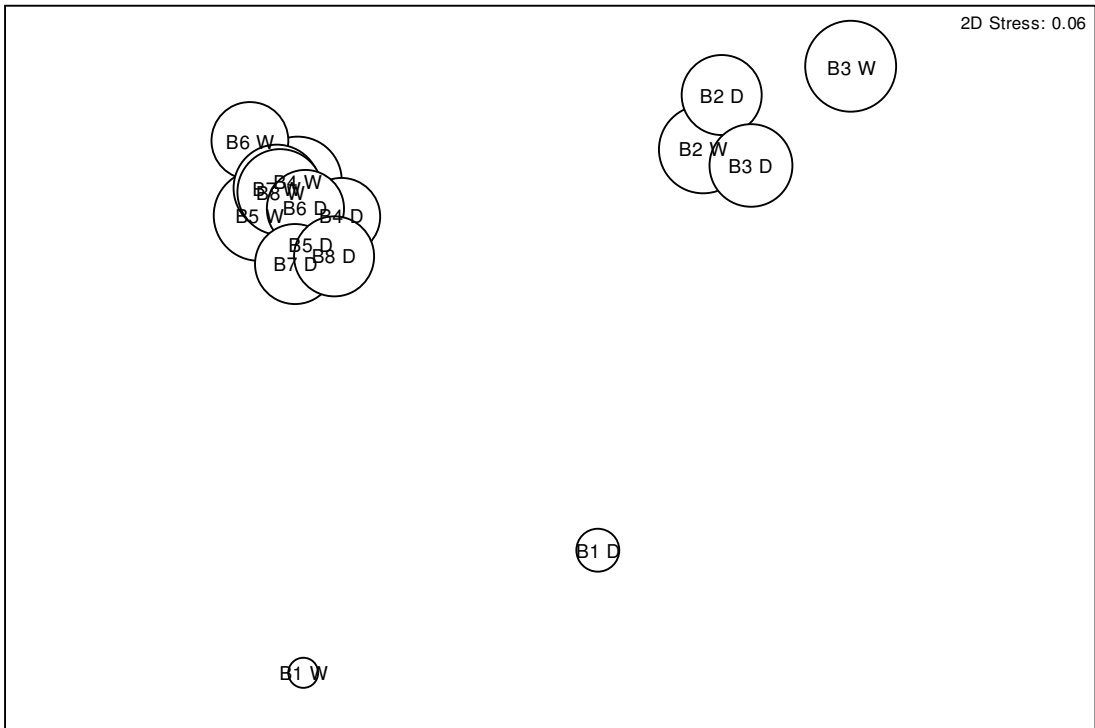


Figure 15. Bubble plot of superimposing water depth on the sampling stations based on MDS in wet and dry season surveys (W = wet season survey; D = dry season survey)

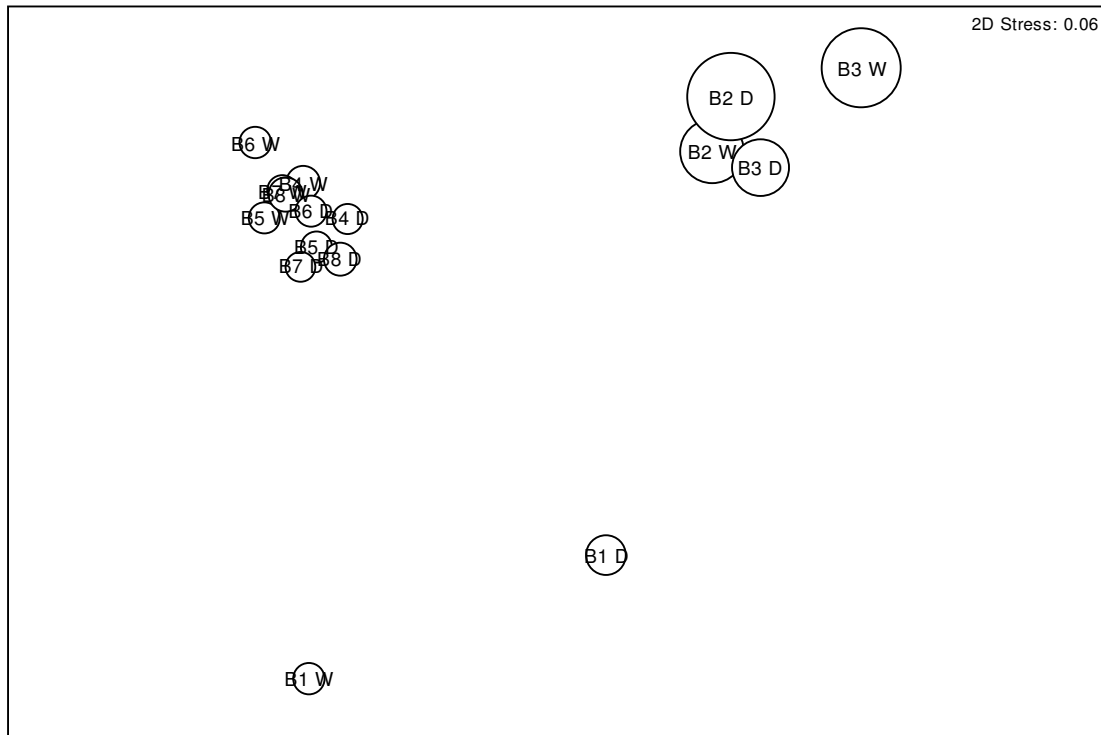


Figure 16. Bubble plot of superimposing sediment inclusive graphic standard deviation (σ) on the sampling stations based on MDS in wet and dry season surveys (W = wet season survey; D = dry season survey)

4.4 General Observations

Significantly higher sediment TOM was noted at the sampling stations in the dry as compared to that in the wet season survey. However, more individuals of the infauna were found in the wet than the dry season survey.

Polychaete annelids comprised the bulk of benthic species. Other dominant species included small crabs and shells. Of the 107 species recorded in both surveys, some 66% of them occurred in both August and January samplings, suggesting that most of these species were common in the study area. The community structure of the study area was generally divided into 3 station groups: B1 close to the Tathong Channel, B2-B3 south of the Nine Pins, and B4-B8 in Mirs Bay. However, no seasonal pattern could be discernible from the survey results within these station groups.

Overall, the benthic communities in the survey area are relatively diverse, except at station B1, at which a high abundance of shrimp larvae was recorded in the August sampling, and stations B5, B7 and B8, which had relatively lower species diversity in the January sampling. In the wet season survey, the occurrence of abundant shrimp larvae was possibly a transient phenomenon. If these larvae were omitted from the data, a higher species diversity and evenness would be registered, $d = 3.50$, $H' = 2.26$ and $J = 0.80$, and comparable to other sampling stations. The W statistic would be +0.11, which was considered relatively “undisturbed” as at other sampling stations. In the dry season survey, only station B7 showed a slightly negative value of W statistic, which was regarded “moderately disturbed” in sediment quality.

Apart from water depth, the spatial pattern of the benthic composition in the wet season survey was best correlated with the inclusive graphic standard deviation (σ), or the degree of sorting, of the sediments. However, the spatial pattern of the benthic composition in the dry season sampling was best correlated with total organic matter of the sediments. Overall, when both survey results were analyzed, water depth and sorting of sediments were best correlated with the community pattern.

Of all the species recorded, the cephalochordate (amphioxus) *Branchiostoma belcheri* is of high conservation value in Hong Kong waters. Amphioxus is small, eel-like animals that spend much of their time buried in sand. They are one of the primitive forms of chordates, and, because of their remarkable morphology, they help scientists to understand the morphological changes during evolution from invertebrates to vertebrates. It is a second priority protection species in China (Huang, 2006) and listed in the registry of “Endangered Animals of Japanese Marine and Fresh Water Organisms” issued by the Japan Fisheries Resource Conservation Association (Kubokawa et al., 1998). *B. belcheri* was recorded at stations B2 and B3 in the wet season survey. The specimens obtained were juveniles, less than half year old. In the dry season survey, there was no record of *B. belcheri* found at all the sampling stations.

One location (B3) with a density of 64 m⁻² was recorded in the wet (summer) survey only. In comparison to a previous study (CCPC, 2002), densities of amphioxus up to some 100 m⁻² were found at sampling points near Tai Long Wan, Sai Kung (CCPC, 2002). A further study by Shin et al. (2006) further confirmed that individuals of 100-400 m⁻² can be found in sediments at Tai Long Wan and adjacent areas in both summer and winter surveys. The occurrence of small juveniles at one of the sampling locations in the summer would possibly be caused by random settlement of the young in sediments via the planktonic larval stage of the animals. Their absence in the winter might be due to the less than optimal conditions for their continual survival after settlement. The present findings thus suggest that the survey area is not a major habitat for this animal.

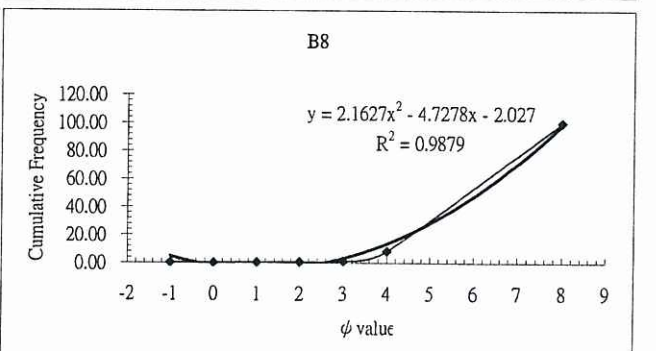
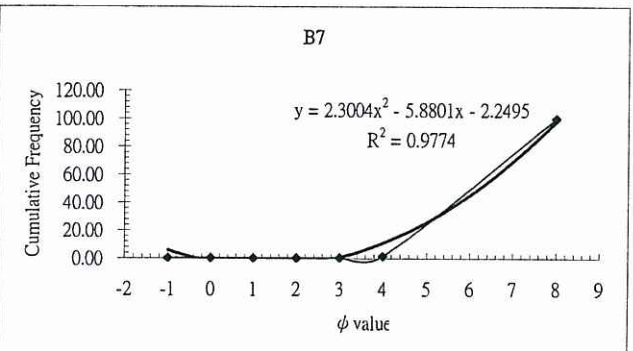
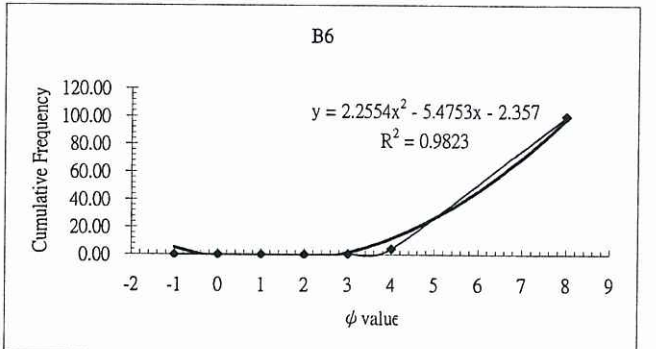
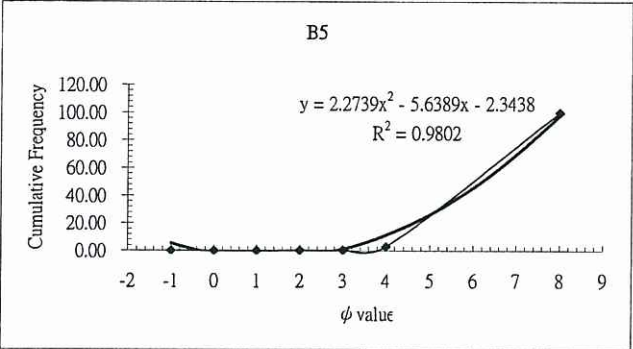
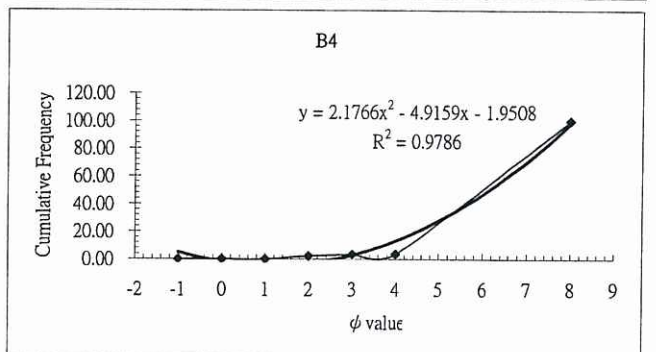
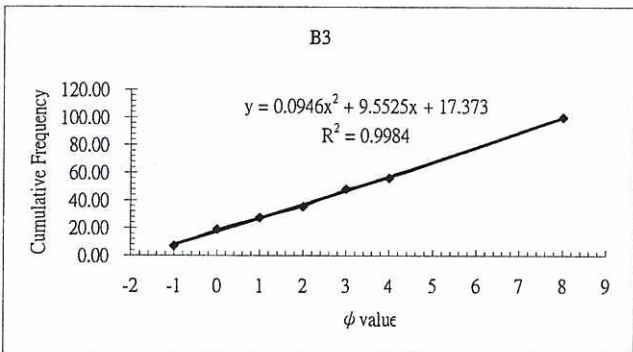
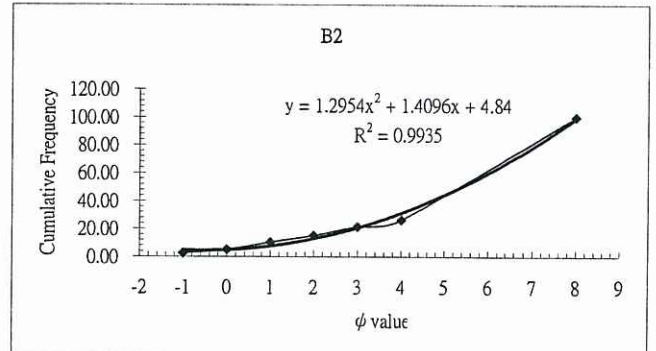
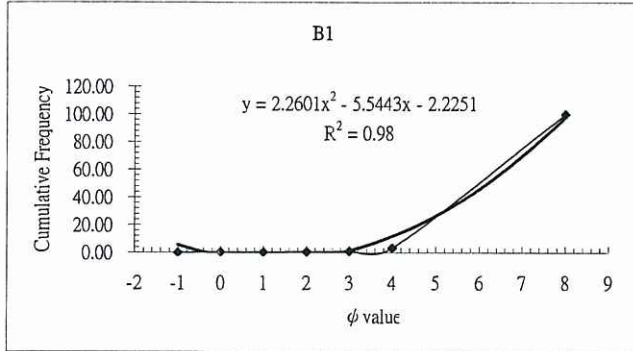
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Annex 1
Data for Determination of Sediment Particle Size Distribution and
Total Organic Matter (TOM), and Photographic Records

Season	Station	ϕ value	Weight (g)	Cumulative wt (g)	Cumulative %
Wet (Aug. 2006)	B1	-1	0.06	0.06	0.04
		0	0.18	0.24	0.15
		1	0.08	0.32	0.20
		2	0.38	0.70	0.44
		3	0.63	1.33	0.84
		4	3.75	5.08	3.21
		8	153.17	158.25	100.00
		B2	-1	4.13	4.13
	0		4.55	8.68	5.19
	1		8.53	17.21	10.29
	2		8.38	25.59	15.30
	3		10.22	35.81	21.40
	4		8.12	43.93	26.26
	8		123.37	167.30	100.00
	B3		-1	20.76	20.76
		0	36.80	57.56	18.96
		1	25.72	83.28	27.43
		2	24.09	107.37	35.36
		3	39.33	146.70	48.32
		4	23.60	170.30	56.09
		8	133.33	303.63	100.00
		B4	-1	0.01	0.01
	0		0.05	0.06	0.04
	1		0.01	0.07	0.04
	2		3.77	3.84	2.37
	3		1.73	5.57	3.44
	4		0.35	5.92	3.65
	8		156.12	162.04	100.00
	B5		-1	0.04	0.04
		0	0.01	0.05	0.03
		1	0.05	0.10	0.06
		2	0.13	0.23	0.14
		3	0.60	0.83	0.50
		4	4.19	5.02	3.01
		8	161.97	166.99	100.00
		B6	-1	0.01	0.01
	0		0.03	0.04	0.02
	1		0.06	0.10	0.06
	2		0.07	0.17	0.10
	3		0.52	0.69	0.40
	4		6.35	7.04	4.10
	8		164.66	171.70	100.00
	B7		-1	0.21	0.21
		0	0.01	0.22	0.14
		1	0.05	0.27	0.17
		2	0.11	0.38	0.24
		3	0.36	0.74	0.46
		4	2.00	2.74	1.70
8		158.50	161.24	100.00	
B8		-1	0.35	0.35	0.18
	0	0.24	0.59	0.30	
	1	0.30	0.89	0.45	
	2	0.29	1.18	0.60	
	3	1.07	2.25	1.14	
	4	14.02	16.27	8.23	
	8	181.31	197.58	100.00	

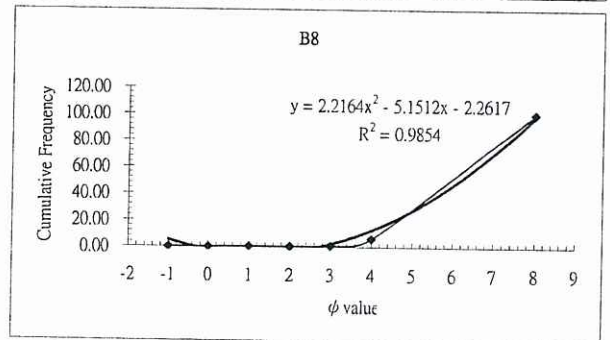
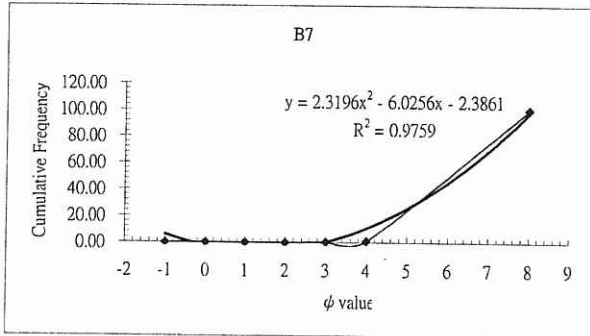
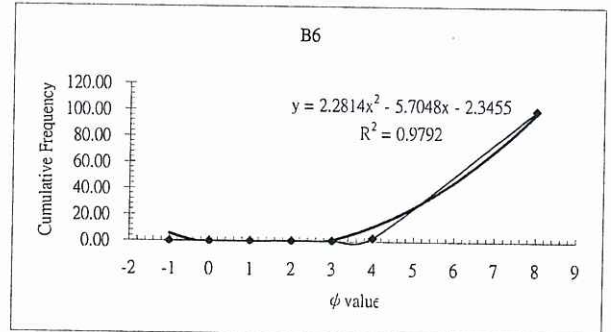
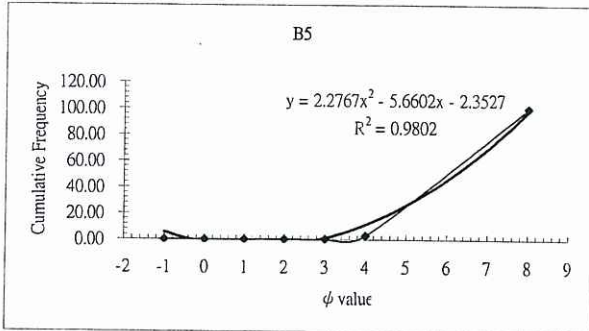
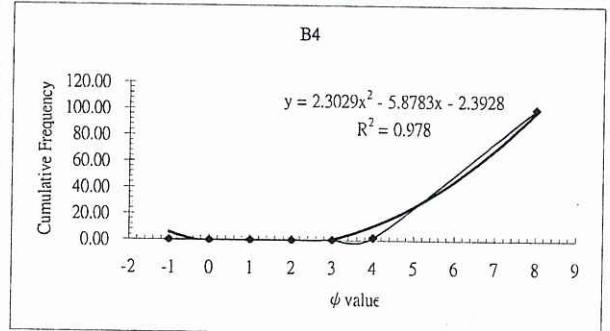
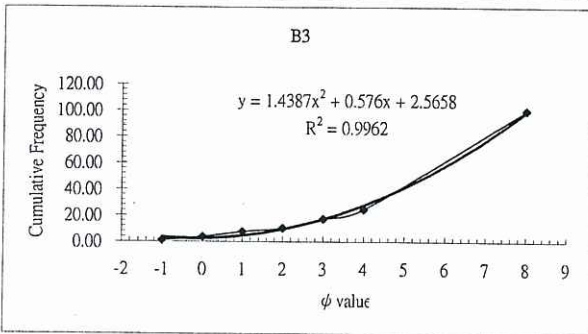
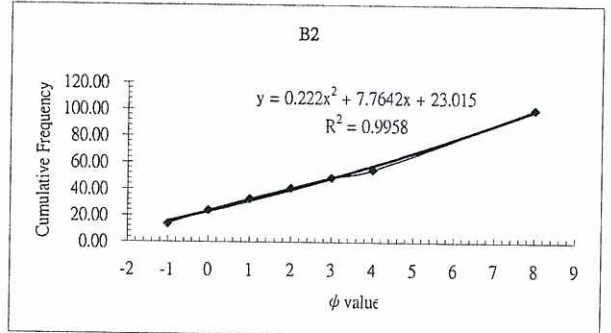
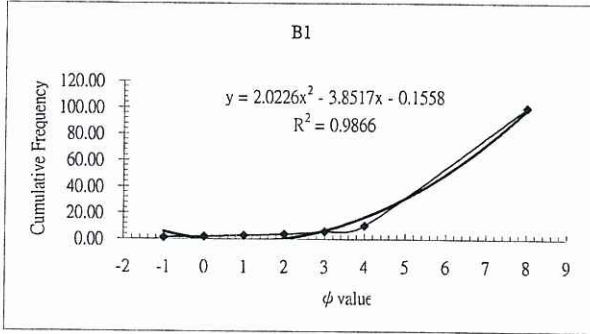


Season	Station	Replicate	Fresh wt. (g)	Wt. after 100°C (g)	Wt. after 500°C (g)	TOM d.w. (%)	Mean TOM (%)	±SD (%)
Wet (Aug. 2006)	B1	a	5.54	2.67	2.49	6.86	6.78	0.13
		b	5.15	2.33	2.18	6.69		
	B2	a	5.15	4.95	4.81	2.70	2.43	0.38
		b	5.13	4.93	4.82	2.16		
	B3	a	5.23	4.19	4.02	4.18	3.69	0.70
		b	5.27	4.20	4.06	3.19		
	B4	a	5.32	2.66	2.52	5.13	5.36	0.33
		b	5.65	2.92	2.76	5.59		
	B5	a	5.23	3.09	2.96	4.24	4.84	0.85
		b	5.63	3.36	3.17	5.44		
	B6	a	5.56	3.42	3.26	4.68	5.31	0.88
		b	5.63	2.82	2.65	5.93		
	B7	a	5.49	2.53	2.37	6.37	6.55	0.25
		b	5.24	2.96	2.76	6.72		
	B8	a	5.13	3.60	3.41	5.26	4.98	0.39
		b	5.56	2.96	2.82	4.71		

Wet season survey



Season	Station	ϕ value	Weight (g)	Cumulative wt (g)	Cumulative %
Dry (Jan. 2007)	B1	-1	1.39	1.39	1.18
		0	0.87	2.26	1.91
		1	1.07	3.33	2.82
		2	0.96	4.29	3.63
		3	2.62	6.91	5.84
		4	5.16	12.07	10.21
		8	106.20	118.27	100.00
		B2	-1	26.93	26.93
	0		20.09	47.02	23.84
	1		17.42	64.44	32.68
	2		16.36	80.80	40.97
	3		15.07	95.87	48.62
	4		11.45	107.32	54.42
	8		89.88	197.20	100.00
	B3		-1	1.31	1.31
		0	3.17	4.48	3.62
		1	4.93	9.41	7.60
		2	3.35	12.76	10.30
		3	8.50	21.26	17.17
		4	9.30	30.56	24.68
		8	93.27	123.83	100.00
		B4	-1	0.01	0.01
	0		0.01	0.02	0.02
	1		0.01	0.03	0.03
	2		0.01	0.04	0.04
	3		0.12	0.16	0.15
	4		1.81	1.97	1.85
	8		104.64	106.61	100.00
	B5		-1	0.01	0.01
		0	0.03	0.04	0.05
		1	0.01	0.05	0.06
		2	0.07	0.12	0.14
		3	0.17	0.29	0.33
		4	2.32	2.61	3.01
		8	84.17	86.78	100.00
		B6	-1	0.01	0.01
	0		0.01	0.02	0.02
	1		0.01	0.03	0.03
	2		0.22	0.25	0.29
	3		0.10	0.35	0.40
	4		1.89	2.24	2.57
	8		84.81	87.05	100.00
	B7		-1	0.01	0.01
		0	0.01	0.02	0.02
		1	0.01	0.03	0.04
		2	0.04	0.07	0.09
		3	0.07	0.14	0.17
		4	0.58	0.72	0.89
8		80.20	80.92	100.00	
B8		-1	0.06	0.06	0.08
	0	0.01	0.07	0.09	
	1	0.04	0.11	0.15	
	2	0.04	0.15	0.20	
	3	0.31	0.46	0.61	
	4	4.09	4.55	6.03	
	8	70.91	75.46	100.00	



Season	Station	Replicate	Fresh wt. (g)	Wt. after 100°C (g)	Wt. after 500°C (g)	TOM d.w. (%)	Mean TOM (%)	±SD (%)
Dry (Jan. 2007)	B1	a	5.37	2.20	2.03	7.85	7.70	0.22
		b	5.66	2.09	1.93	7.54		
	B2	a	5.21	3.38	3.28	3.05	2.73	0.45
		b	5.89	3.47	3.39	2.41		
	B3	a	5.41	2.72	2.59	4.44	4.43	0.00
		b	5.63	2.91	2.78	4.43		
	B4	a	5.22	2.37	2.22	6.28	6.44	0.23
		b	5.81	2.47	2.31	6.60		
	B5	a	5.55	1.96	1.80	7.75	7.40	0.49
		b	5.62	2.21	2.05	7.06		
	B6	a	5.47	2.31	2.14	7.21	7.13	0.11
		b	5.33	2.29	2.12	7.06		
	B7	a	5.22	2.27	2.10	7.54	7.18	0.51
		b	5.08	2.22	2.07	6.82		
	B8	a	5.67	2.17	2.04	5.58	5.20	0.54
		b	5.48	2.41	2.29	4.81		

Dry season survey



Annex 2
Species List and Sample Data Sheets

Species list of macrobenthic animals collected from the wet season survey

Phylum	Class	Order	Family	Species
Nemertinea				Nemertean spp.
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Chloeia flava</i>
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Linopherus paucibranchiata</i>
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Capitella</i> sp.
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus</i> sp.
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus</i> sp.
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa sanguinea</i>
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>
Annelida	Polychaeta	Eunicida	Lumbrineriidae	<i>Lumbriner is nagae</i>
Annelida	Polychaeta	Eunicida	Lumbrineriidae	<i>Lumbriner is shiinoi</i>
Annelida	Polychaeta	Eunicida	Onuphidae	<i>Onuphis eremita</i>
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina acuminata</i>
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Phylo ornatus</i>
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Paraonella</i> sp.
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania brevis</i>
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera chirori</i>
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>
Annelida	Polychaeta	Phyllodocida	Hesionedae	<i>Ophiodromus angutifrons</i>
Annelida	Polychaeta	Phyllodocida	Hesionedae	<i>Ophiodromus obscura</i>
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus sinensis</i>
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Leonnates persica</i>
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nectoneanthes alatopalpis</i>
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce</i> sp.
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Otopsis</i> sp.
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Gattyana</i> sp.
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Harmothoe</i> sp.
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidasthenia</i> sp.
Annelida	Polychaeta	Phyllodocida	Sigalionidae	<i>Ehlersileanira hwanghaiensis</i>
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Cirriformia</i> sp.
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona</i> sp.
Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus hystricosus</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Minuspio cirrifera</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Paraprionospio pinnata</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Polydora</i> sp.
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio malmgreni</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio saccifera</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Rhynchospio</i> sp.
Annelida	Polychaeta	Spionida	Spionidae	<i>Scoelepis squamata</i>
Annelida	Polychaeta	Spionida	Trochochaetidae	<i>Trochochaeta diverapoda</i>
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis scutata</i>
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Anobothrus</i> sp.
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana</i> sp.
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia bandera</i>
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia ingens</i>

Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>
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Phylum	Class	Order	Family	Species
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Mabellarca consociata</i>
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Solidicorbula tunicata</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Angulus emarginatus</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Macoma praeurpta</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina iridella</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina minuta</i>
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Dosinia derupta</i>
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Timoclea lionota</i>
Mollusca	Gastropoda	Mesogastropoda	Naticidae	<i>Polinices mammata</i>
Arthropoda	Crustacea	Amphipoda		Amphipod spp.
Arthropoda	Crustacea	Copepoda		Copepod spp.
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus brevicristatus</i>
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus distinguendus</i>
Arthropoda	Crustacea	Decapoda	Callianassidae	<i>Callianassa japonica</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Eucrate costata</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Goneplax</i> sp.
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Typhlocarcinops canaliculata</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Typhlocarcinops denticarpus</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Typhlocarcinus villosus</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Xenophthalmus pinnotheroides</i>
Arthropoda	Crustacea	Decapoda	Pasiphaeidae	<i>Leptocheila aculeocaudata</i>
Arthropoda	Crustacea	Decapoda	Penaeeidae	<i>Metapenaeopsis barbata</i>
Arthropoda	Crustacea	Decapoda	Pinnotheridae	<i>Neoxenophthalmus obscurus</i>
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Raphidopus ciliatus</i>
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis hongkongensis</i>
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis natator</i>
Arthropoda	Crustacea	Decapoda	Processidae	<i>Processa japonica</i>
Arthropoda	Crustacea	Decapoda		Shrimp larvae
Arthropoda	Crustacea	Stomatopoda		Mantis shrimp larvae
Phoronida	Phoronidea		Phoronidae	<i>Phoronis</i> sp.
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphioplus laevis</i>
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphipholis squamata</i>
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphiura hexactis</i>
Chordata	Amphioxii	Amphioxiformes	Amphioxidae	<i>Branchiostoma belcheri</i>
Chordata	Osteichthyes	Anguilliformes	Ophichthyidae	<i>Ophichthus</i> sp.
Chordata	Osteichthyes	Gadiformes	Bregmacerotidae	<i>Bregmaceros macclellandi</i>
Chordata	Osteichthyes	Gadiformes	Bregmacerotidae	<i>Bregma ceros atlanticus</i>
Chordata	Osteichthyes	Perciformes	Gobiidae	<i>Ctenogobius brevirostris</i>
Chordata	Osteichthyes	Perciformes	Taenionidae	<i>Odontamblyopus</i> sp.

Species list of macrobenthic animals collected from the dry season survey

Phylum	Class	Order	Family	Species
Nemertinea				Nemertean spp.
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Linopherus paucibranchiata</i>
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Capitella</i> sp.
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus</i> sp.
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus</i> sp.
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa sanguinea</i>
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>
Annelida	Polychaeta	Eunicida	Lumbrineriidae	<i>Lumbrineris nagae</i>
Annelida	Polychaeta	Eunicida	Lumbrineriidae	<i>Lumbrineris shiinoi</i>
Annelida	Polychaeta	Eunicida	Dorvilleidae	<i>Schistomeringos rudolphi</i>
Annelida	Polychaeta	Eunicida	Onuphidae	<i>Onuphis eremita</i>
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina acuminata</i>
Annelida	Polychaeta	Opheliida	Scalibregmidae	<i>Scalibregma inflatum</i>
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Phylo ornatus</i>
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Paraonella</i> sp.
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania brevis</i>
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera chirori</i>
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Ophiodromus angutifrons</i>
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus sinensis</i>
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Leonnates persica</i>
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nectoneanthes alatopalpis</i>
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce</i> sp.
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Otopsis</i> sp.
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Harmothoe</i> sp.
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidasthenia</i> sp.
Annelida	Polychaeta	Phyllodocida	Sigalionidae	<i>Ehlersileanira hwanghaiensis</i>
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Cirriformia</i> sp.
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona</i> sp.
Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus hystricosus</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Paraprionospio pinnata</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio malmgreni</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio saccifera</i>
Annelida	Polychaeta	Spionida	Spionidae	<i>Scolecopsis squamata</i>
Annelida	Polychaeta	Spionida	Trochochaetidae	<i>Trochochaeta diverapoda</i>
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis scutata</i>
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Anobothrus</i> sp.
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana</i> sp.
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia bandera</i>
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia ingens</i>
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Terebellides stroemii</i>
Annelida	Polychaeta	Sabellida	Sabellidae	<i>Laonome indica</i>
Sipuncula	Phascolosomatidea	Phascolosomiformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>
Echiura	Echiurida	Echiuroinea	Echiuridae	<i>Thalassema sabinum</i>

Phylum	Class	Order	Family	Species
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Solidicorbula tunicata</i>
Mollusca	Bivalvia	Veneroida	Luncinidae	<i>Anodontia stearnsiana</i>
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Mactrinula dolabrata</i>
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Mactrinula reevesii</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Macoma incongrua</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Macoma praerupta</i>
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina minuta</i>
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Dosinia derupta</i>
Arthropoda	Crustacea	Amphipoda		Amphipod spp.
Arthropoda	Crustacea	Copepoda		Copepod spp.
Arthropoda	Crustacea	Tanaidacea	Paratanaidae	<i>Aapseudes</i> sp.
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus brevicristatus</i>
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus distinguendus</i>
Arthropoda	Crustacea	Decapoda	Penaeidae	<i>Miyadiella podophthalmus</i>
Arthropoda	Crustacea	Decapoda	Callianassidae	<i>Callianassa japonica</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Eucrate costata</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Typhlocarcinops canaliculata</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Typhlocarcinops denticarpus</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Typhlocarcinus villosus</i>
Arthropoda	Crustacea	Decapoda	Goneplacidae	<i>Xenophthalmus pinnotheroides</i>
Arthropoda	Crustacea	Decapoda	Pasiphaeidae	<i>Leptocheila aculeocaudata</i>
Arthropoda	Crustacea	Decapoda	Pinnotheridae	<i>Neoxenophthalmus obscurus</i>
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Porcellanella triloba</i>
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Raphidopus ciliatus</i>
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis affinis</i>
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis variegata</i>
Arthropoda	Crustacea	Decapoda	Processidae	<i>Processa japonica</i>
Phoronida	Phoronidea		Phoronidae	<i>Phoronis</i> sp.
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphipholis squamata</i>
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphiura hexactis</i>
Chordata	Osteichthyes	Anguilliformes	Ophichthyidae	<i>Ophichthus</i> sp.
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Odontamblyopus</i> sp.
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Trtypauchen vagina</i>

Species list of macrobenthic animals collected from wet and dry season surveys

(B = both seasons; D = dry season; W = wet season)

Phylum	Class	Order	Family	Species	
Nemertinea				Nemertean spp.	B
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Chloeia flava</i>	W
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Linopherus paucibranchiata</i>	B
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Capitella</i> sp.	B
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus</i> sp.	B
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus</i> sp.	B
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.	B
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>	B
Annelida	Polychaeta	Eunicida	Dorvilleidae	<i>Schistomeringos rudolphi</i>	D
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>	B
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa sanguinea</i>	B
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>	B
Annelida	Polychaeta	Eunicida	Lumbrineriidae	<i>Lumbrineris nage</i>	B
Annelida	Polychaeta	Eunicida	Lumbrineriidae	<i>Lumbrineris shiinoi</i>	B
Annelida	Polychaeta	Eunicida	Onuphidae	<i>Onuphis eremita</i>	B
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina acuminata</i>	B
Annelida	Polychaeta	Opheliida	Scalibregmidae	<i>Scalibregma inflatum</i>	B
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Phylo ornatus</i>	B
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Paraonella</i> sp.	B
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania brevis</i>	B
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera chirori</i>	B
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>	B
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Ophiodromus angutifrons</i>	B
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Ophiodromus obscura</i>	W
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>	B
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>	B
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus sinensis</i>	B
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Leonnates persica</i>	B
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nectoneanthes alatopalpis</i>	B
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce</i> sp.	B
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Otopsis</i> sp.	B
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>	B
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Gattyana</i> sp.	W
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Harmothoe</i> sp.	B
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidasthenia</i> sp.	B
Annelida	Polychaeta	Phyllodocida	Sigalionidae	<i>Ehlersileanira hwanghaiensis</i>	B
Annelida	Polychaeta	Sabellida	Sabellidae	<i>Laonome indica</i>	D
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Cirriformia</i> sp.	B
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.	B
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona</i> sp.	B

Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus hystricosus</i>	B
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>	B
Annelida	Polychaeta	Spionida	Spionidae	<i>Minuspio cirrifera</i>	W
Annelida	Polychaeta	Spionida	Spionidae	<i>Paraprionospio pinnata</i>	B
Annelida	Polychaeta	Spionida	Spionidae	<i>Polydora</i> sp.	W
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio malmgreni</i>	B
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio saccifera</i>	B
Annelida	Polychaeta	Spionida	Spionidae	<i>Rhynchospio</i> sp.	W
Annelida	Polychaeta	Spionida	Spionidae	<i>Scolelepis squamata</i>	B
Annelida	Polychaeta	Spionida	Trochochaetidae	<i>Trochochaeta diverapoda</i>	B
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis scutata</i>	B
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Anobothrus</i> sp.	B
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana</i> sp.	B
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia bandera</i>	B
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia ingens</i>	B
Annelida	Polychaeta	Terebellida	Trichobranchidae	<i>Terebellides stroemii</i>	D
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>	B
Echiura	Echiurida	Echiuroinea	Echiuridae	<i>Thalassema sabinum</i>	D
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Mabellarca consociata</i>	W
Mollusca	Bivalvia	Lucinoida	Lucinidae	<i>Anodontia stearnsiana</i>	D
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Solidicorbula tunicata</i>	B
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Mactrinula dolabrata</i>	D
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Mactrinula reevesii</i>	D
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Angulus emarginatus</i>	W
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Macoma incongrua</i>	D
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Macoma praerupta</i>	B
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina iridella</i>	W
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina minuta</i>	B
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Dosinia derupta</i>	W
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Timoclea lionota</i>	W
Mollusca	Gastropoda	Mesogastropoda	Naticidae	<i>Polinices mammata</i>	W
Arthropoda	Malacostraca	Amphipoda		Amphipod spp.	B
Arthropoda	Malacostraca	Copepoda		Copepod spp.	B
Arthropoda	Malacostraca	Decapoda	Alpheidae	<i>Alpheus brevicristatus</i>	B
Arthropoda	Malacostraca	Decapoda	Alpheidae	<i>Alpheus distinguendus</i>	B
Arthropoda	Malacostraca	Decapoda	Callianassidae	<i>Callianassa japonica</i>	B
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Eucraste costata</i>	B
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Goneplax</i> sp.	W
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Typhlocarcinops canaliculata</i>	B
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Typhlocarcinops denticarpus</i>	B

Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Typhlocarcinus villosus</i>	B
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Xenopthalmus pinnotheroide</i>	B
Arthropoda	Malacostraca	Decapoda	Pasiphaeidae	<i>Leptochela aculeocaudata</i>	B
Arthropoda	Malacostraca	Decapoda	Penaeidae	<i>Metapenaeopsis barbata</i>	W
Arthropoda	Malacostraca	Decapoda	Penaeidae	<i>Miyadiella podophthalmus</i>	D
Arthropoda	Malacostraca	Decapoda	Pinnotheridae	<i>Neoxenopthalmus obscurus</i>	B
Arthropoda	Malacostraca	Decapoda	Porcellanidae	<i>Porcellanella triloba</i>	D
Arthropoda	Malacostraca	Decapoda	Porcellanidae	<i>Raphidopus ciliatus</i>	B
Arthropoda	Malacostraca	Decapoda	Portunidae	<i>Charybdis affinis</i>	D
Arthropoda	Malacostraca	Decapoda	Portunidae	<i>Charybdis hongkongensis</i>	W
Arthropoda	Malacostraca	Decapoda	Portunidae	<i>Charybdis natator</i>	W
Arthropoda	Malacostraca	Decapoda	Portunidae	<i>Charybdis variegata</i>	D
Arthropoda	Malacostraca	Decapoda	Processidae	<i>Processa japonica</i>	B
Arthropoda	Malacostraca	Decapoda		Shrimp larvae	W
Arthropoda	Malacostraca	Stomatopoda		Mantis shrimp larvae	W
Arthropoda	Malacostraca	Tanaidacea	Apeudidae	<i>Apeudes</i> sp.	D
Phoronida	Phoronidea		Phoronidae	<i>Phoronis</i> sp.	B
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphioplus laevis</i>	W
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphipholis squamata</i>	B
Echinodermata	Ophiuroidea	Gnathophiurida	Amphiuridae	<i>Amphiura hexactis</i>	B
Chordata	Amphioxi	Amphioxiformes	Amphioxidae	<i>Branchiostoma belcheri</i>	W
Chordata	Osteichthyes	Anguilliformes	Ophichthyidae	<i>Ophichthus</i> sp.	B
Chordata	Osteichthyes	Gadiformes	Bregmacerotidae	<i>Bregmaceros atlanticus</i>	W
Chordata	Osteichthyes	Gadiformes	Bregmacerotidae	<i>Bregmaceros maccllellandi</i>	W
Chordata	Osteichthyes	Perciformes	Gobiidae	<i>Ctenogobius brevirostris</i>	W
Chordata	Osteichthyes	Perciformes	Gobiidae	<i>Trypauchen vagina</i>	D
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Odontamblyopus</i> sp.	B

Abbreviations used in the data sheet

A	Cephalochordata, Amphioxi
C	Crustacea
E	Echinodermata
F	Chordata, Osteichthys (Fish)
M	Mollusca
N	Nemetea
P	Annelida, Polychaeta
Ph	Phoronida
S	Sipuncula

Station: B1 Season: Wet or Summer (Aug. 2006) Sampling date: 26/08/2006

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Linopherus paucibranchiata</i>							1	0.00			1	0.00
2	P	<i>Notomastus</i> sp.	1	0.02									1	0.02
3	P	<i>Cossurella dimorpha</i>										1	0.01	
4	P	<i>Marphysa stragulum</i>										1	0.06	
5	P	<i>Ophiodromus obscura</i>	1	0.00	1	0.00							2	0.00
6	P	<i>Lumbrineris shiinoi</i>	1	0.01					1	0.00	1	0.01	3	0.03
7	P	<i>Aglaophamus dibranchis</i>	1	0.01					1	0.00	2	0.00	6	0.03
8	P	<i>Prionospio saccifera</i>			1	0.00							1	0.00
9	P	<i>Loimia bandera</i>											1	0.07
10	P	<i>Trochochaeta diverapoda</i>	1	0.00									1	0.00
11	S	<i>Apionsoma trichocephalus</i>	2	0.01									2	0.01
12	N	Nemertean spp.	3	0.01	6	0.01	7	0.03	1	0.00			17	0.05
13	C	<i>Callianassa japonica</i>							3	0.06	1	0.02	6	0.08
14	C	Shrimp larvae	10	0.01	47	0.03	68	0.05	42	0.03	19	0.01	186	0.13
15	C	Amphipod spp.							1	0.00			1	0.00
16	M	<i>Nitidotellina minuta</i>							1	0.03			1	0.03
17	M	<i>Timoclea lionota</i>			1	0.14					1	0.02	2	0.15
18	F	<i>Odontamblyopus</i> sp.											1	0.21
Total			20	0.07	56	0.25	81	0.32	51	0.12	26	0.13	234	0.88

Station: B2 Season: Wet or Summer (Aug. 2006) Sampling date: 26/08/2006

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Anobothrus</i> sp.					1	0.00					1	0.00
2	P	<i>Chloëia flava</i>											1	16.12
3	P	<i>Notomastus</i> sp.					1	0.00					1	0.00
4	P	<i>Cirriiformia</i> sp.	12	0.06									15	0.85
5	P	<i>Tharyx</i> sp.	7	0.02	2	0.00	17	0.07	3	0.00	19	0.06	48	0.14
6	P	<i>Eunice indica</i>	4	0.01			1	0.00	2	0.02			7	0.03
7	P	<i>Marphysa sanguinea</i>	2	0.06			6	0.31	1	0.04			9	0.41
8	P	<i>Marphysa stragulum</i>	3	0.12	2	0.01	9	0.17	2	0.06	4	0.11	20	0.48
9	P	<i>Glycera chirori</i>	5	0.09			1	0.01	3	0.03	5	0.00	14	0.13
10	P	<i>Ophiodromus obscura</i>	3	0.00							1	0.00	4	0.00
11	P	<i>Lumbrineris shiinoi</i>					2	0.00			1	0.01	3	0.01
12	P	<i>Magelona</i> sp.	1	0.00							2	0.00	3	0.00
13	P	<i>Aglaophamus dibranchis</i>			1	0.00							1	0.00
14	P	<i>Aglaophamus sinensis</i>	1	0.00							1	0.00	2	0.01
15	P	<i>Nectoneanthes aiatopalpis</i>	3	0.00									3	0.00
16	P	<i>Leonnates persica</i>					1	0.00					1	0.00
17	P	<i>Onuphis eremita</i>			1	0.03	2	0.08	1	0.03	3	0.31	7	0.46
18	P	<i>Ophelina acuminata</i>					1	0.00					1	0.00
19	P	<i>Phylo ornatus</i>	1	0.00									1	0.00
20	P	<i>Paraonella</i> sp.	1	0.00			1	0.00					2	0.00
21	P	<i>Phyllodoce</i> sp.	1	0.00									1	0.00
22	P	<i>Poecilochaetus hystricosus</i>					1	0.01					1	0.01
23	P	<i>Gattyana</i> sp.	1	0.00									1	0.00
24	P	<i>Lepidasthenia</i> sp.	1	0.00			1	0.01	1	0.01			3	0.01
25	P	<i>Prionospio malmgreni</i>	6	0.01	1	0.00	13	0.01	8	0.01	6	0.00	34	0.03
26	P	<i>Laonice cirrata</i>									1	0.00	1	0.00
27	P	<i>Scolecopsis squamata</i>	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	4	0.00
28	P	<i>Amatea</i> sp.	3	0.03			14	0.31	6	0.12	3	0.02	26	0.47
29	P	<i>Loimia ingens</i>	1	0.01					3	0.13			4	0.14
30	P	<i>Paralacydonia paradoxaa</i>	1	0.00	1	0.00	1	0.00			1	0.00	4	0.00
31	S	<i>Apionsoma trichocephalus</i>	1	0.00			6	0.01	2	0.00	6	0.01	15	0.03
32	N	<i>Nemertean</i> spp.	2	0.01					1	0.01	3	0.10	6	0.13
33	Ph	<i>Phoronis</i> sp.			1	0.00							1	0.00
34	E	<i>Amphiura hexactis</i>					1	0.00					1	0.00
35	C	<i>Goneplax</i> sp.					1	0.02					1	0.02
36	C	<i>Raphidopus ciliatus</i>									1	0.01	1	0.01

Station: B3 Season: Wet or Summer (Aug. 2006) Sampling date: 26/08/2006

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Notomastus</i> sp.	1	0.34	1	0.00							1	0.34
2	P	<i>Mediomastus</i> sp.											1	0.00
3	P	<i>Cirriiformia</i> sp.	1	0.03					6	0.05			7	0.09
4	P	<i>Tharyx</i> sp.	1	0.00	1	0.00	2	0.00	2	0.01	1	0.01	7	0.02
5	P	<i>Eunice indica</i>							1	0.00			1	0.00
6	P	<i>Marphysa stragulum</i>	1	0.00	3	0.06	5	0.01	3	0.03	3	0.01	15	0.11
7	P	<i>Glycera chirori</i>	4	0.08	3	0.00			1	0.00			8	0.09
8	P	<i>Ophiodromus obscura</i>			3	0.00	2	0.00	1	0.00			6	0.00
9	P	<i>Lumbrineris nagae</i>					2	0.07					2	0.07
10	P	<i>Lumbrineris shiinoi</i>							2	0.00			2	0.00
11	P	<i>Magelona</i> sp.	2	0.00			1	0.00	1	0.00			4	0.00
12	P	<i>Euclymene</i> sp.	1	0.00									1	0.00
13	P	<i>Aglaophamus sinensis</i>					1	0.01			1	0.02	2	0.03
14	P	<i>Leonnates persica</i>			1	0.00			1	0.00			2	0.00
15	P	<i>Onuphis eremita</i>	1	0.11									1	0.11
16	P	<i>Paraonella</i> sp.	1	0.00									1	0.00
17	P	<i>Sigambra hanaokai</i>			1	0.00					2	0.00	3	0.00
18	P	<i>Poecilochaetus hystricosus</i>	1	0.00	1	0.00			1	0.00			3	0.00
19	P	<i>Lepidasthenia</i> sp.	1	0.03	1	0.01	1	0.00	4	0.04	1	0.01	8	0.09
20	P	<i>Prionospio malmgreni</i>	11	0.02	20	0.02	13	0.01	34	0.04	19	0.02	97	0.11
21	P	<i>Paraprionospio pinnata</i>									1	0.00	1	0.00
22	P	<i>Scolecopsis squamata</i>									2	0.00	2	0.00
23	P	<i>Amaeana</i> sp.			5	0.18	5	0.14	8	0.18	5	0.11	23	0.60
24	P	<i>Loimia ingens</i>	2	0.01							1	0.04	3	0.05
25	P	<i>Paralacydonia paradoxa</i>					2	0.00					2	0.00
26	S	<i>Apionsoma trichocephalus</i>			5	0.00	1	0.00	2	0.00	2	0.00	8	0.01
27	N	Nemertean spp.	1	0.00	2	0.00			1	0.00			4	0.01
28	E	<i>Amphioptus laevis</i>					1	0.00					1	0.00
29	E	<i>Amphiura hexactis</i>					1	0.02	1	0.00			2	0.02
30	C	<i>Charybdis natator</i>							1	0.03			1	0.03
31	C	<i>Goneplax</i> sp.									1	0.01	1	0.01
32	C	<i>Neoxenophthalmus obscurus</i>	1	0.11					1	0.02			2	0.13
33	C	<i>Typhlocarcinops canaliculata</i>							2	0.11			2	0.11
34	C	<i>Typhlocarcinops denticarpus</i>			1	0.06							1	0.06
35	C	<i>Typhlocarcinus villosus</i>			2	1.30							2	1.30
36	C	<i>Xenophthalmus pinnotheroides</i>			1	0.07		0.02			2	0.14	4	0.23

Station: B4

Season: Wet or Summer (Aug. 2006)

Sampling date: 26/08/2006

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Mediomastus</i> sp.					1	0.00	1	0.00			2	0.00
2	P	<i>Bhawania brevis</i>			1	0.00							1	0.00
3	P	<i>Cirriformia</i> sp.									1	0.00	1	0.00
4	P	<i>Tharyx</i> sp.					1	0.00					1	0.00
5	P	<i>Cossurella dimorpha</i>			1	0.00					1	0.00	2	0.00
6	P	<i>Glycinde gurjanovae</i>	1	0.01									1	0.01
7	P	<i>Ophiodromus angutifrons</i>			1	0.00							1	0.00
8	P	<i>Lumbrineris nagae</i>					1	0.03					1	0.03
9	P	<i>Magelona</i> sp.	1	0.00									1	0.00
10	P	<i>Aglaophamus dibranchis</i>	1	0.01	2	0.00	2	0.00	3	0.00	1	0.00	9	0.02
11	P	<i>Paraonella</i> sp.					1	0.00					1	0.00
12	P	<i>Sigambra hanaokai</i>							1	0.00			1	0.00
13	P	<i>Prionospio saccifera</i>							1	0.00			1	0.00
14	P	<i>Minuspio cirrifera</i>									1	0.00	1	0.00
15	P	<i>Sternaspis sculata</i>			1	0.01							1	0.01
16	P	<i>Loimia bandera</i>			1	0.01	9	0.02	1	0.00	2	0.01	13	0.03
17	P	<i>Paralacydonia paradoxa</i>									1	0.00	1	0.00
18	S	<i>Apionsoma trichocephalus</i>	10	0.01	11	0.02	9	0.02	10	0.02	4	0.01	44	0.08
19	N	<i>Nemertean</i> spp.	3	0.00	3	0.00					3	0.00	9	0.01
20	Ph	<i>Phoronis</i> sp.					6	0.00			8	0.00	14	0.00
21	E	<i>Amphiura hexactis</i>									2	0.00	2	0.00
22	C	<i>Eucrate costata</i>	1	0.05									1	0.05
23	C	<i>Typhlocarcinops canaliculata</i>			1	0.03							1	0.03
24	C	<i>Alpheus brevicristatus</i>									1	0.00	1	0.00
25	C	<i>Callinassa japonica</i>					1	0.02			1	0.01	2	0.03
26	C	<i>Leptochela aculeocaudata</i>	1	0.04									1	0.04
27	C	<i>Amphipod</i> spp.							2	0.01			2	0.01
28	C	<i>Copepod</i> spp.			3	0.00					5	0.00	8	0.00
29	M	<i>Dosinia derupta</i>	1	0.91									1	0.91
30	M	<i>Nitidotellina minuta</i>			1	0.01							1	0.01
31	M	<i>Solidicorbula tunicata</i>	2	6.35									2	6.35
32	F	<i>Bregmarceros macclellandi</i>			1	0.02							1	0.02
33	F	<i>Odontamblyopus</i> sp.	1	0.11			1	0.03					2	0.14
34	F	<i>Ophichthus</i> sp.	1	0.72									1	0.72
	Total		23	8.20	27	0.10	32	0.12	19	0.03	31	0.04	132	8.50

Jo	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Anobothrus</i> sp.	1	0.00							1	0.00	2	0.00
2	P	<i>Mediomastus</i> sp.									2	0.01	2	0.01
3	P	<i>Cirriiformia</i> sp.			1	0.00							1	0.00
4	P	<i>Tharyx</i> sp.					1	0.00					1	0.00
5	P	<i>Cossurella dimorpha</i>	4	0.03	1	0.00			1	0.00			1	0.00
6	P	<i>Magelona</i> sp.	1	0.00	1	0.02			1	0.00			7	0.03
7	P	<i>Aglaophamus dibranchis</i>	3	0.00			1	0.00			3	0.00	7	0.00
8	P	<i>Aglaophamus sinensis</i>	1	0.00							1	0.00	2	0.00
9	P	<i>Phylodoce</i> sp.					1	0.00					1	0.00
0	P	<i>Poecilochaetus hystricosus</i>					1	0.00					1	0.00
1	P	<i>Gattyana</i> sp.					1	0.00					1	0.00
2	P	<i>Prionospio saccifera</i>	1	0.00			1	0.00			1	0.00	3	0.00
3	P	<i>Laonice cirrata</i>							1	0.04			1	0.04
4	P	<i>Parapionospio pinnata</i>							1	0.00			2	0.00
5	P	<i>Rhynchospio</i> sp.	3	0.01									4	0.02
6	P	<i>Sternaspis scutata</i>	1	0.02			3	0.02					4	0.03
7	P	<i>Amaeana</i> sp.									1	0.00	1	0.00
8	P	<i>Paralacydonia paradoxa</i>	1	0.00	1	0.00							3	0.00
9	S	<i>Apionsoma trichocephalus</i>	14	0.03	6	0.01					3	0.01	32	0.06
0	N	<i>Nemertean</i> spp.	2	0.00	2	0.00					1	0.01	5	0.01
1	Ph	<i>Phoronis</i> sp.			1	0.00	2	0.00					3	0.00
2	E	<i>Amphiura hexactis</i>	1	0.00									1	0.00
3	C	<i>Typhlocarcinops canaliculata</i>			1	0.06							1	0.06
4	C	<i>Callianassa japonica</i>					2	0.04			2	0.13	4	0.18
5	C	<i>Mantis shrimp larvae</i>	1	0.00									1	0.00
6	C	<i>Copepod</i> spp.	27	0.01	15	0.00							51	0.01
7	F	<i>Bregmarceros macclellandi</i>			2	0.01							3	0.01
8	F	<i>Ctenogobius brevirostris</i>									1	1.90	1	1.90
9	F	<i>Odontamblyopus</i> sp.	1	0.08									1	0.08
Total			62	0.19	30	0.10	34	0.10	6	0.18	16	1.92	148	2.49

Station: B7

Season: Wet or Summer (Aug. 2006)

Sampling date: 26/08/2006

No	Groups	Species	A		B		C		D		E		Total		
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)	
1	P	<i>Anobothrus</i> sp.					1	0.00				1	0.00	2	0.00
2	P	<i>Linopherus paucibranchiata</i>										2	0.18	2	0.18
3	P	<i>Capitella</i> sp.	1	0.00										1	0.00
4	P	<i>Tharyx</i> sp.												4	0.01
5	P	<i>Cossurella dimorpha</i>			1	0.01								2	0.01
6	P	<i>Glycinde guirjanovae</i>	1	0.00										1	0.00
7	P	<i>Ophiodromus anguifrons</i>												1	0.00
8	P	<i>Lumbrineris shiinoi</i>	1	0.00										1	0.00
9	P	<i>Magelona</i> sp.	2	0.03										2	0.00
10	P	<i>Aglaophamus dibranchis</i>	3	0.02	1	0.00	7	0.01	2	0.00	2	0.00	15	0.04	
11	P	<i>Phylo ornatus</i>												1	0.01
12	P	<i>Sigambra hanaokai</i>					2	0.00						2	0.00
13	P	<i>Prionospio saccifera</i>	1	0.00			1	0.00	1	0.00				4	0.01
14	P	<i>Paraprionospio pinnata</i>	1	0.00	1	0.00								2	0.00
15	P	<i>Rhynchospio</i> sp.	1	0.00	1	0.00	4	0.02				5	0.01	11	0.04
16	P	<i>Sternaspis scutata</i>					1	0.01						1	0.01
17	P	<i>Loimia bandera</i>	1	0.02	1	0.00								2	0.03
18	S	<i>Apionsoma trichocephalus</i>	10	0.02	5	0.02	8	0.03	9	0.03		8	0.03	40	0.12
19	N	Nemertean spp.	1	0.00	1	0.01	4	0.01	2	0.00		2	0.00	10	0.02
20	Ph	<i>Phoronis</i> sp.					1	0.00	1	0.00		1	0.00	3	0.00
21	E	<i>Amphiura hexactis</i>	1	0.01										1	0.01
22	C	<i>Typhlocarcinops canaliculata</i>			1	0.03			1	0.09				2	0.12
23	C	<i>Alpheus brevicristatus</i>	1	0.00										1	0.00
24	C	<i>Callinassa japonica</i>	1	0.00	1	0.01	1	0.01	1	0.02		1	0.01	5	0.06
25	C	<i>Metapenaeopsis barbata</i>										1	1.04	1	1.04
26	C	<i>Leptochela aculeocaudata</i>			2	0.05								2	0.05
27	C	Copepod spp.	3	0.00										12	0.00
28	M	<i>Angulus emarginatus</i>										5	0.00	12	0.00
29	F	<i>Bregmarceros atlanticus</i>			1	0.11			1	1.60				1	1.60
30	F	<i>Bregmarceros maccllellandi</i>					1	0.01						1	0.11
31	F	<i>Odontamblyopus</i> sp.					1	0.02	1	0.07		1	0.08	3	0.17
Total			29	0.12	16	0.26	36	0.12	24	1.81	33	1.36	138	3.67	

lo	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Anobothrus</i> sp.	1	0.00									1	0.00
2	P	<i>Mediomastus</i> sp.					2	0.00	4	0.01			2	0.00
3	P	<i>Bhawania brevis</i>			1	0.00			1	0.00			1	0.00
4	P	<i>Tharyx</i> sp.			2	0.00							1	0.00
5	P	<i>Cossurella dimorpha</i>			1	0.00			1	0.00			1	0.00
6	P	<i>Ophiodromus angutifrons</i>			1	0.00							1	0.00
7	P	<i>Lumbrineris shiinoi</i>							1	0.00			1	0.00
8	P	<i>Magelona</i> sp.	1	0.00					1	0.00			1	0.00
9	P	<i>Aglaophamus dibranchis</i>	2	0.01	1	0.06	2	0.00	9	0.01	1	0.00	3	0.00
10	P	<i>Aglaophamus sinensis</i>	1	0.02									14	0.08
11	P	<i>Onuphis eremita</i>					1	0.14					1	0.02
12	P	<i>Sigambra hanaokai</i>							1	0.00			1	0.14
13	P	<i>Otopsis</i> sp.							1	0.00			1	0.00
14	P	<i>Ehlersiellanira hwanghaiensis</i>					1	0.11					1	0.00
15	P	<i>Rhynchospio</i> sp.	4	0.01	2	0.00	2	0.00			1	0.00	7	0.11
16	P	<i>Sternaspis scutata</i>							2	0.03			2	0.02
17	P	<i>Loimia bandera</i>			1	0.00							1	0.03
18	P	<i>Paralacydonia paradoxa</i>							2	0.00			2	0.00
19	S	<i>Apionsoma trichocephalus</i>					4	0.01	14	0.03			18	0.06
20	N	Nemertean spp.	1	0.00	2	0.01	4	0.01	3	0.00	2	0.00	12	0.10
21	Ph	<i>Phoronis</i> sp.	4	0.00	2	0.00	1	0.00			2	0.00	9	0.02
22	E	<i>Amphiura hexactis</i>					1	0.01			1	0.00	2	0.00
23	C	<i>Typhlocarcinops denticarpus</i>									1	0.08	1	0.01
24	C	<i>Xenophthalmus pinnotheroides</i>					1	0.24			1	0.08	1	0.08
25	C	<i>Alpheus brevicristatus</i>	2	0.01			1	0.05					3	0.24
26	C	<i>Callinassa japonica</i>	2	0.02			1	0.01			4	0.06	7	0.06
27	C	Mantis shrimp larvae	1	0.01			1	0.02					2	0.08
28	C	Amphipod spp.											2	0.02
29	C	Copepod spp.									1	0.00	1	0.00
30	M	<i>Mabellarca consociata</i>									10	0.00	10	0.00
31	M	<i>Polinices mammata</i>	1	0.51							1	1.20	2	1.71
32	F	<i>Ophichthus</i> sp.					1	2.67					1	2.67
	Total		20	0.59	13	2.79	23	1.02	40	0.08	45	1.41	141	5.90

Abbreviations used in the data sheet

C	Crustacea
E	Echinodermata
Ec	Echiura
F	Chordata, Osteichthys (Fish)
M	Mollusca
N	Nemertea
P	Annelida, Polychaeta
Ph	Phoronida
S	Sipuncula

Station: B1

Season: Dry or Winter (Jan. 2007)

Sampling date: 16/01/2007

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Linopherus paucibranchiata</i>			1	0.00							1	0.00
2	P	<i>Mediomastus</i> sp.			1	0.00							1	0.00
3	P	<i>Cossurella dimorpha</i>					1	0.00					1	0.00
4	P	<i>Lumbrineris shiinoi</i>	1	0.01									3	0.02
5	P	<i>Aglaophamus dibranchis</i>							1	0.00			2	0.01
6	P	<i>Sigambra hanaokai</i>			1	0.00							1	0.00
7	P	<i>Prionospio saccifera</i>											1	0.01
8	P	<i>Loimia bandera</i>					1	0.00					1	0.00
9	S	<i>Apionsoma trichocephalus</i>					2	0.01					2	0.01
10	N	Nemertean spp.	1	0.00	1	0.00	1	0.00					3	0.00
11	E	<i>Amphiura hexactis</i>					1	0.01					1	0.01
12	C	<i>Typhlocarcinops canaliculata</i>			1	0.07							1	0.07
13	C	<i>Callianassa japonica</i>					1	0.00					1	0.00
14	C	Amphipod spp.							1	0.00			1	0.00
	Total		2	0.01	5	0.07	7	0.03	2	0.00	4	0.02	20	0.14

Station: B2 Season: Dry or Winter (Jan. 2007) Sampling date: 16/01/2007

No	Groups	Species	A		B		C		D		E		Total		
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)	
1	P	<i>Anobothrus</i> sp.					1	0.00				2	0.00	3	0.00
2	P	<i>Linopherus paucibranchiata</i>			1	0.01								1	0.01
3	P	<i>Tharyx</i> sp.	1	0.00			2	0.00	8	0.02				11	0.03
4	P	<i>Eunice indica</i>			1	0.02	2	0.04	5	0.06				8	0.12
5	P	<i>Marphysa sanguinea</i>			2	0.12			4	0.08				6	0.20
6	P	<i>Marphysa stragulum</i>										1	0.04	1	0.04
7	P	<i>Glycera chirori</i>	2	0.05			3	0.07	4	0.02	1	0.07	10	0.21	
8	P	<i>Ophiodromus angulifrons</i>			2	0.00								2	0.00
9	P	<i>Lumbrineris nagae</i>	1	0.02			2	0.00						3	0.02
10	P	<i>Magelona</i> sp.					2	0.01	1	0.00				3	0.01
11	P	<i>Euclymene</i> sp.			1	0.04								1	0.04
12	P	<i>Aglaophamus sinensis</i>	1	0.01										1	0.01
13	P	<i>Nectoneanthes alatopalpis</i>			3	0.00	5	0.01	2	0.00	1	0.00	11	0.02	
14	P	<i>Onuphis eremita</i>			1	0.03	1	0.07						2	0.10
15	P	<i>Phylo ornatus</i>					1	0.00						1	0.00
16	P	<i>Phyllodoce</i> sp.	2	0.01										2	0.01
17	P	<i>Poecilochaetus hystricosus</i>	3	0.02	2	0.00	1	0.01						6	0.03
18	P	<i>Harmothoe</i> sp.			1	0.00	1	0.00	3	0.01				5	0.01
19	P	<i>Lepidasthenia</i> sp.			1	0.02								1	0.02
20	P	<i>Laonome indica</i>												1	0.00
21	P	<i>Scalibregma inflatum</i>							1	0.00				1	0.00
22	P	<i>Ehlersileanira hwanghaiensis</i>					2	0.04						2	0.04
23	P	<i>Prionospio malmgreni</i>	3	0.01			8	0.02	4	0.01	1	0.03	16	0.07	
24	P	<i>Laonice cirrata</i>			1	0.02	2	0.01						3	0.03
25	P	<i>Scolecopsis squamata</i>					1	0.00						1	0.00
26	P	<i>Sternaspis sculata</i>	1	0.01										1	0.01
27	P	<i>Loimia ingens</i>	3	0.71			1	0.02	2	0.03				6	0.76
28	P	<i>Loimia bandera</i>			1	0.45								1	0.45
29	P	<i>Terebellides stroemii</i>	1	0.00					1	0.00				2	0.01
30	P	<i>Trochochaeta diverapoda</i>	1	0.18										1	0.18
31	P	<i>Paralacydonia paradoxa</i>	1	0.00	2	0.00								3	0.00
32	S	<i>Apionsoma trichocephalus</i>	1	0.00			8	0.01	6	0.00	1	0.00	16	0.02	

Station: B4 Season: Dry or Winter (Jan. 2007) Sampling date: 16/01/2007

No	Groups	Species	A		B		C		D		E		Total		
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)	
1	P	<i>Mediomastus</i> sp.										2	0.00	2	0.00
2	P	<i>Tharyx</i> sp.	1	0.00										1	0.00
3	P	<i>Cossurella dimorpha</i>			1	0.00			1	0.01				2	0.01
4	P	<i>Glycera chironi</i>	1	0.09										1	0.09
5	P	<i>Lumbrineris nagae</i>			2	0.09								2	0.09
6	P	<i>Magelona</i> sp.	2	0.01	1	0.02								3	0.03
7	P	<i>Aglaophamus dibranchis</i>	3	0.00					1	0.00	4	0.01		8	0.01
8	P	<i>Leonnates persica</i>							1	0.00				1	0.00
9	P	<i>Phylo ornatus</i>			1	0.00					1	0.00		2	0.00
10	P	<i>Harmothoe</i> sp.	1	0.00										1	0.00
11	P	<i>Prionospio malmgreni</i>	1	0.00										1	0.00
12	P	<i>Prionospio saccifera</i>			1	0.01								3	0.02
13	S	<i>Apionsoma trichocephalus</i>	8	0.00	7	0.02	10	0.02	9	0.00	3	0.00	37	0.04	
14	N	<i>Nemertean</i> spp.			2	0.02			1	0.00	3	0.00	6	0.03	
15	E	<i>Amphiura hexactis</i>							1	0.00				1	0.00
16	C	<i>Xenopthalmus pinnotheroides</i>			2	0.49								2	0.49
17	C	<i>Alpheus distinguendus</i>	2	0.27							1	0.18		3	0.45
18	C	<i>Callinassa japonica</i>	4	0.02	2	0.03	2	0.01	3	0.01	1	0.00	12	0.08	
19	A	<i>Amphipod</i> spp.			2	0.00	2	0.00	1	0.00			3	0.00	
	Total		23	0.39	18	0.68	17	0.04	18	0.04	15	0.19	91	1.35	

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Tharyx</i> sp.					1	0.00					1	0.00
2	P	<i>Cossurella dimorpha</i>	1	0.01			1	0.02			1	0.02	3	0.05
3	P	<i>Schistomerings rudolphi</i>			1	0.00							1	0.00
4	P	<i>Lumbrinereis nagae</i>							1	0.05			1	0.05
5	P	<i>Lumbrinereis shiinoi</i>	1	0.00									1	0.00
6	P	<i>Aglaohamys dibranchis</i>			2	0.00	1	0.01	1	0.00			4	0.01
7	P	<i>Leonnates persica</i>					1	0.02					1	0.02
8	P	<i>Phylo ornatus</i>					1	0.00					1	0.00
9	P	<i>Paraonella</i> sp.	1	0.00			1	0.00					2	0.00
10	P	<i>Sigambra hanaokai</i>							1	0.00			1	0.00
11	P	<i>Ehlersleanira hwanghaiensis</i>											1	0.00
12	P	<i>Prionospio saccifera</i>			1	0.00	1	0.00			2	0.01	3	0.01
13	P	<i>Laonice cirrata</i>							3	0.32			3	0.32
14	P	<i>Paraprionospio pinnata</i>											1	0.00
15	P	<i>Sternaspis sculata</i>			1	0.02							3	0.02
16	S	<i>Apionsoma trichocephalus</i>	10	0.03	19	0.04	26	0.05	19	0.04	9	0.02	83	0.18
17	N	Nemertean spp.	5	0.01	1	0.01	1	0.00	2	0.01	1	0.00	10	0.03
18	Ph	<i>Phoronis</i> sp.	1	0.00					1	0.00			2	0.00
19	E	<i>Amphiura hexactis</i>			2	0.01							2	0.01
20	C	<i>Xenopthalmus pinnotheroides</i>							1	0.09	1	0.16	2	0.26
21	C	<i>Caillanassa japonica</i>	3	0.02	2	0.01	1	0.01	1	0.00	3	0.01	10	0.06
22	C	<i>Leptochela aculeocaudata</i>	2	0.03									2	0.03
23	C	<i>Amphipod</i> spp.	1	0.00					1	0.00			2	0.00
24	M	<i>Macrinula dolabrata</i>							1	4.80			1	4.80
25	F	<i>Odontamblyopus</i> sp.	1	0.21	1	1.59							2	1.80
26	F	<i>Trypauchen vagina</i>			1	0.17							1	0.17
Total			26	0.31	31	1.85	35	0.12	34	5.32	18	0.22	144	7.83

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Notomastus</i> sp.	1	0.11									1	0.11
2	P	<i>Mediomastus</i> sp.			1	0.00	1	0.31					1	0.31
3	P	<i>Bhawania brevis</i>	1	0.00									1	0.00
4	P	<i>Tharyx</i> sp.	1	0.00									1	0.00
5	P	<i>Cossurella dimorpha</i>	1	0.00	1	0.00				1	0.01		3	0.02
6	P	<i>Glycinde gurjanovae</i>	1	0.00	1	0.00							1	0.00
7	P	<i>Lumbrineris shiinoi</i>	1	0.00									1	0.00
8	P	<i>Magelona</i> sp.	1	0.04				0.01					2	0.05
9	P	<i>Euclymene</i> sp.	1	0.05									1	0.05
10	P	<i>Aglaophamus dibranchis</i>	4	0.01					1	0.00			5	0.01
11	P	<i>Paraonella</i> sp.			1	0.00							1	0.00
12	P	<i>Otopsis</i> sp.	1	0.00									1	0.00
13	P	<i>Laonice cirrata</i>											1	0.13
14	P	<i>Loimia bandera</i>	1	0.01					2	0.12			1	0.13
15	S	<i>Apionsoma trichocephalus</i>	12	0.02	13	0.02	5	0.01	3	0.01			41	0.08
16	N	<i>Nemertean</i> spp.	1	0.00			1	0.01					2	0.01
17	Ph	<i>Phoronis</i> sp.	1	0.00									2	0.00
18	E	<i>Amphiura hexactis</i>			2	0.02							3	0.02
19	C	<i>Typhlocarcinops denticarpus</i>											1	0.07
20	C	<i>Alpheus distinguendus</i>	1	0.45	1	0.16							2	0.60
21	C	<i>Callianassa japonica</i>	1	0.00	4	0.08	2	0.02	2	0.03			10	0.14
22	C	<i>Amphipod</i> spp.	1	0.00	1	0.00							2	0.00
23	C	<i>Copepod</i> spp.	5	0.00			1	0.00					8	0.00
24	F	<i>Odontamblyopus</i> sp.							1	0.11			1	0.11
Total			35	0.69	25	0.28	11	0.37	9	0.26	18	0.24	98	1.84

Station: B7

Season: Dry or Winter (Jan. 2007)

Sampling date: 16/01/2007

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Mediomastus</i> sp.			1	0.00							1	0.00
2	P	<i>Cossurella dimorpha</i>	1	0.00	1	0.00				1	0.00		3	0.01
3	P	<i>Glycera chironi</i>	1	0.05			1	0.00					2	0.05
4	P	<i>Lumbrineris nagae</i>			1	0.15							1	0.15
5	P	<i>Magelona</i> sp.			1	0.01							1	0.01
6	P	<i>Aglaophamus dibranchis</i>	1	0.00	1	0.00	2	0.00		1	0.00		5	0.01
7	P	<i>Phylo ornatus</i>	1	0.00									1	0.00
8	P	<i>Phyllodoce</i> sp.			1	0.00	1	0.00	1	0.02			3	0.02
9	P	<i>Harmothoe</i> sp.			1	0.00							1	0.00
10	P	<i>Sternaspis sculata</i>	1	0.02									1	0.02
11	S	<i>Apionsoma trichocephalus</i>	6	0.02	17	0.05	11	0.01		8	0.02	7	49	0.12
12	N	Nemertean spp.	2	0.02	3	0.01	1	0.00	2	0.05	2	0.00	10	0.08
13	E	<i>Amphiura hexactis</i>	2	0.01									2	0.01
14	C	<i>Callianassa japonica</i>	3	0.04	3	0.02	5	0.02	2	0.03	4	0.04	17	0.16
15	C	<i>Leptochela aculeocaudata</i>			1	0.01					2	0.04	3	0.05
16	C	Amphipod spp.									1	0.00	1	0.00
17	F	<i>Odontamblyopus</i> sp.			1	0.16							1	0.16
Total			18	0.15	31	0.26	22	0.19	13	0.13	18	0.11	102	0.84

Station: B8

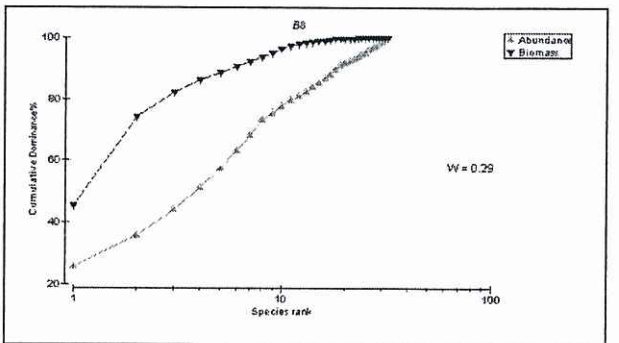
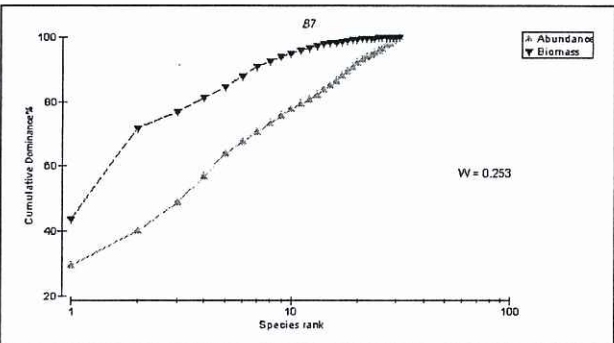
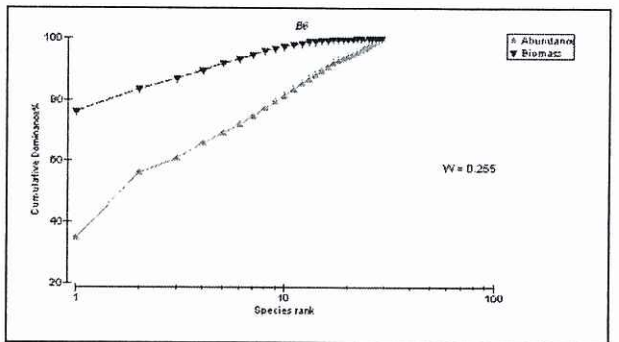
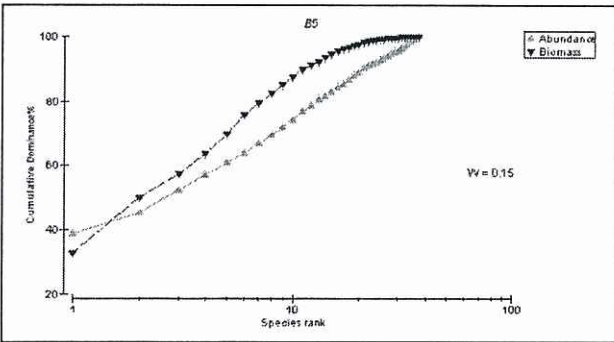
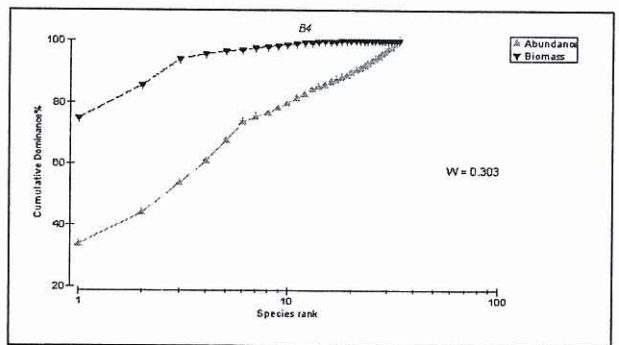
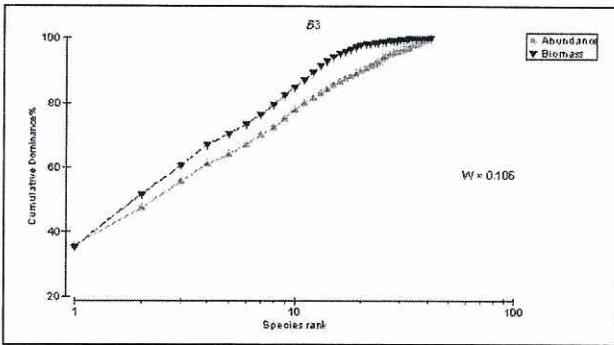
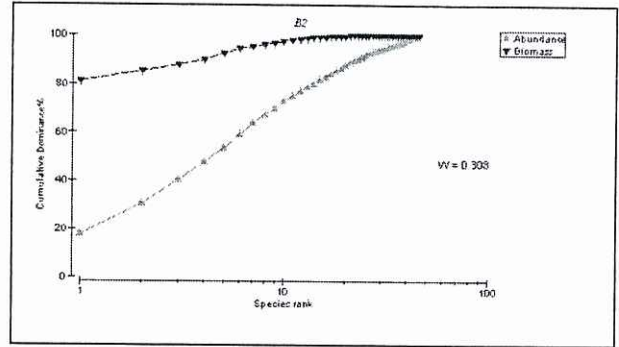
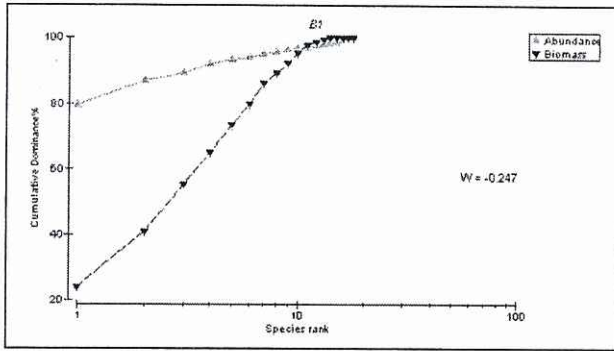
Season: Dry or Winter (Jan. 2007)

Sampling date: 16/01/2007

No	Groups	Species	A		B		C		D		E		Total	
			Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.1m ²)	Wet wt. (g/0.1m ²)	Ind. (0.5m ²)	Wet wt. (g/0.5m ²)
1	P	<i>Mediomastus</i> sp.	1	0.00									1	0.00
2	P	<i>Cossurella dimorpha</i>												
3	P	<i>Schistomeringos rudolphii</i>												
4	P	<i>Glycera chirori</i>			1	0.84							1	0.84
5	P	<i>Lumbrineris nagae</i>												
6	P	<i>Magelona</i> sp.												
7	P	<i>Aglaophamus dibranchis</i>	1	0.00	1	0.00	1	0.00	2	0.00	1	0.00	4	0.00
8	P	<i>Leonnates persica</i>											4	0.00
9	P	<i>Otopsis</i> sp.											1	0.00
10	P	<i>Prionospio saccifera</i>			1	0.00							1	0.00
11	P	<i>Sternaspis sculata</i>	1	0.00									1	0.00
12	P	<i>Paralacydonia paradoxa</i>											1	0.00
13	S	<i>Apionsoma trichocephalus</i>	2	0.00	14	0.02	1	0.00	24	0.06	11	0.04	70	0.16
14	N	<i>Nemertean</i> spp.	2	0.28			1	0.00			2	0.00	5	0.29
15	E	<i>Amphiura hexactis</i>	3	0.00							2	0.01	5	0.02
16	C	<i>Xenophthalmus pinnotheroides</i>	1	0.09			1	0.09	2	0.28			4	0.46
17	C	<i>Alpheus brevicristatus</i>	1	0.03									1	0.03
18	C	<i>Callinassa japonica</i>			3	0.03	2	0.01					5	0.04
19	C	<i>Miyadiella podophthalmus</i>			1	0.03							1	0.03
20	C	<i>Amphipod</i> spp.					1	0.00	4	0.00			5	0.00
21	M	<i>Solidicorbula tunicata</i>											1	4.27
22	F	<i>Odontamblyopus</i> sp.											1	0.20
Total			12	0.41	20	0.08	30	0.98	35	0.54	21	4.89	118	6.89

Annex 3
Plots of Abundance and Biomass Comparison (ABC) of Faunal Data

Wet season survey



Dry season survey

