Vancouver Harbour and Burrard Inlet Benthic Infaunal Sampling Program, October 1987

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We wish to acknowledge the assistance of the officers and crew of the CSS Vector, and the helpful cooperation of D. Goyette and J. Boyd (EPS), who gave us access to unpublished data. D. Moore assisted with all aspects of the cruise and performed the sorting and sediment analyses.

ABSTRACT

Burd, B. J. and R. O. Brinkhurst. 1990. Vancouver Harbour benthic infaunal sampling program, October 1987. Can. Tech. Rep. Hydrogr. Ocean Sci. 122 : 49p.

Environment Canada (Environmental Protection Service - EPS) is engaged in an overall assessment of the environmental status of Vancouver Harbour, British Columbia. The Ocean Ecology Division of the Institute of Ocean Sciences contributed a study of the macrobenthic infauna in October of 1987. Using cluster analyses in conjunction with recently developed statistical inferential techniques, the grouping of stations based on similarity was examined for the species abundance data, depth data, sediment composition data and for sediment chemistry data. Station clusters based on abundance data were examined for statistical significance, then compared with station groups based on the environmental data.

Abundances and species richness were generally lower in the eastern harbour (Port Moody Arm) than in the inner harbour, suggesting at first glance that the eastern harbour may be more severely affected by anthropogenic factors than the inner harbour. Three stations in the eastern harbour were almost defaunate. No immediately obvious reason can be suggested for this. The statistically significant clusters of stations based on the relative abundance data were coherent geographically.

The station patterns based on species abundance data bore little resemblance to the depth and sediment reference data, except in the separation of stations into inner versus eastern harbour groups. The sediment chemistry data were statistically more significantly related to the abundance data than either depth or sediment composition.

Keywords: Vancouver Harbour, benthos, environmental impact.

Resumé

Burd, B.J. and R.O. Brinkhurst. 1990. Vancouver Harbour benthic infaunal sampling program, October 1987. Can. Tech. Rep. Hydrogr. Ocean Sci. 122: 49p.

Le ministére de l'Environnement du Canada (Service de la protection de l'environnnement) a entrepris une evaluation globale de l'environnement dans le port de Vancouver, en Colombie- Britannique. Dans le cadre de ce programme d'évaluation, la Division de l'écologie des océans de l'Institut des sciences de la mer a effectué une étude portant sur l'endofauna du port en octobre 1987. Au moyen d'analyses de grappes et de nouvelles techniques d'inférance statistique, les stations d'échantillonnage ont été groupées selon leur similitude au regard des paramètres suivants : abondance des espéces, profondeur, types de sédiments et composition chimique des sédiments. Nous avons analysé les grappes de stations fondées sur l'abondance pour voir si elles montraient des différences statistiques significatives et nous les avons comparées aux grappes de stations fondées sur les données environnementales.

L'endofaune du port intérieur était plus abondants et comportait un plus grand nombre d'espèces que celle de la partie est du port (bras Port Moody). À première vue, cela semble indiquer que la partie est du port serait d'avantage touchée par des facteurs anthropiques que le port intérieur. De fait, l'endofaune était presque inexistante à trois stations de la partie est. Les causes de cette situation ne sont pas évidentes pour l'instant. Les grappes de stations fondées sur l'abondance et montraint des différences statistiques significatives avaient une distribution geographique cohérente.

Les données relatives aux sédiments et aux profondeurs étaient faiblement corrélées aux résultats du traitement des stations selon l'abondance des espèces, sauf si les stations étaient divisées en groupes du port intérieur d'une part, et de la partie est du port, d'autre part. La relation statistique entre les données de composition chimique des sédiments et les données d'abondance était plus significative que celle entre ces dernières et la profondeur ou les types de sédiments.

Mots clés : port de Vancouver, benthos, impact environnemental.

INTRODUCTION

Environment Canada (Environmental Protection Service - EPS) is engaged in an overall assessment of the environmental status and health of Vancouver Harbour, British Columbia. The Ocean Ecology Division of the Institute of Ocean Sciences contributed a study of the macrobenthic infauna. Samples were taken at stations for which EPS has studied sediment chemistry and epibenthic macrofauna. This report details the results of the benthic infaunal portion of that study, and includes initial pattern analyses of populations with respect to some natural and anthropogenic environmental factors. The report includes a preliminary examination of the effects of some sediment chemistry factors on benthic community structure. This chemical data is cited from Goyette and Boyd (1989).

METHODS

BENTHIC FAUNAL SAMPLING

Benthic infauna were sampled in Vancouver Harbour from October 26 to 30, 1987 at 28 selected stations (see Table 1 and Figure 1). One station was sampled in the outer harbour (PEI= Pacific Environment Institute, West Vancouver Laboratory), 16 stations were sampled in the inner harbour (1 to 25e), and 11 stations were sampled in the eastern harbour (Port Moody arm - 36b to 46). Samples were collected using a 23 cm square ponar grab. Two replicate samples were taken at each station. A 100ml corer was inserted into one of the replicate grabs before opening, (for sediment particle size analysis) and the remaining sediment was washed carefully with seawater through a 0.3mm screen. The seawater was initially filtered through a 0.25mm screen. Animals and particles retained were preserved in 10% buffered, Rose Bengal stained, formalin for preservation and transport to the laboratory.

SORTING AND IDENTIFICATION

In the laboratory, samples were again washed through a 0.3mm screen and sorted. In some cases, large amounts of debris necessitated sorting of only 1/3 or 1/4 of the sample. The few samples so treated were split using a large Folsom plankton splitter. The reliability of this subsampling method was subsequently tested by subsampling with replacement for a series of different substrate types. Extrapolated counts from subsamples were not significantly different from total counts for the whole samples. Detailed data and results from this sampling experiment are available elsewhere (Cross 1989). After sorting, 10% of the samples were sorted again to find leftover animals. The quality control results are summarized in Appendix A. Detection of less than an additional 5% of the total number of organisms reported in the original count is deemed acceptable, otherwise the samples would all be resorted. All of the animals sorted were preserved

Table 1. Vancouver Harbour sampling dates and locations, October, 1987.

Station	Latitude	Longitude	Depth(m)	Date	Time (PDT)
PEI	49 19.78	123 13.97	67	Oct 26/87	1540
1	49 18.72	123 07.45	12	Oct 26/87	1900
2	49 18.65	123 07.27	16	Oct 26/87	1930
3A	49 18.73	123 06.62	13	Oct 26/87	1842
3B	49 18.48	123 06.67	15	Oct 26/87	1830
4A	49 18.50	123 06.48	23	Oct 26/87	1805
11B	49 18.25	123 04.82	30	Oct 26/87	2025
14	49 18.10	123 05.85	30	Oct 26/87	1956
15	49 18.10	123 05.00	40	Oct 28/87	1540
16	49 17.60	123 03.88	24	Oct 28/87	1520
19	49 17.52	123 06.30	22	Oct 29/87	1100
22B	49 17.20	123 05.09	14	Oct 29/87	810
22D	49 17.37	123 05.10	35	Oct 29/87	825
22E	49 17.55	123 04.62	35	Oct 29/87	840
25B	49 17.35	123 04.63	22	Oct 28/87	1615
25D	49 17.46	123 04.62	37	Oct 28/87	1623
25E	49 17.55	123 04.62	35	Oct 28/87	1635
36B	49 17.60	122 53.80	18	Oct 27/87	950
37A	49 17.82	122 53.38	17	Oct 27/87	1020
37B	49 17.71	122 53.40	18	Oct 27/87	1050
39A	49 17.95	122 53.05	14	Oct 27/87	1320
39C	49 17.77	122 53.05	15	Oct 27/87	1240
39E	49 17.60	122 53.06	15	Oct 27/87	1130
40	49 17.98	122 52.87	11	Oct 27/87	1340
41A	49 17.98	122 52.73	10	Oct 27/87	1405
41B	49 18.03	122 52.48	9	Oct 27/87	1424
45	49 17.42	122 51.86	16	Oct 27/87	1650
46	49 17.37	122 51.74	14	Oct 27/87	1712

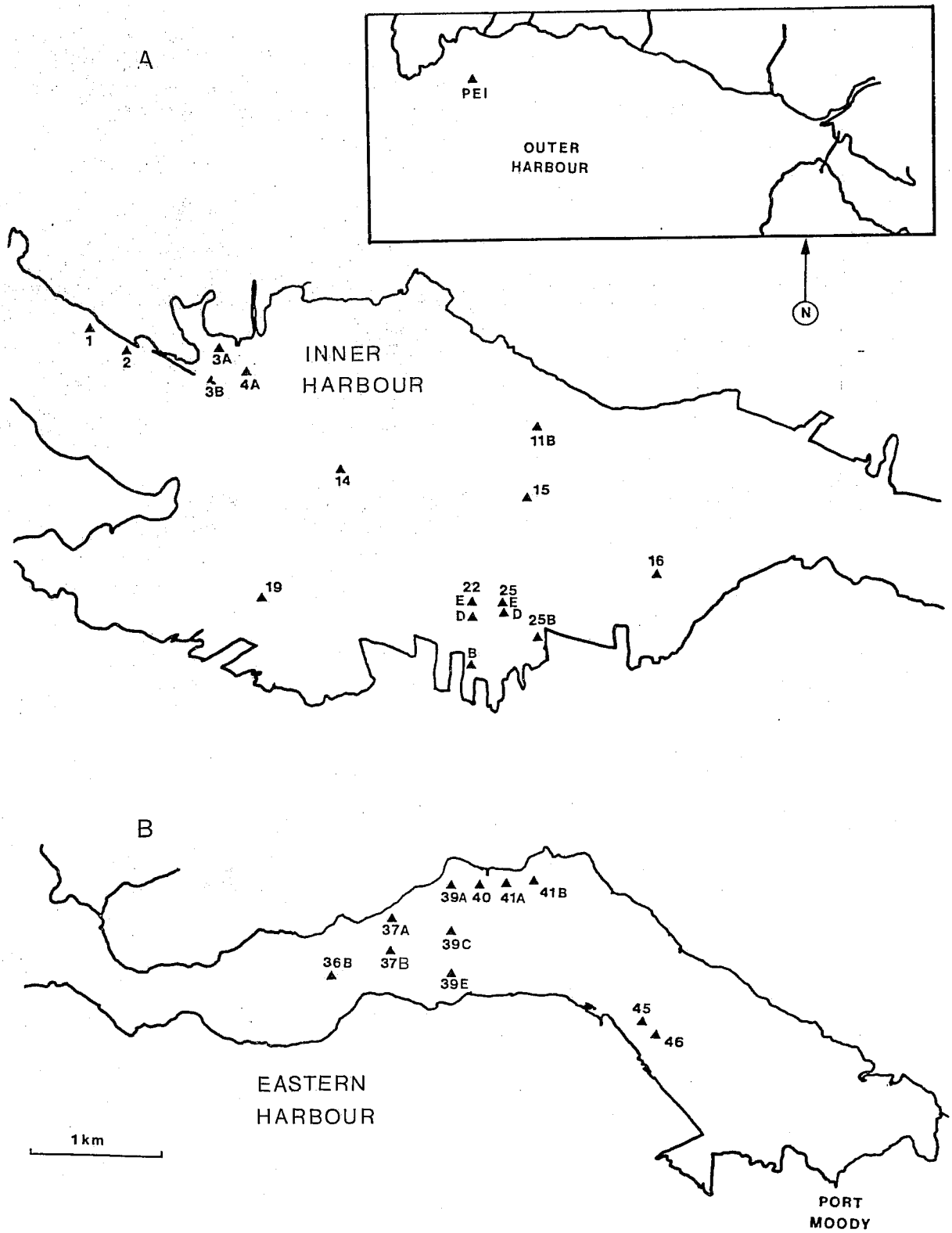

Figure 1. Station locations from A) Inner and Outer Vancouver Harbour, and B) Burrard Inlet near Port Moody. Latitudes and longitudes of stations are given in Table 1. Station PEI was located off the Pacific Environment Institute.

in 65% ethanol and sent to taxonomic experts for identification as follows:

H. Jones, Marine Taxonomic Services	Polychaeta
R. Brinkhurst, Institute Ocean Sciences	Oligochaeta
G. Wilson, Scripps Inst. Oceanography	Isopoda
R. Reid, University Victoria	Mollusca
C. Staude, Friday Harbour Labs	Amphipoda
W. Austin, Khoyatan Marine Labs	Echinodermata, varia

Each expert prepared a reference collection consisting of specimens of each species identified. The original animals and reference collection will shortly be archived at the Royal British Columbia Provincial Museum for a period of time before being incorporated into standard collections.

SEDIMENT PARTICLE SIZE ANALYSIS

The core sample obtained from each grab was immediately stored on ice at 4°C without preservation, and returned to the Institute of Ocean Sciences for analysis. Sediment samples were dried at 80°C for 12 hours, weighed to the nearest 0.01g and washed through a set of 2mm screens to trap gravel. The residue was then washed through a 63 micron mesh screen to trap sand. The silt was considered to be the residue fraction which passed through the two different sized screens. The residue from each size class was then dried overnight at 80°C and weighed. Percent gravel, silt and sand were calculated. This procedure is analagous to the Wentworth method for sieving sediments (Wentworth 1922).

SEDIMENT CHEMISTRY ANALYSES

A selection of values for eight metals and organics was tabulated and averaged from Goyette and Boyd (1989- appendices). The data was standardized from values in ug/g dry weight to a ratio of baseline values considered to be "normal" (baseline values were provided by D. Goyette, DOE/EPS, pers. comm.).

DATA ANALYSES

The abundance matrix (standardized to numbers per $0.5m^2$, 292 taxa) was subjected to an agglomerative, hierarchical cluster analysis using the Bray-Curtis coefficient of similarity with unweighted pair group mean average linkage (Sneath and Sokal 1973). Each replicate was initially included separately in the analysis, to determine agreement between replicates. Since the agreement was reasonable (see Results), replicates were mathematically averaged for each station and a bootstrapping method called SIGTREE (Nemec and Brinkhurst 1988a) which tests the hypothesis that the stations are grouped together by random chance (i.e. that the stations clustered within a given group are the same) was applied. The test utilizes the variability within replicates for each station to simulate many combinations of

values and test the probability that the sampled values occurred by chance. Seventy-five simulations were done.

The percentage of sand and silt/clay particle size fractions were also combined and clustered to form a complimentary "reference" dendrogram for comparison with the abundance dendrogram. The Fowlkes-Mallows test statistic (Fowlkes and Mallows 1983) was used to compare the abundance and reference dendrograms (COMTREE - Nemec and Brinkhurst 1988b). A separate dendrogram was also constructed for station depth, and compared with the abundance dendrogram. These analyses tested the hypothesis that the abundance cluster dendrogram was different at each linkage level from the reference dendrogram (sediment type or depth).

The average sediment chemistry concentrations (ug/g dry weight) were obtained from Goyette and Boyd (1989 - Appendices) were transformed as a ratio of common background levels, then clustered using the same method as described for sediment particle size data (see above). The dendrogram was used as a reference tree to compare with the abundance data using the method developed by Nemec and Brinkhurst (1988b).

RESULTS

SPECIES ABUNDANCE DATA

Numbers of individuals and species obtained in each sample are documented in Table 2. A complete list of identified taxa is included in Appendix B. There is an obvious difference between samples from the inner harbour (1 to 25e) and stations from the eastern harbour (36b to 46). Stations in the eastern harbour had fewer animals and species than those in the inner harbour. In particular, stations 41b, 45 and 46 were almost defaunate. Station PEI in the outer harbour was similar in species richness and overall abundance to the stations in the inner harbour.

The most abundant species overall were the bivalves Axinopsida serricata, Psephidia lordi and Macoma carlottensis; the gastropod Alvania compacta; and the polychaetes Prionospio lighti, Tharyx multifilis, Sphaerosyllis brandhorsti, Nephtys cornuta franciscanum, Exogone lourei, Cossura longocirrata, Chaetozone setosa, Capitella capitata complex, Armandia brevis and Euchone incolor. All of these were more abundant in the inner harbour than in the eastern harbour (Port Moody Arm). Of particular interest was the large number of the coastal tubificid oligochaete species Tubificoides benedii found at station 25d, replicate 2. This species is a common coastal and estuarine species on North Atlantic shores of Northern Europe and North America, where it is usually associated with the oligochaete Clitellio arenarius. T. benedii has not been observed in samples from coastal localitites from San Francisco Bay to Juneau Alaska, even in sites adjacent to Vancouver Harbour (Boundary Bay or Fraser River Estuary). Its apparently limited distribution within

Table 2. Total numbers of organisms and species for Vancouver Harbour sample replicates (0.5m2 surface area)

Area	Station	Replicate	Number/.5m2	No. species
INNER HARBOUR	1	1	447	48
		2	513	42
	2	1	480	34
		2	519	47
	3a	1	357	27
		2	260	34
	3b	1	4499	57
		2	886	59
	4a	1	1644	42
		2	1218	76
	11b	1	2416	46
		2	1965	62
	14	1	748	44
		2	280	50
	15	1	1120	41
		2	1185	65
	16	1	5904	37
		2	1614	50
	19	1	832	41
		2	1813	64
	22b	1	1816	49
		2	1851	65
	22d	1	1372	30
		2	626	64
	22e	1	1272	63
		2	1776	41
	25b	1	596	33
		2	1951	33
	25d	1	1452	35
		2	1872	56
	25e	1	1212	32
		2	1598	49
	Mean		1397	46

Table 2. (continued) Total abundances and species for Vancouver Harbour sample replicates (0.5m2 surface area)

Area	Station	Replicate Number	/.5m2	No. species
EASTERN HARBOUR (Port Moody)	36b	1	188	14
		2	218	27
	37a	1	209	23
		2	225	25
	37b	1	268	12
		2	333	21
	39a	1	30	6
		2	152	16
	39c	1	84	10
		2	206	14
	39e	1	210	10
		2	403	19
	40	1	412	9
		2	636	12
	41a	1	57	16
		2	286	12
	41b	1	11	5
		2	8	2
	45	1	24	3
		2	10	2
	46	1	0	0
		2	36	1
	Mean		182	12
OUTER HARBOUR	PEI	1	646	58
		2	502	50

the harbour would strongly suggest that it is a very recent introduction via the bilge of a ship.

The relative abundances of identified taxa are tabulated in Appendix C. The data from all samples were subjected to cluster analysis. This resulted in 4 apparent clusters (Figure 2), each of which contained both replicates from the included stations. In many instances the replicates were clustered together, and so the data were reanalysed by clustering stations. This allowed the resulting tree (Figure 3) to be tested by the SIGTREE procedure (Appendix D). This tests the hypothesis that any two groups of stations are sufficiently alike that they can be considered to represent a single community. The hypothesis is rejected at the 5% level, that is, any linkage with a P value of 5% or less indicates an unacceptable grouping that is not homogeneous with regard to the relative abundance of identified taxa (see large triangles, Figure 3 - significance values of 10% are indicated as small triangles). The first significant group is made up of stations 1-4 plus 25b. The first five of these are all located along the industrial north shore of the inner harbour, and 25b is situated close to the southern shore. The second group consists of all the remaining stations in the inner harbour, 11 to 25e, excluding station 14. Station PEI (used as a reference station by EPS) is not part of this homogeneous grouping, even though it appears to cluster with the group. This demonstrates the value of using SIGTREE to detect such anomalies.

While the eastern harbour (Port Moody Arm) stations appear to cluster together, only stations 36b, 37a, 37b and 39e are sufficiently similar to form a significant group in terms of the composition of the benthic animals. Stations 41a and 40 are therefore excluded from this significant grouping. The final stations, 41b, 45 and 46 form a cluster with a significance value of 10%, but are quite dissimilar. In this instance the severe depletion of the macrobenthic infauna means that variance between replicates is quite high, increasing the dissimilarity between stations. The apparent homogeneity of these stations (at a probability of 10%) probably occured by chance because of the large number of zero entries in common for these stations. That is, most species had no representatives in any of the three stations. While the three stations produce a sensible station group in biological terms, slight differences in the actual species present make the stations appear to differ greatly. This is an unfortunate artifact of the statistical method. The method becomes more powerful as the number of replicates per station increases, so that the stations excluded from significant groups might have become significant members of existing clusters if more replicates had been analysed. The spatial distribution of significant station clusters is illustrated in Figure 4. With the exception of station 25B, each grouping is spatially coherent, adding further subjective support to their recognition as clusters.

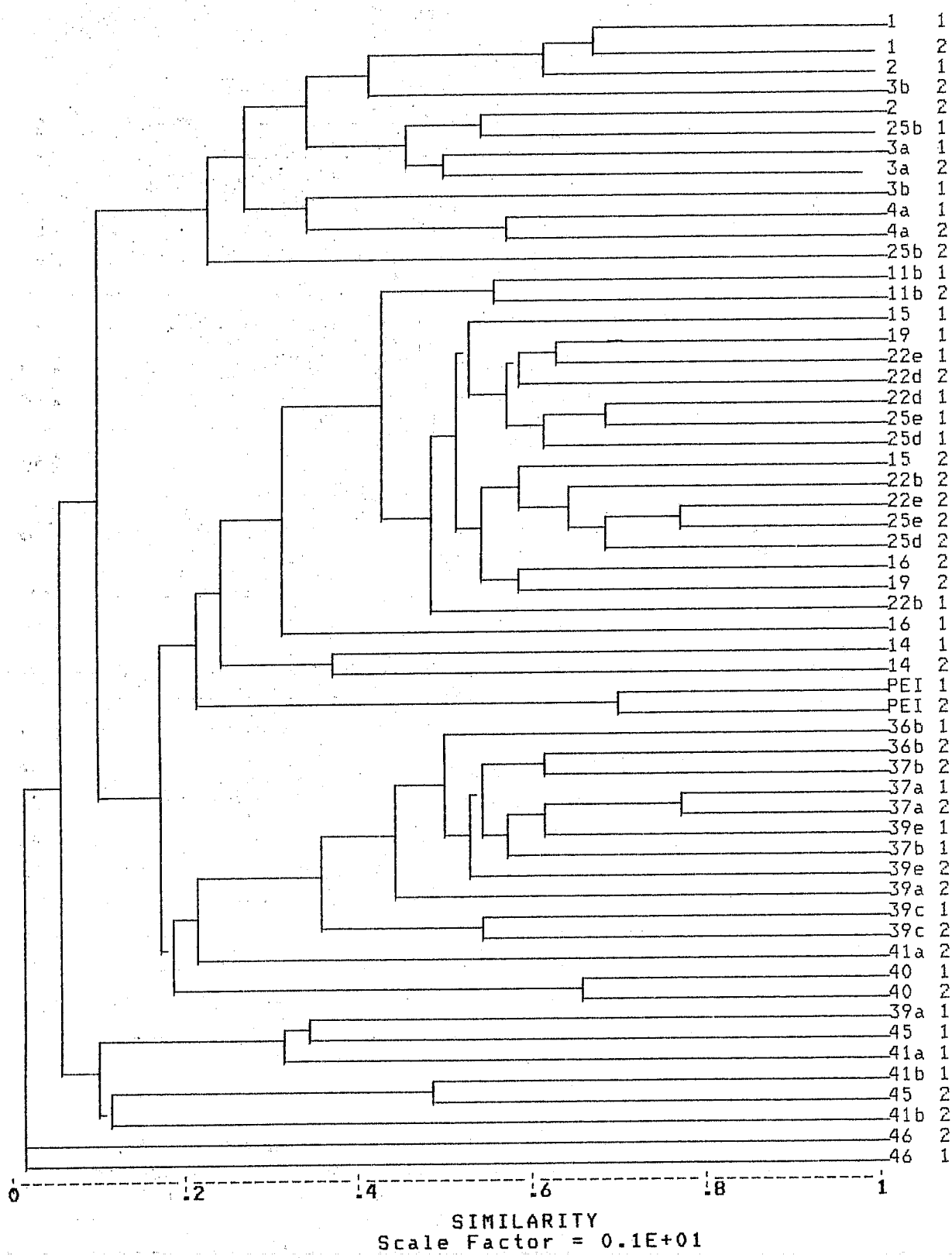

Figure 2. Cluster dendrogram for all sample replicates treated independently ("2 1" refers to station 2, replicate 1, etc.).

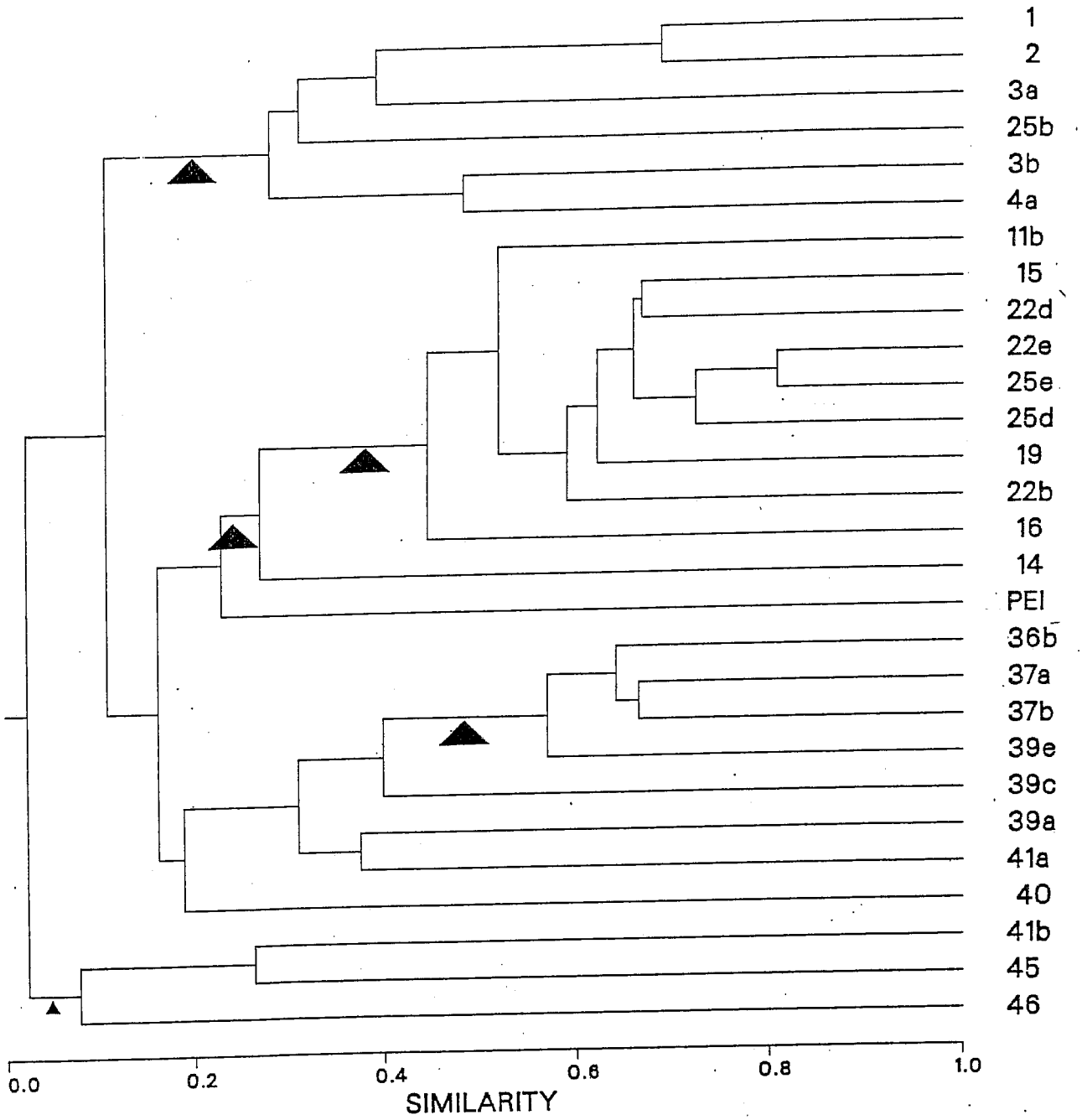

Figure 3. Cluster dendrogram of stations, with duplicate samples averaged but used as basis for bootstrap method for establishing significance of station groupings (replicates averaged). Linkages which delineate significant, homogeneous groups of stations at the 5% level (see Appendix D) are indicated by the large triangles. The small triangle represents a linkage significant at the 10% level.

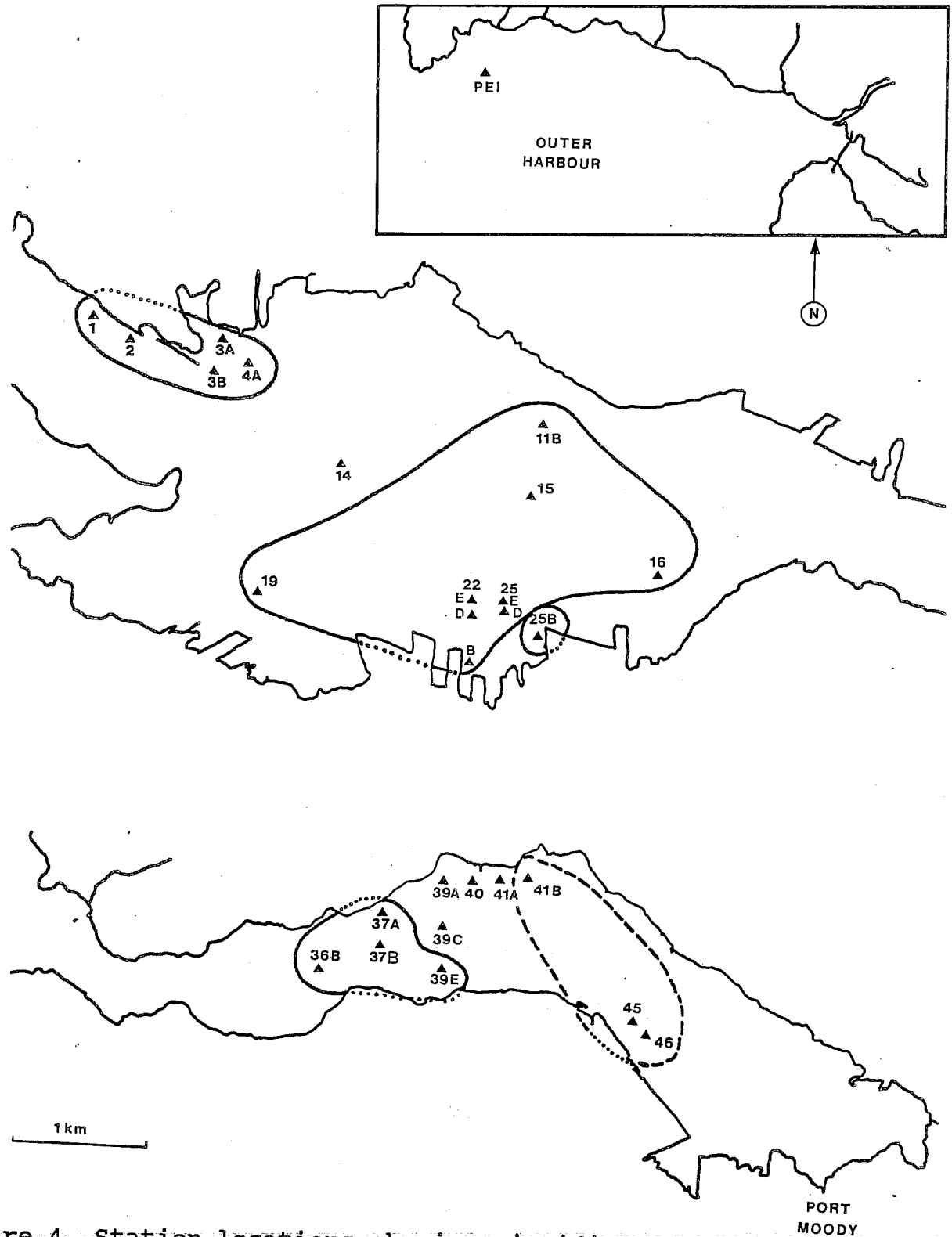

Figure 4. Station locations showing significant groupings at the 5% level (solid lines) as indicated in Figure 3. Note that 25B belongs with the cluster of 1-4A. The dashed cluster indicates the grouping significant at 10% as indicated in Figure 3.

Table 3. Sediment Composition - Vancouver Harbour Samples
Data are unavailable for station 1.

Station	%mud	%sand	%gravel
1	--	--	--
2	5.0	78.4	16.6
3A	64.5	35.5	0.0
3B	2.4	80.0	17.6
4A	26.5	74.4	0.0
11B	43.7	56.3	0.0
14	12.3	73.2	14.5
15	55.3	44.7	0.0
16	49.9	47.9	2.2
19	46.5	50.0	3.5
22B	26.6	67.8	5.5
22D	77.8	22.2	0.0
22E	73.4	26.6	0.0
25D	62.5	36.5	1.0
25E	57.1	39.7	3.2
36B	90.2	9.8	0.0
37A	85.2	14.3	0.5
37B	89.2	9.6	1.2
39A	96.0	4.0	0.0
39C	92.7	6.5	0.8
39E	84.2	14.6	1.2
40	86.1	10.2	3.7
41A	91.2	8.8	0.0
41B	91.4	8.6	0.0
45	94.8	5.2	0.0
46	92.2	7.8	0.0
PEI	90.3	9.7	0.0
MEAN	57.0	30.8	2.6

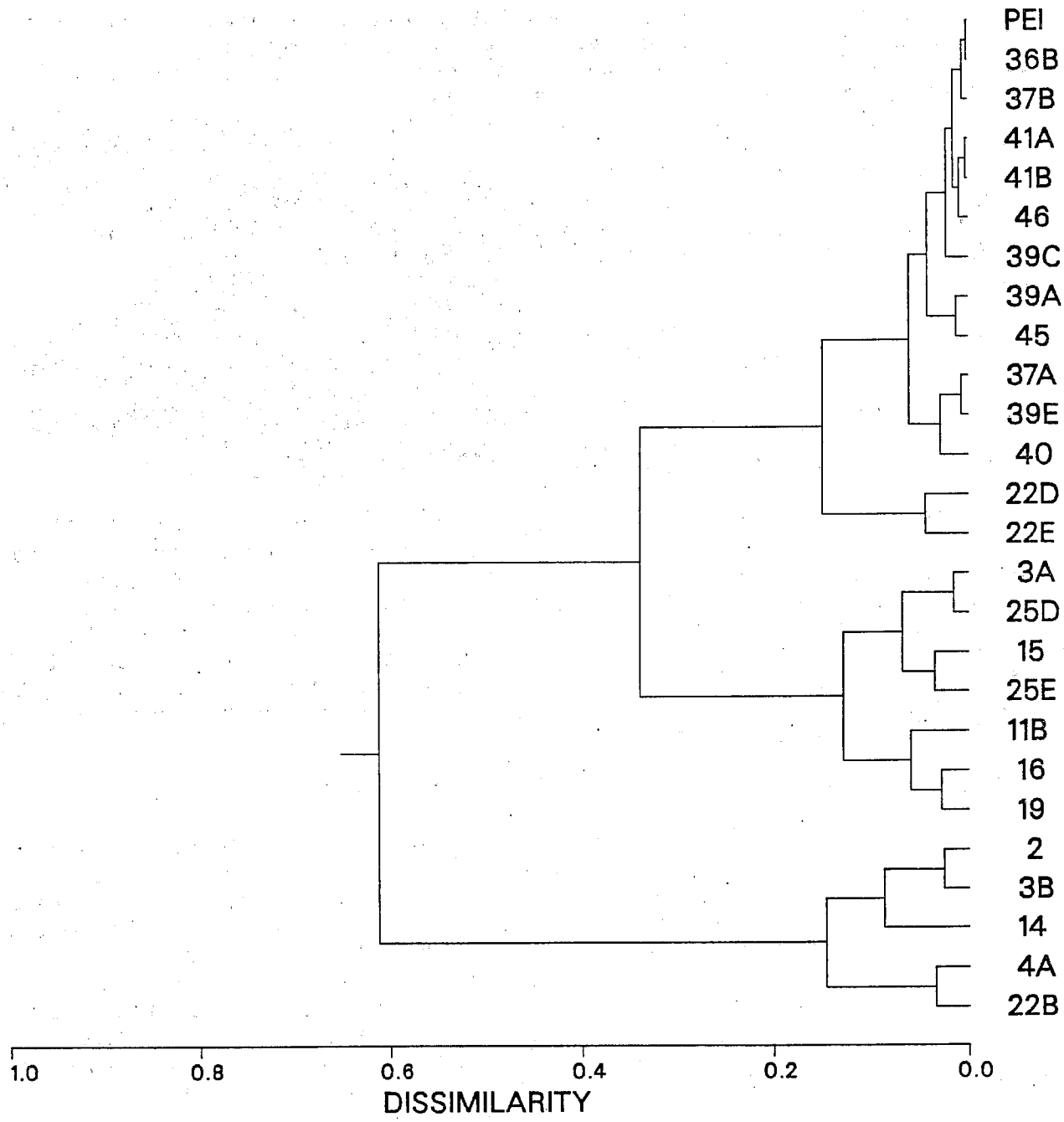

Figure 5. Cluster dendrogram for sediment particle size similarity analysis (see also Appendix E). Note that stations 1 and 25B are missing.

COMPARISON OF BENTHOS WITH SEDIMENT AND DEPTH CHARACTERISTICS

The results of sediment analyses are presented in Table 3. Clustering of stations based on sediment composition is illustrated in Figure 5. Sediments from stations in the inner harbour (2 to 25e, data from stations 1 and 25b were missing) averaged about 50% silt and 50% sand, with some shell and gravel. Variations in these relative sediment components produced three distinct station groups (Figure 6). Sediments from the reference station in the outer harbour (PEI) and from the eastern harbour (Port Moody Arm) were finer and more homogeneous than inner harbour stations, with 80-96% silt, and little sand or gravel. These stations all clustered together with very low dissimilarity. A COMTREE analysis comparing the abundance dendrogram (see Appendix E - 26 stations only) with the sediment dendrogram (Figure 5) could not reject the hypothesis that the two dendrograms were different at 23 out of the 25 linkages. The two significant linkages suggest that the grouping together of stations 36b to 41a in the eastern harbour may have been partially related to homogeneous sediment composition.

Stations were also clustered together according to depth (Figure 6). This arbitrary reference dendrogram was compared to the abundance dendrogram (from Figure 3) using COMTREE (see Appendix F). The hypothesis that the two dendrograms were different could not be rejected at 24 out of 27 linkages. The significant linkages basically suggest that the two groups of stations 15,22d,22e,25d,25e in the inner harbour, and 36b,37a,37b in the eastern harbour may be distinct groups partly due to depth related characteristics.

COMPARISON OF CHEMICAL DATA WITH ABUNDANCE DATA

The sediment chemistry values (Table 4) are based on surveys done prior to the benthic survey (1985 to 1987), and may not represent contemporaneous conditions. The data were transformed in order to avoid inadvertent weighting due to large differences in concentration scale that may be natural rather than anthropogenic. This type of analysis is somewhat naive. For example, combinations of the various contaminants may interract to magnify or reduce their individual toxicity effects. The comparison of chemical data with abundance data is done here to indicate the difficulty of comparing raw chemical data with biological data. The cluster analysis of chemical data is illustrated in Figure 7.

In spite of the aforementioned limitations, 5 of the 27 linkages were significant ($p<0.05$) in the COMTREE analysis (Appendix G), thereby rejecting the hypothesis that the dendrograms are different at these linkage levels. Three further linkages were significant at the 10% level. The chemical data would therefore appear to have a more significant relationship to benthos than either sediment composition or depth alone. For example, the chemical data produce clusters which separate the

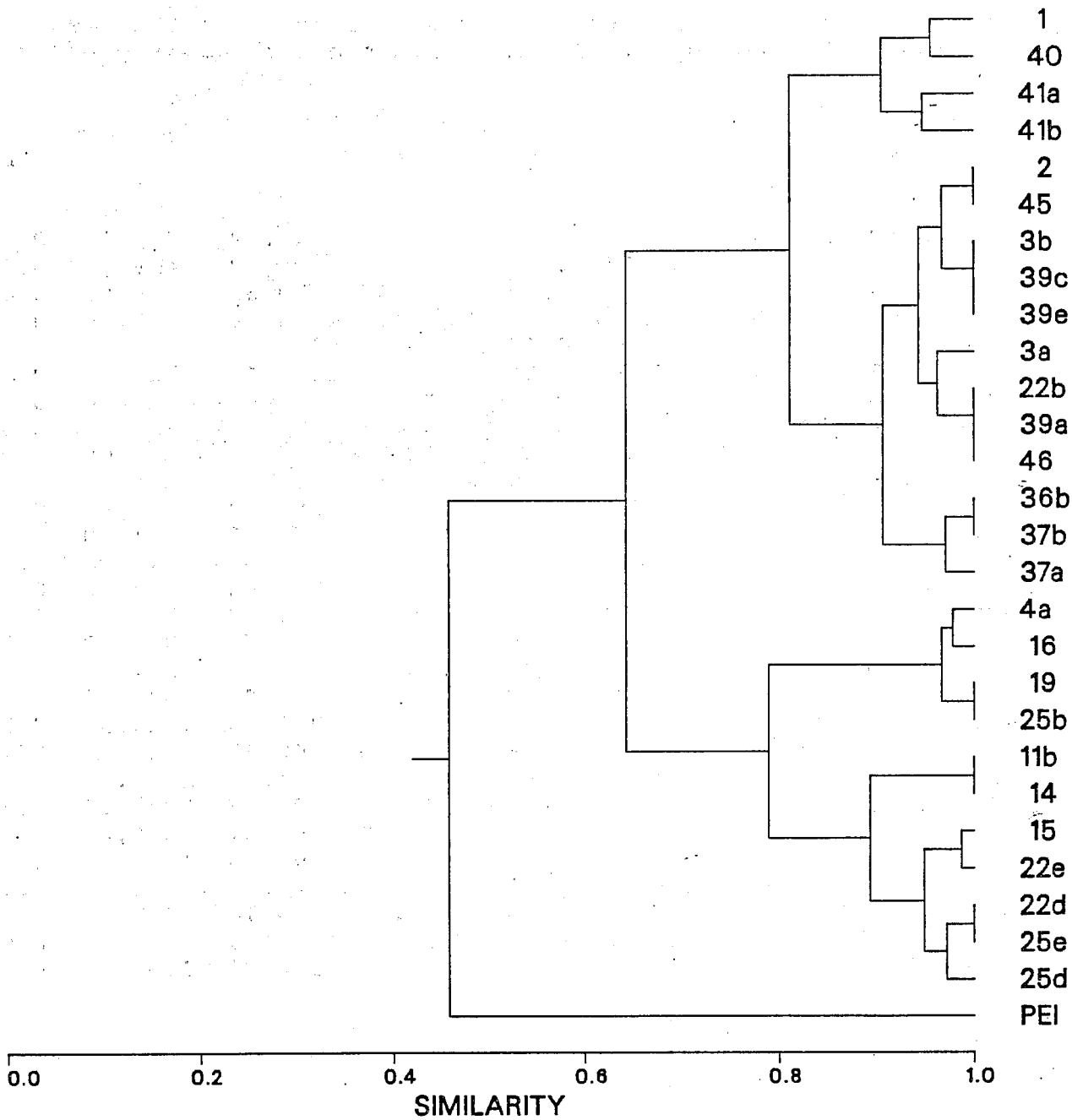

Figure 6. Cluster dendrogram for depth of stations (see also Appendix F).

Table 4a. Chemical data from Vancouver Harbour, 1985 to 1987 (from Goyette and Boyd 1989). HC = hydrocarbon

	Ca	Cr	Cu	Hg	Pb	Zn	HC	PCB
PEI	0.40	54.68	183.50	0.19	52.17	145.83	213.33	0.10
1	5.17	38.50	4082.67	0.16	15420.00	2266.67	459.33	0.04
2	2.54	61.03	4353.33	0.12	584.67	654.33	669.67	0.01
3a	7.43	47.90	1186.60	0.31	255.00	1280.00	938.50	0.07
3b	6.60	47.10	1967.00	0.18	262.30	1260.00	152.70	0.04
4a	2.73	77.03	1206.33	0.26	162.33	2126.67	216.00	0.24
11b	0.44	26.17	180.67	0.10	48.33	116.00	157.00	0.17
14	0.56	32.63	333.00	0.33	63.67	155.00	224.67	0.03
15	0.69	41.80	396.00	0.28	80.70	204.90	295.00	0.06
16	0.46	25.77	190.67	0.16	47.33	139.67	114.33	0.05
19	0.63	39.03	283.00	0.24	81.00	152.67	178.67	0.04
22b	1.50	39.40	838.70	0.31	120.30	362.70	1241.00	0.29
22d	0.82	42.40	859.00	0.25	95.00	237.00	718.00	0.09
22e	0.82	42.40	859.00	0.25	95.00	237.00	718.00	0.09
25b	1.31	31.70	332.00	0.67	240.70	248.30	1713.00	0.44
25d	0.89	43.20	434.70	0.45	135.30	236.70	997.00	0.15
25e	0.89	43.20	434.70	0.45	135.30	236.70	997.00	0.15
36b	0.93	63.77	237.67	0.32	95.33	200.00	1036.67	0.09
37a	1.27	74.53	161.00	0.39	109.33	210.00	1343.33	0.18
37b	1.13	58.60	148.33	0.44	93.00	202.67	1020.67	0.17
39a	1.77	80.07	151.67	0.43	133.67	221.67	2483.33	0.21
39c	1.40	79.10	135.67	0.36	93.33	203.67	1273.33	0.23
39e	1.40	63.07	144.00	0.37	94.33	149.67	1256.67	0.04
40	1.87	96.13	134.33	0.48	298.00	297.33	1683.33	0.08
41a	1.97	128.00	144.33	0.33	120.00	246.00	1836.67	0.32
41b	11.80	111.70	135.00	0.29	110.00	243.70	1707.00	0.10
45	1.69	44.67	61.33	0.11	19.00	126.33	691.33	0.07
46	2.56	64.37	107.00	0.21	64.00	250.00	1366.67	0.09

Table 4b. Chemical data for Vancouver Harbour transformed as ratios: observed to baseline (expected background) levels. Baseline values were supplied by D. Goyette (EPS,DOE).

	Ca	Cr	Cu	Hg	Pb	Zn	HC	PCB
Base	0.3	50	65	0.2	24	115	70	0
PEI	1.3	1.1	2.8	0.9	2.2	1.3	3.0	0.1
1	17.2	0.8	62.8	0.8	642.5	19.7	6.6	0.0
2	8.5	1.2	67.0	0.6	24.4	5.7	9.6	0.0
3a	24.8	1.0	18.3	1.5	10.6	11.1	13.4	0.1
3b	22.0	0.9	30.3	0.9	10.9	11.0	2.2	0.0
4a	9.1	1.5	18.6	1.3	6.8	18.5	3.1	0.2
11b	1.5	0.5	2.8	0.5	2.0	1.0	2.2	0.2
14	1.9	0.7	5.1	1.6	2.7	1.3	3.2	0.0
15	2.3	0.8	6.1	1.4	3.4	1.8	4.2	0.1
16	1.5	0.5	2.9	0.8	2.0	1.2	1.6	0.1
19	2.1	0.8	4.4	1.2	3.4	1.3	2.6	0.0
22b	5.0	0.8	12.9	1.6	5.0	3.2	17.7	0.3
22d	2.7	0.8	13.2	1.2	4.0	2.1	10.3	0.1
22e	2.7	0.8	13.2	1.2	4.0	2.1	10.3	0.1
25b	4.4	0.6	5.1	3.4	10.0	2.2	24.5	0.4
25d	3.0	0.9	6.7	2.2	5.6	2.1	14.2	0.2
25e	3.0	0.9	6.7	2.2	5.6	2.1	14.2	0.2
36b	3.1	1.3	3.7	1.6	4.0	1.7	14.8	0.1
37a	4.2	1.5	2.5	1.9	4.6	1.8	19.2	0.2
37b	3.8	1.2	2.3	2.2	3.9	1.8	14.6	0.2
39a	5.9	1.6	2.3	2.2	5.6	1.9	35.5	0.2
39c	4.7	1.6	2.1	1.8	3.9	1.8	18.2	0.2
39e	4.7	1.3	2.2	1.9	3.9	1.3	18.0	0.0
40	6.2	1.9	2.1	2.4	12.4	2.6	24.0	0.1
41a	6.6	2.6	2.2	1.7	5.0	2.1	26.2	0.3
41b	39.3	2.2	2.1	1.5	4.6	2.1	24.4	0.1
45	5.6	0.9	0.9	0.5	0.8	1.1	9.9	0.1
46	8.5	1.3	1.6	1.1	2.7	2.2	19.5	0.1

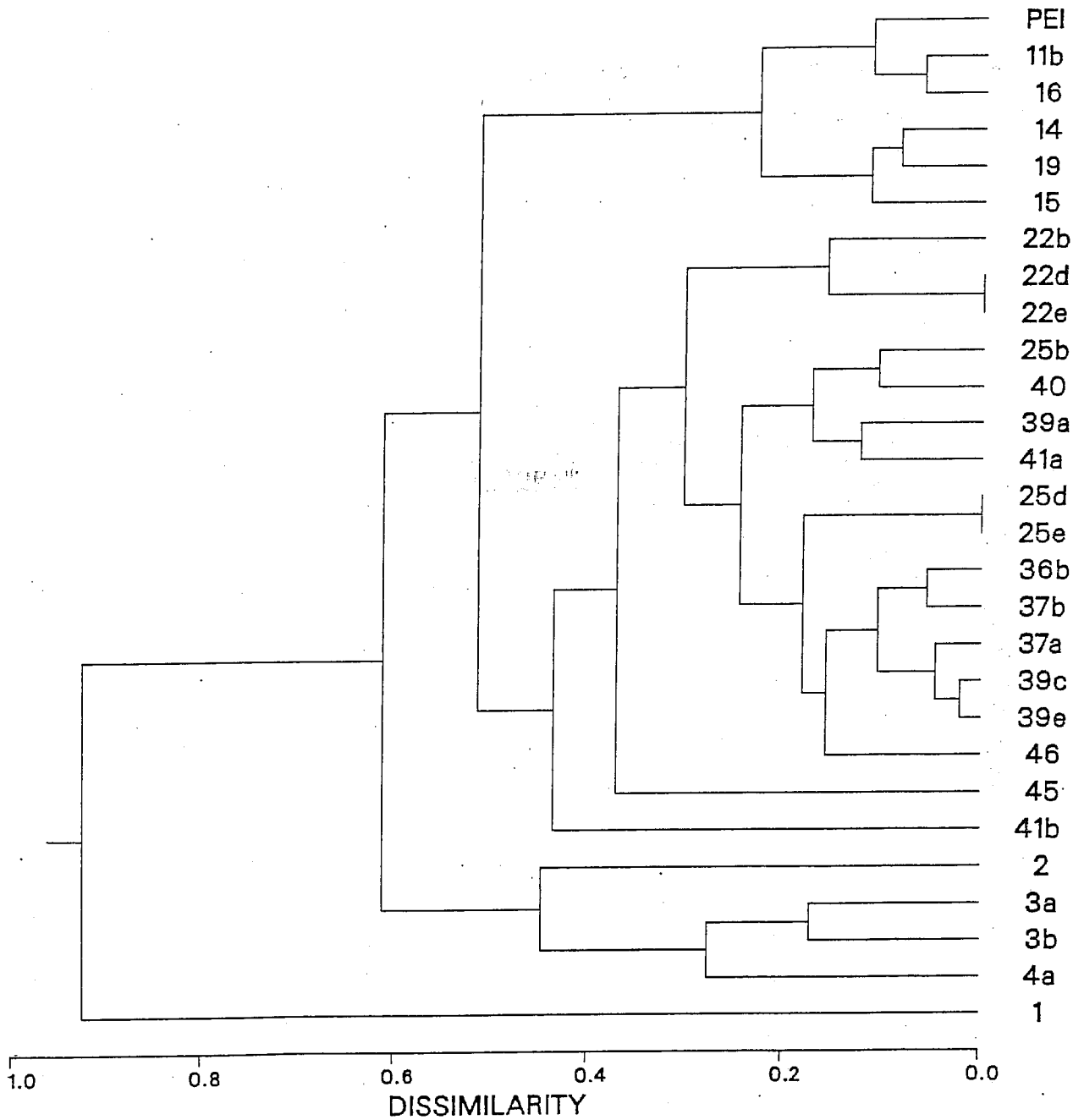

Figure 7. Cluster dendrogram for 8 sediment chemistry factors (see also Appendix G).

group of stations 1 to 4a from all others, and this group forms a statistically significant group in the abundance data as well (along with 25b). The cluster of 36b,37a,37b,39c and 39e is consistent in both the abundance and chemistry dendrograms. In particular, the patterns of depth and chemical dendrograms appear to be somewhat complimentary. If some rational means of combining these environmental factors could be devised, the resulting comparison with the abundance dendrogram would be interesting.

DISCUSSION

The species richnesses and abundances observed at stations 11-25 (inner harbour) appear to be similar to other nearshore coastal B.C. areas (c.f. Burd et al. 1987, Brinkhurst et al. 1987). Since no baseline information on this sampling scale is available which predates the development of heavy industry and shipping in Vancouver Harbour, it is impossible to say what is normal or "healthy" for this area. The fauna in the inner harbour seems to be healthier than might be expected in view of the intensity and duration of human activity in and around the basin. This may be partly related to strong circulation through First Narrows.

Abundances and species richnesses were generally lower in the eastern harbour (Port Moody Arm) than in the inner harbour, suggesting that the eastern harbour (Port Moody Arm) may be more severely affected by anthropogenic factors than the inner harbour. One possible cause of defaunation in these areas may relate to consistent turbulence and burial of benthic fauna due to shipping, or to the degree of tidal flushing experienced. Further analyses would be required to test this properly. However, the severe defaunation at stations 41b, 45 and 46 should serve as warning that this general area is seriously affected by some factor or factors currently unmeasured, presumably anthropogenic in origin.

The statistically significant clusters of stations based on the relative abundance data are coherent geographically and also in terms of overall abundances and species richness. An interesting anomoly is the inclusion of station 25b with stations 1 to 4a. The reason for this is not immediately obvious, but may be related to heavy industrial use of the immediate waterfront.

Species abundance patterns can be assumed to be affected more profoundly by environmental factors not analyzed during this study, or by a specific combination of these factors which may have synergistic effects on species abundance. The station patterns based on species abundance data bore little resemblance to the depth and sediment reference data, except in the separation of stations into inner versus eastern harbour groups. The sediment chemistry samples used in this report were taken in 1985, 1986 and 1987. This type of comparison is necessarily rough, as the rate of change in both chemical composition and species composition of sediments over time are not likely synchronized in any easily recognizable pattern. Even so, the statistical comparison between chemistry and abundance data included more significant linkages than the comparisons with depth or sediment composition. A study of Vancouver Harbour and Burrard Inlet currently in progress (October 1989) will include concurrent benthic and sediment chemistry samples. The potential relationships between benthos and sediment characteristics or chemistry will be examined in more detail upon conclusion of that study.

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Appendix A. Quality Control for sorting efficiency of Vancouver Harbour samples.

Sample	Replicate	Specimens found in residue	% of total = QC
1	1	17	2.54%
11B	1	6	0.76%
22D	2	13	1.64%
36B	1	0	0.00%
40	2	2	1.17%
46	2	0	0.00%

Appendix B. Taxonomic list of species identified from Vancouver Harbour, B.C.

POLYCHAETA
- Orbiniidae
  - Leitoscoloplos pugettensis
  - Orbiniidae sp. indeterminate
  - Orbiniidae sp. juvenile
  - Scoloplos acmeceps
  - Scoloplos sp. juvenile
- Paraonidae
  - Aricidea (Aceta) lopezi
  - Aricidea (Allia) quadrilobata
  - Aricidea sp. indeterminate
  - Levinsenia gracilis
- Cossuridae
  - Cossura longocirrata
  - Cossura modica
- Spionidae
  - Laonice cirrata
  - Paraprionospo pinnata
  - Polydora cardalia
  - Polydora socialis
  - Polydora sp. indeterminate
  - Polydora sp. juvenile
  - Prionospio lighti
  - Prionospio multibranchiata
  - Prionospio sp. juvenile
  - Prionospio steenstrupi
  - Pygospio elegans
  - Spio butleri
  - Spionidae sp. juvenile
  - Spiophanes sp. indeterminate
  - Spiophanes berkeleyorum
  - Spiophanes sp. juvenile
- Trochochaetida
  - Trochochaeta multisetosa
- Chaetopteridae
  - Spiochaetopterus costarum
- Cirratulidae
  - Caulleriella hamata
  - Chaetozone setosa
  - Cirratulidae sp. indet.
  - Cirratulidae sp. juvenile
  - Tharyx multifilis
  - Tharyx sp. G-1
  - Tharyx sp. juvenile
- Capitellidae
  - Capitella capitata complex
  - Capitellidae sp. juvenile
  - Heteromastus filobranchus
  - Mediomastus ambiseta
  - Mediomastus californiensis
  - Mediomastus sp. indeterminate
- Maldanidae
  - Euclymininae sp. indet.
  - Euclymene ?zonalis
  - Maldanidae sp. indet.
  - Nicomache personata
  - Praxillella gracilis
  - Praxillella affinis
  - Rhodine bitorquata
- Opheliidae
  - Armandia brevis
  - Ophelina acuminata
  - Ophelina breviata
- Phyllodocidae
  - Phyllodocidae sp. juv.
  - Eteone longa
  - Eteone sp. juvenile
  - Eulalia levicornuta
  - Eulalia sp. juvenile
  - Phyllodoce groenlandica
  - Phyllodoce hartmanae
  - Phyllodoce mucosa
  - Phyllodoce sp. indeterminate
  - Phyllodoce spp. juvenile
- Aphroditidae
  - Aphrodite sp. juvenile
- Polynoidae
  - Arcteobea spinelytria
  - Harmothoe nr. H. lunulata
  - Polynoidae sp. indet.
  - Polynoidae sp. juvenile
  - Tenonia kitsapensis
- Pholoididae
  - Pholoides aspera
- Sigalionidae
  - Pholoe minuta
- Chrysopetalidae
  - Paleanotus bellis
- Hesionidae
  - Gyptis brevipalpa
  - Hesionidae sp. indet.
  - Micropodark dubia
  - Ophiodromus pugettensis
- Pilargidae
  - Pilargis berkeleyae

Syllidae
- Exogone lourei
- Odontosyllis phosphorea
- Sphaerosyllis brandhorsti
- ?Streptosyllis sp. indet.
- Syllidae sp. indeterminate
- Syllidae sp. juvenile
- Syllidae (sexual form)
- Syllis elongata
- Syllis sp. juvenile
- Trypanosyllis sp. indet.

Nereidae
- Cheilonereis cyclurus
- Nereidae sp. indeterminate
- Nereis procera
- Platynereis bicanaliculata

Glyceridae
- Glycera americana
- Glycera capitata
- Glycera sp. juvenile

Goniadidae
- Glycinde armigera
- Glycinde picta
- Glycinde sp. junveile
- Goniadidae sp. juvenile

Nephtyidae
- Nephtys cornuta cornuta
- Nephtys cornuta franciscanum
- Nephtys ferruginea
- Nephtys punctata
- Nepthys sp. indeterminate
- Nephthys sp. juvenile

Sphaerodoridae
- Sphaerodoropsis sphaerulifer
- Sphaerodoropsis sp. juv.

Onuphidae
- Diopatra ornata
- Onuphidae sp. juvenile
- Onuphis (Nothria) iridescens
- Onuphis sp.juvenile

Lumbrineridae
- Lumbrineris bicirrata
- Lumbrineris luti
- Lumbrineris sp. indeterminate
- Lumbrineris sp. juvenile
- Paraninoe simpla

Dorvilleidae
- Dorvillea pseudorubrovittata
- Dorvilleidae sp. indeterminate
- Dorvilleidae sp. juvenile
- Protodorvillea gracilis
- Schistomeringos caeca
- Schistomeringos rudolphi

Sternaspidae
- Sternaspis scutata

Oweniidae
- Galathowenia oculata

Flabelligerida
- Brada villosa

Sabellariidae
- Idanthyrsus ornamentatus
- Sabellaria cementarium
- Sabellariidae sp. indet.

Pectinariidae
- Pectinaria californiensis
- Pectinaria granulata
- Pectinaria sp. juvenile

Ampharetidae
- Ampharetidae sp. indet.
- Ampharete finmarchica
- Ampharete sp. indet.
- Asabellides sibirica

Terebellidae
- Artacama conferi
- Lanassa venusta venusta
- Nicolea zostericola
- Pista cristata
- Polycirrus sp. complex
- Terebellidae sp. indeterminate
- Terebellidae sp. juvenile

Trichobrancidae
- Terebellides stroemii

Sabellidae
- Chone dunneri
- Euchone incolor
- Sabellidae sp. indeterminate
- Schizobrancia insignis

Serpulidae
- Spirorbis sp. indeterminate

OLIGOCHAETA

Tubificidae
- Limnodriloides victoriensis
- Limnodriloides barnardi
- Tectidrilus diversus
- Tubificoides benedii
- T. bakeri
- T. pseudogaster

Enchytraeidae

ARCHAEOGASTROPODA
- Fissurellidae
  - Diadora aspera

GASTROPODA
- Rissoidae
  - Alvania compacta
- Cerithiidae
  - Bittium attenuatum
  - Bittium munitum
- Cylichnidae
  - Cylichna attonsa
- Columbellidae
  - Mitrella carinata
  - Mitrella gouldi
- Nassariidae
  - Nassarius fossatus
  - Nassarius mendicus
- Pyramidellidae
  - Odostomia quadrae
  - Odostomia tenuisculpta
  - Turbonilla aurantia
  - Turbonilla lordi
  - Turbonilla lyalli
- Philinidae
  - Philine polaris
- Acteonidae
  - Rictaxis punctocoelatus
- Trochidae
  - Solariella obscura

BIVALVIA
- Nuculidae
  - Acila castrensis
  - Nucula carlottensis
  - Nucula tenuis
- Nuculanaidae
  - Nuculana hindsii
- Yoldiidae
  - Yoldia amygdalea
  - Yoldia martyria
  - Yoldia scissurata
- Thyasiridae
  - Axinopsida serricata
- Cardiidae
  - Clinocardium ciliatum
  - Keenecardium fucanum
- Veneridae
  - Compsomyax subdiaphana
  - Psephidia lordi
- Carditidae
  - Cyclocardia ventricosa
- Hiatellidae
  - Hiatella arctica
- Lyonsiidae
  - Lyonsia californica
- Tellinidae
  - Macoma calcarea
  - Macoma carlottensis
  - Macoma elimata
- Myidae
  - Mya arenaria
- Kelliidae
  - Mysella tumida
- Mytilidae
  - Modiolus rectus
- Pandoridae
  - Pandora filosa
- Lucinidae
  - Parvilucina tenuisculpta
- Propiamussidae
  - Parvamussium alaskensis
- Anomiidae
  - Pododesmus macroschisma
- Solenidae
  - Solen sicarius
- Tapetinae
  - Tapes philippinarum
- Mactridae
  - Tresus nuttalli

APLACOPHORA
- Chaetodermatidae
  - Prochaetoderma yongei
  - Chaetoderma sp.

SCAPHOPODA
- Dentalium pretiosum

ISOPODA
- Cryptoniscidae
- Gnathiidae
  - Gnathia
- Idoteidae
  - Synidotea angulata
- Limnoriidae
  - Limnoria lignorum
- Munnidae
  - Munna fernaldi
  - Munna stephenseni
  - Uromunna ubiquita
- Paramunnidae
  - Munnogonium waldronensis
  - Pleurogonium cf. rubicundum
  - Pleurogonium cf. inerme
- Sphaeromatidae
  - Gnorimosphaeroma oregonensis

CUMACEA
- Diastylidae
  - Diastylus pellucida
  - Diastylus umatellensis
  - Diastylus alaskensis
- Nannastacidae
  - Campylaspis rubromaculata
  - Cumella vulgaris
  - Cumella vulgaris juv.
- Leuconidae
  - Eudorella pacifica
  - Leucon sp.

DECAPODA
- Hippolytidae
  - Heptacarpus sp.
- Majidae
  - Oregonia gracilis
- Pinnotheridae
  - Pinnixa occidentalis
  - Pinnixa sp.
  - Spirontocaris sp. juv.
- Crangonidae
  - Crangon alaskensis
- Cancridae
  - Cancer productus
  - Cancer sp.
  - Cancer gracilis
- Paguridae
  - Pagurus sp.

MYSIDACEA
- Mysidae
  - Neomysis kadiakensis
  - Pacifacanthomysis nephrophthalma

AMPHIPODA
- Pontogeneiidae
  - Accedomoera vagor
- Ampeliscidae
  - Ampelisca hancocki
  - Ampelisca lobata
  - Ampelisca unsocalae
  - Byblis veleronis
- Aoridae
  - Aoroides columbiae?
  - Aoroides intermedius?
  - Aoroides spp.
- Caprellidae
  - Caprella laeviuscula?
- Corophiidae
  - Corophium insidiosum?
- Aeginellidae
  - Deutella californica
  - Mayerella banksia
  - Tritella pilimana
- Dexaminidae
  - Dexamonica reduncans
- Podoceridae
  - Dyopedos sp. (monacanthus?)
  - Dulichia rhabdoplastis?
- Phococephalidae
  - Foxiphalus cognatus-similis
  - Heterophoxus oculatus
- Ischyroceridae
  - Ischyrocerus anguipes group
  - Ericthonius hunteri
  - Microjassa litotes
- Lysianassidae
  - Wedecom?
  - Lepidepecreum gurjanovae
- Melitidae
  - Melita dentata
  - Melita desdichada
- Melphidippidae
  - Melphisana bola
- Uristidae
  - Orchomene decipiens
  - Pachynus barnardi
  - Parapleustes? sp.
- Photidae
  - Photis macinerneyi?
  - Photis pachydactyla?
  - Photis sp.
  - Cheirimedeia zotea
  - Protomedeia sp.
  - Kermystheus ociosa
  - Protomedeia (Cheirimedeia)
  - Pleusirus secorrus
  - Pleustes depressa group
  - Pontogeneia cf. rostrata
  - Prachynella lodo
- Stenothoidae
- Synopiidae
  - Tiron biocellata
- Oedicerotidae
  - Rhepoxynius variatus
  - Westwoodila caecula
  - Synchelidium rectipalmum
  - Synchelidium shoemakeri
  - Monoculodes zernovi?

SIPUNCULIDA
 Golfingiidae
  Golfingia or Nephosoma
APLACOPHORA
 Chaetoderma sp.
NEMERTEA
HOLOTHUROIDEA
 Molpadiidae
  Molpadia intermedia
 Phyllophoridae
  Pentamera sp.
OPHIUROIDEA
 Ophiuridae
  Ophiura sp. juv.
 Amphiurdiae
  Amphiodia urtica
  Amphiodia sp.

Appendix C. Vancouver Harbour taxa abundance per 0.5m2 grab surface

STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
POLYCHAETA																												
Ampharete finmarchica	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	0	8	0	0	1	0	0	2	2
Ampharete sp. Indet.	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0
Ampharetidae sp. Indet.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Aphrodite sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	0	0
Arcteobea spinelytra	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Aricidea lopezi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
Aricidea quadrilobata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Aricidea sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Armandia brevis	3	4	14	41	48	33	140	2	96	83	16	9	0	3	15	0	0	0	0	4	96	60	4	4	0	4	0	0
Artacama conifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Asabellides sibirica	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Brada villosa	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capitella capitata complex	1	2	16	15	0	45	20	1	0	0	8	6	0	0	0	0	0	0	0	0	8	12	0	0	0	0	0	0
Capitellidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Caulleriella hamata	0	0	0	0	0	0	8	6	18	0	0	0	20	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Chaetozone setosa	0	0	0	0	0	0	0	0	0	1	128	3	36	6	30	15	552	184	16	28	8	3	44	16	12	12	17	27
Cheilonereis cyclurus	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chone dunneri	1	0	2	0	0	0	0	0	0	5	0	9	4	0	0	3	72	108	0	8	48	3	16	2	0	0	0	0
Cirratulidae sp. Indet.	0	0	0	0	0	0	0	0	30	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	11	0
Cirratulidae sp. Juv	0	0	0	0	9	1	0	4	0	13	56	54	4	7	0	0	264	20	20	36	48	6	88	23	18	62	0	11
Cossura longocirrata	0	0	0	1	0	0	0	1	36	26	216	39	0	0	80	13	192	80	40	128	80	39	108	42	48	46	0	0
Cossura modica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	33
Diopatra ornata	0	0	1	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dorvillea pseudorubrovittata	0	0	0	0	0	0	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0
Dorvilleidae sp. Indet.	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	96	12	0	8	0	0	0	0	6	0	2	6
Dorvilleidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eteone longa	0	0	0	0	0	3	0	0	0	3	16	9	8	0	20	3	24	32	4	0	32	27	12	5	6	2	0	0
Eteone sp. Juv	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	2	0	0
Euchone incolor	0	0	0	0	0	0	0	0	6	9	88	69	0	9	45	13	552	0	28	0	48	27	12	12	12	36	0	2
Euclymene ?zonalis	0	0	0	0	0	0	0	0	0	0	0	15	0	6	10	0	0	0	0	0	0	0	0	0	0	4	0	0
Euclymininae sp. Indet.	0	0	0	0	0	0	0	0	0	1	16	0	0	0	25	2	0	44	0	24	0	48	0	0	0	0	0	4
Eulalia levicornuta	2	0	0	0	0	0	24	5	0	5	0	0	12	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Eulalia sp. Juv	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exogone lourei	1	2	0	4	6	7	140	1	6	6	40	15	108	48	25	10	264	128	96	64	144	3	16	16	84	48	2	2
Galathowenia oculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	2	3
Glycera americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Glycera capitata	1	2	1	2	0	0	4	1	0	1	32	12	8	7	30	8	0	12	4	8	16	0	20	8	24	6	3	2
Glycera sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Glycinde armigera	0	0	0	1	18	0	0	0	6	0	16	0	0	0	10	0	0	0	0	0	8	0	0	0	0	0	2	3
Glycinde picta	0	0	1	0	0	7	8	0	12	13	0	6	0	0	0	2	0	0	0	0	0	9	4	1	0	2	0	0
Glycinde sp. Juv	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goniadidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0
Gyptis brevipalpa	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0

Appendix C. Vancouver Harbour taxa abundance per 0.5m2 grab surface

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
POLYCHAETA																												
Ampharete finmarchica	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ampharete sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ampharetidae sp. Indet.	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aphrodite sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arcteobea spinelytra	0	0	0	0	0	0	0	4	0	1	4	0	0	0	0	13	0	3	0	0	0	0	0	0	0	0	0	0
Aricidea lopezi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aricidea quadrilobata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aricidea sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Armandia brevis	146	152	12	26	0	12	0	0	0	0	0	0	3	0	0	0	6	3	8	8	4	3	0	0	0	0	0	0
Artacama conifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asabellides sibirica	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brada villosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capitella capitata complex	28	964	6	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	135	2	0	0	4	0	0
Capitellidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caulleriella hamata	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chaetozone setosa	0	0	6	89	18	32	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheilonereis cyclurus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chone dunneri	0	0	6	36	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0
Cirratulidae sp. Indet.	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cirratulidae sp. Juv	2	0	0	118	126	56	0	0	2	1	0	4	0	7	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Cossura longocirrata	0	0	36	56	54	60	8	16	5	5	16	24	0	3	2	3	0	26	0	0	1	0	0	0	0	0	0	0
Cossura modica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diopatra ornata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dorvillea pseudorubrovittata	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dorvilleidae sp. Indet.	0	0	6	3	6	4	0	0	1	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Dorvilleidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eteone longa	0	20	0	3	6	12	4	4	0	1	0	12	0	0	2	7	6	0	0	0	0	0	0	0	0	0	0	0
Eteone sp. Juv	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euchone incolor	0	0	24	0	12	20	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euclymene ?zonalis	0	0	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euclymininae sp. Indet.	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eulalia levicornuta	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eulalia sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exogone lourei	10	60	90	82	72	24	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Galathowenia oculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glycera americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glycera capitata	0	0	12	10	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glycera sp. Juv	0	0	12	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glycinde armigera	2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glycinde picta	0	0	0	0	0	8	0	0	1	0	0	0	0	0	1	0	0	3	0	0	0	3	0	0	0	0	0	0
Glycinde sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goniadidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Gyptis brevipalpa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	2	0	0	0	0

STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Harmothoe nr. H. lunulata	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	0
Hesionidae sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heteromastus filobranchus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	12	0	8	16	3	8	2	0	6	0	0
Idanthyrsus ornamentatus	0	2	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lanassa venusta venusta	0	0	0	0	9	0	4	3	6	12	16	6	0	0	5	1	48	0	0	4	0	21	4	0	0	4	0	0
Laonice cirrata	0	0	0	0	0	0	0	0	0	1	16	3	0	0	10	0	0	0	0	4	8	12	4	0	0	4	1	1
Leitoscoloplos pugettensis	2	0	0	0	0	0	0	0	12	9	0	3	4	3	0	0	0	4	0	0	0	15	0	0	0	2	1	0
Levensenia gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
Lumbrineris bicirrata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	4	0	0	8	0	0	0	0	2	0	0
Lumbrineris luti	0	0	0	0	0	0	0	0	12	1	64	9	0	5	5	0	0	0	0	0	32	18	32	15	6	8	0	0
Lumbrineris sp. Indet.	0	0	0	0	0	0	0	0	0	14	0	3	0	0	0	2	0	16	4	40	56	69	0	0	24	28	34	33
Lumbrineris sp. Juv	0	0	0	0	18	1	8	0	18	0	8	0	0	2	0	0	0	0	0	24	0	0	4	0	0	0	0	0
Maldanidae sp. Indet.	0	0	0	0	0	0	0	0	0	1	0	3	12	0	5	1	0	4	16	12	0	24	12	0	0	10	0	3
Mediomastus ambiseta	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Mediomastus californiensis	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	1	0	4	0	6
Mediomastus sp. Indet.	0	0	0	0	0	0	0	0	6	6	24	0	8	0	15	0	144	8	12	4	40	24	4	0	24	0	1	1
Micropodarka dubia	63	29	25	17	3	1	156	32	6	8	0	12	4	8	0	0	0	4	0	0	0	3	0	0	0	0	0	0
Nephtys cornuta cornuta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113	64
Nephtys cornuta franciscanum	0	0	0	0	33	8	0	0	0	7	168	84	4	1	90	25	216	48	16	40	24	12	64	19	96	46	0	0
Nephtys ferruginea	0	0	0	0	0	1	0	0	0	1	0	0	0	1	5	2	0	16	4	8	0	3	4	1	0	0	1	0
Nephtys punctata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Nephtys sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephtys sp. Juv	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	16	0	0	0	0	0	0	0	0
Nereidae sp. Indet.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nereis procera	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	24	4	0	4	8	12	12	1	0	4	0	0
Nicolea zostericola	0	0	0	0	0	0	0	2	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nicomache personata	0	0	0	0	0	0	0	0	0	0	0	0	92	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontosyllis phosphorea	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Onuphidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0	0	0	0	4	0	0	0	0	0	0	0	0
Onuphis iridescens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Onuphis sp. Juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ophelina accuminata	0	0	0	0	0	0	0	0	12	2	16	0	4	1	0	1	48	8	0	0	8	18	8	1	0	0	0	1
Ophelina breviata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Ophiodromus pugettensis	1	0	0	1	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ophryotrocha pugettensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orbiniidae sp. Indet.	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orbiniidae sp. Juv	0	0	0	3	6	1	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paleonotus bellis	16	11	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraninoe simpla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5
Paraprionospio pinnata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	4	0	0	0	1	0	0	0	0
Pectinaria californiensis	0	0	0	0	0	0	0	0	0	0	0	3	0	0	5	3	0	0	0	4	0	0	0	0	0	12	0	0
Pectinaria granulata	0	0	1	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Pectinaria sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pholoe minuta	0	0	0	1	6	0	32	2	0	5	96	15	8	1	15	3	0	44	12	24	40	51	16	6	0	8	4	1
Pholoides aspera	0	0	0	0	0	0	0	2	0	3	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodoce groenlandica	1	0	0	0	0	0	0	0	0	0	8	0	0	0	5	0	24	0	0	4	0	3	0	0	0	0	0	0
Phyllodoce hartmanae	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46		
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
Harmothoe nr. H. lunulata	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesionidae sp. Indet.	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heteromastus filobranchus	0	0	0	0	0	20	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	1	3	0	0	0	0	0	0
Idanthyrsus ornamentatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lanassa venusta venusta	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laonice cirrata	0	4	0	13	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leitoscoloplos pugettensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Levensenia gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lumbrineris bicirrata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lumbrineris luti	0	0	0	62	0	8	0	0	2	1	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lumbrineris sp. Indet.	0	8	0	36	24	40	0	4	0	0	4	12	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0
Lumbrineris sp. Juv	2	0	30	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0
Maldanidae sp. Indet.	0	0	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediomastus ambiseta	0	0	0	0	0	0	0	4	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediomastus californiensis	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediomastus sp. Indet.	0	0	6	0	0	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micropodarka dubia	12	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Nephtys cornuta cornuta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephtys cornuta franciscanum	0	8	60	52	42	32	52	62	44	58	80	76	9	72	11	33	30	65	0	0	25	32	0	0	12	0	0	0	0
Nephtys ferruginea	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephtys punctata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephtys sp. Indet.	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephtys sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nereidae sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nereis procera	0	8	6	10	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nicolea zostericola	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nicomache personata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontosyllis phosphorea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Onuphidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Onuphis iridescens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Onuphis sp. Juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ophelina accuminata	0	0	0	10	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ophelina breviata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ophiodromus pugettensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Ophryotrocha pugettensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Orbiniidae sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orbiniidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paleonotus bellis	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraninoe simpla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraprionospio pinnata	0	0	0	0	0	0	0	0	1	2	0	0	0	3	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Pectinaria californiensis	0	0	12	20	0	8	0	0	2	1	0	8	0	7	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
Pectinaria granulata	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pectinaria sp. Juv	0	0	0	0	0	0	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pholoe minuta	0	8	18	7	6	16	0	0	1	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Pholoides aspera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodoce groenlandica	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodoce hartmanae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Phyllodoce mucosa	0	0	0	0	0	0	20	0	0	0	0	0	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1
Phyllodoce sp. Indet.	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodoce sp. Juv.	0	1	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
Phyllodocidae sp. Juv	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilargis berkeleyae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Pista cristata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	4	0	0	0	6	0	0	0	0	3	14
Platynereis bicanaliculata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polychaeta sp. Juv	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polycirrus sp. complex	0	0	0	0	0	0	0	0	6	6	56	30	8	0	0	0	96	36	0	12	8	9	0	0	0	0	0	0
Polydora cardalia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	16	6	0	0	0	0	0	0
Polydora socialis	0	1	0	0	0	0	32	10	0	2	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0
Polydora sp. Juv	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0
Polydora sp. Indet.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polynoidae sp. Indet.	0	0	0	0	0	1	0	0	0	1	0	3	0	0	0	1	0	4	0	28	0	3	0	0	0	0	0	0
Polynoidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Praxillella affinis affinis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0	0	0	0	0	0	0
Praxillella gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	24	0	3	0	0	0	0	1	0
Prionospio lighti	207	193	259	113	18	5	776	122	462	167	72	30	32	11	25	11	24	8	0	4	16	6	24	12	18	76	77	53
Prionospio multibranchiata	2	4	12	1	0	0	8	1	0	1	0	0	0	4	0	0	0	4	8	0	0	0	0	1	0	0	0	0
Prionospio sp. Juv	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prionospio steenstrupi	6	0	4	0	6	1	12	0	30	14	16	0	40	12	25	3	0	4	4	12	16	30	4	1	6	2	8	14
Protodorvillea gracilis	6	0	0	1	0	0	0	1	0	0	0	0	4	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Pygospio elegans	0	0	0	0	3	0	56	10	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhodine bitorquata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Sabellaria cementarium	0	0	0	0	0	0	400	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sabellaridae sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Sabellidae sp. Indet.	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
Schistomeringos caeca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	5
Schistomeringos rudolphi	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schizobranchia insignis	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scoloplos acmeceps	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	40	3	0	0	0	0	2	0
Scoloplos sp. Juv	0	0	1	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	0
Sphaerodoropsis sphaerulifer	0	0	0	0	0	0	0	0	0	0	32	9	0	2	0	2	24	4	4	28	0	12	0	0	6	8	2	3
Sphaerodoropsis sp. Juv	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphaerosyllis brandhorsti	0	2	1	0	6	0	0	21	162	58	464	411	52	19	55	20	48	0	52	88	0	39	52	5	126	56	13	3
Spio butleri	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spiochaetopterus costerum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spionidae sp. Juv	0	7	0	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spiophanes berkeleyorum	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3	1
Spiophanes sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spiophanes sp. Juv	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spirobis sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sternaspis scutata	0	0	0	0	0	0	0	0	0	0	16	3	0	0	0	2	48	20	0	20	8	15	0	1	0	8	5	4
Streptosyllis? sp. Indet.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syllidae sp. Indet.	0	1	0	0	0	1	40	3	6	1	0	0	8	0	0	0	0	0	0	8	16	0	0	0	0	0	0	0
Syllidae sp. Juv	7	0	0	0	0	1	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syllidae (sexual form)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Syllis elongata	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	1	0	0	0	0	0	9	0	0	0	0	0	0

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Phyllodoce mucosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodoce sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodoce sp. Juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phyllodocidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilargis berkeleyae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Pista cristata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Platynereis bicanaliculata	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polychaeta sp. Juv	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polycirrus sp. complex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polydora cardalia	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polydora socialis	4	4	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	3	16	4	0	3	0	0	0	0	0	0
Polydora sp. Juv	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polydora sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polynoidae sp. Indet.	0	0	6	3	0	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polynoidae sp. Juv	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Praxillella affinis affinis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Praxillella gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prionospio lighti	80	120	18	23	18	24	28	12	16	32	36	4	3	3	1	0	6	7	0	0	1	3	2	5	0	0	0	0
Prionospio multibranchiata	4	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prionospio sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prionospio steenstrupi	0	16	0	13	6	0	4	0	3	0	4	0	0	3	0	0	6	0	72	48	0	0	0	0	0	0	0	0
Protodorvillea gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pygospio elegans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhodine bitorquata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sabellaria cementarium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sabellaridae sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sabellidae sp. Indet.	0	0	0	0	6	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schistomeringos caeca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schistomeringos rudolphi	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schizobranchia insignis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scoloplos acmeceps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scoloplos sp. Juv	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphaerodoropsis sphaerulifer	0	0	6	3	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphaerodoropsis sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphaerosyllis brandhorsti	2	0	90	0	36	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spio butleri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spiochaetopterus costerum	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spionidae sp. Juv	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Spiophanes berkeleyorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Spiophanes sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
Spiophanes sp. Juv	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spirobis sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sternaspis scutata	0	0	0	3	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streptosyllis? sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syllidae sp. Indet.	2	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syllidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syllidae (sexual form)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syllis elongata	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI		
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Syllis sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Tenonia kitsapensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Terebellidae sp. Indet.	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Terebellidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	4	0	0	3	0	0	0	2	0	1
Terebellides stroemi	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9
Tharyx multifilis	0	0	0	1	0	0	8	0	0	23	32	33	8	17	80	63	72	80	24	20	56	39	196	81	108	92	0	20
Tharyx sp. G-1	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	2	0
Tharyx sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0
Trochochaeta multisetosa	0	0	0	0	3	0	0	0	0	0	0	6	0	0	0	3	48	4	4	8	8	9	16	3	6	16	30	0
Trypanosyllis sp. Indet.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARCHAEOGASTROPODA																												
Diadora aspera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
GASTROPODA																												
Alvania compacta	25	142	49	173	90	112	999	159	324	530	24	12	28	8	0	60	0	0	16	0	16	11	0	0	12	1	0	0
Bittium attenuatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	8	0	6	1	0	0
Bittium munitum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Cylichna attonsa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mitrella carinata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mitrella gouldi	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	13	0	0	0	0	0	0	0	0	12	0	0	0
Nassarius fossatus	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nassarius mendicus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odostomia quadrae	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Odostomia tenuisculpta	2	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
Philine polaris	0	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rictaxis punctocoelatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solariella obscura	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbonilla aurantia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Turbonilla lordi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbonilla lyalli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BIVALVIA																												
Acila castrensis	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	4	0	0	4	0	0	7	0	0
Axinopsida serricata	0	0	0	0	0	0	0	2	84	13	256	249	56	12	160	397	1104	380	184	416	248	734	320	229	210	713	124	110
Clinocardium ciliatum	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Compsomyax subdiaphana	0	0	0	0	0	0	0	0	0	1	0	0	0	8	20	0	24	16	0	0	0	8	32	3	0	28	0	0
Cyclocardia ventricosa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hiatella arctica	3	3	0	0	0	0	24	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keenecardium fucanum	0	0	1	2	3	0	8	0	6	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0
Lyonsia californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	2	0	0
Macoma calcarea	0	0	0	6	0	0	28	0	6	0	0	0	0	0	0	1	0	16	0	3	0	16	52	6	0	34	5	3
Macoma carlottensis	2	0	10	18	18	0	0	0	24	0	8	144	0	8	65	145	144	0	4	0	0	24	0	27	102	56	0	0
Macoma elimata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
Mya arenaria	0	0	1	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mysella tumida	0	0	0	0	0	0	0	0	0	0	8	0	0	0	10	0	0	8	8	0	0	0	0	0	0	0	0	0
Modiolus rectus	2	34	1	5	0	3	76	21	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Nucula carlottensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nucula tenuis	0	0	1	0	0	0	4	0	0	2	0	9	0	0	5	18	0	32	16	56	0	3	12	15	0	30	3	0
Nuculana hindsii	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	4	0	0	0	16	0	0	0	1	0	2	3	0
Pandora filosa	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	3	0	0	0	3	8	5	4	0	0	10	0	0

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46		
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
Syllis sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tenonia kitsapensis	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Terebellidae sp. Indet.	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Terebellidae sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Terebellides stroemi	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tharyx multifilis	2	4	336	75	60	88	4	14	31	33	28	40	6	0	48	95	18	81	244	432	0	0	0	0	0	0	0	0	0
Tharyx sp. G-1	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tharyx sp. Juv	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trochochaeta multisetosa	0	0	0	20	6	8	0	7	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	0	0	0
Trypanosyllis sp. Indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARCHAEOGASTROPODA																													
Diadora aspera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GASTROPODA																													
Alvania compacta	92	124	0	92	6	4	0	1	0	1	0	0	3	8	0	1	0	0	20	4	1	13	1	0	0	0	0	0	0
Bittium attenuatum	0	0	0	0	12	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bittium munitum	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cylichna attonsa	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Mitrella carinata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mitrella gouldi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Nassarius fossatus	0	4	0	0	0	0	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0
Nassarius mendicus	0	0	0	0	0	0	8	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Odostomia quadrae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odostomia tenuisculpta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philine polaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	2	0	3	0	0	36	
Rictaxis punctocoelatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Solariella obscura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbonilla aurantia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbonilla lordi	0	0	6	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	8	4	0	0	0	0	0	0	0	0	0
Turbonilla lyalli	0	0	6	4	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
BIVALVIA																													
Acila castrensis	0	0	0	6	0	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Axinopsida serricata	0	40	264	625	348	587	24	35	49	39	0	48	0	9	10	14	54	70	0	52	0	3	0	0	0	0	0	0	0
Clinocardium ciliatum	0	8	0	8	0	3	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Compsomyax subdiaphana	2	8	0	6	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclocardia ventricosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hiatella arctica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keenecardium fucanum	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lyonsia californica	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macoma calcarea	0	32	60	0	30	0	0	1	0	6	0	6	0	0	3	0	0	5	4	0	0	3	0	0	6	0	0	0	0
Macoma carlottensis	0	40	0	40	0	58	0	5	0	0	4	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
Macoma elimata	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mya arenaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mysella tumida	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Modiolus rectus	0	8	0	0	0	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nucula carlottensis	0	0	0	0	0	0	4	0	2	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0
Nucula tenuis	0	0	36	49	6	14	0	10	0	1	0	14	3	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
Nuculana hindsii	0	0	0	2	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pandora filosa	0	0	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Parvilucina tenuisculpta	0	0	0	0	0	0	0	0	0	0	8	3	4	0	0	21	24	0	0	0	0	22	16	2	0	26	0	0
Parvamussium alaskensis	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pododesmus macroschisma	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psephidia lordi	4	3	10	19	0	0	28	5	18	41	8	357	32	27	65	242	1296	88	96	335	144	176	100	47	168	187	0	0
Solen sicarius	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapes philippinarum	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tresus nuttalli	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yoldia amygdalea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Yoldia martyria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	5	4
Yoldia scissurata	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	1
APLACOPHORA																												
Prochaetoderma yongei	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Chaetoderma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
SCAPHOPODA																												
Dentalium pretiosum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
ISOPODA																												
Cryptoniscidae	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gnathia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synidotea angulata	0	0	1	1	0	0	0	1	0	8	0	0	0	1	0	1	0	0	0	4	0	0	0	0	0	0	0	0
Limnoria lignorum	0	0	0	0	0	1	60	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Munna fernaldi	0	1	0	0	0	0	8	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Munna stephenseni	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uromunna ubiquita	1	0	0	0	0	0	20	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Munnogonium waldronensis	0	2	1	4	0	0	68	10	30	4	0	6	0	0	0	0	24	0	0	0	0	0	8	0	6	0	0	0
Pleurogonium cf rubicundum	0	0	0	0	0	1	0	0	0	0	8	24	0	3	5	6	0	0	0	12	0	0	4	0	6	2	2	0
Pleurogonium cf inerme	1	2	0	3	0	0	0	1	6	0	0	54	4	1	5	0	0	0	0	8	0	4	0	0	0	10	0	0
Gnorimosphaeroma oregonensis	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUMACEA																												
Diastylus pellucida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Diastylus umatellensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Diastylus alaskensis	0	0	0	1	6	1	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Eudorella pacifica	0	0	1	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	8	16	8	1	0	0	0	0	1	4
Campylaspis rubromaculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Cumella vulgaris	1	3	1	0	0	2	216	10	12	0	0	3	0	0	5	0	24	0	4	0	8	0	0	0	6	0	0	0
Leucon sp.	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	7	0	0	0	8	0	0	4	0	0	0	0	0
Cumella vulgaris juv.	0	0	0	0	0	0	0	0	0	0	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DECAPODA																												
Heptacarpus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Oregonia gracilis	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pinnixa occidentalis	0	0	0	0	0	0	0	0	0	0	8	3	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0
Pinnixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spirontocaris sp. juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Crangon alaskensis	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer productus	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer sp.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0
Pagurus sp.	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Parvilucina tenuisculpta	0	0	30	32	18	14	0	0	1	1	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
Parvamussium alaskensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pododesmus macroschisma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psephidia lordi	14	0	198	61	156	168	24	13	14	9	16	36	0	13	3	4	12	0	32	44	4	68	3	0	0	4	0	0
Solen sicarius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapes philippinarum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tresus nuttalli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yoldia amygdalea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yoldia martyria	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yoldia scissurata	0	0	12	49	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APLACOPHORA																												
Prochaetoderma yongei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chaetoderma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCAPHOPODA																												
Dentalium pretiosum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ISOPODA																												
Cryptoniscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gnathia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synidotea angulata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnoria lignorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Munna fernaldi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Munna stephenseni	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uromunna ubiquita	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Munnogonium waldronensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleurogonium cf rubicundum	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleurogonium cf inerme	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gnorimosphaeroma oregonensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUMACEA																												
Diastylus pellucida	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diastylus umatellensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diastylus alaskensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eudorella pacifica	0	0	0	0	0	0	0	0	22	15	64	4	0	0	2	1	54	98	0	0	0	0	0	0	0	0	0	0
Campylaspis rubromaculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cumella vulgaris	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leucon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cumella vulgaris juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DECAPODA																												
Heptacarpus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oregonia gracilis	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pinnixa occidentalis	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pinnixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spirontocaris sp. juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crangon alaskensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer productus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer gracilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pagurus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
MYSIDACEA																												
Neomysis kadiakensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacifacanthomysis nephrophth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	4	0	0	0	0	0	0	0	0	0	0
SIPUNCULIDA																												
Golfingia or Nephosoma	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	1	24	0	0	0	8	0	0	0	0	0	1	1
APLACOPHORA																												
Chaetoderma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
NEMERTEA	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	1
HOLOTHUROIDEA																												
Molpadia intermedia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Pentamera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OPHIUROIDEA																												
Ophiura sp. juv.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphiodia urtica	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	24	1	0	0	0	0	0	0	0	0	0	0
Amphiodia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0
AMPHIPODA																												
Accedomoera vagor	5	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ampelisca hancocki	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	4	0	0	0	0	0	0	0	0	0	0
Ampelisca lobata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Ampelisca unsocalae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Aoroides columbiae?	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aoroides intermedius?	0	0	0	0	0	0	12	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aoroides spp.	6	4	2	29	12	2	356	99	66	10	0	6	0	1	0	1	0	0	0	0	48	12	0	0	0	0	5	1
Byblis veleronis	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caprella laeviuscula?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Cheirimedeia zotea	0	0	0	0	0	0	304	97	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corophium insidiosum?	0	0	0	0	0	2	32	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deutella californica	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dexamonica reduncans	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0
Dulichia rhabdoplastis?	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyopedos sp. (monacanthus?)	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ericthonius hunteri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foxiphalus cognatus-similis	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterophoxus oculatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8	0	0	0	0	0	0	19	10
Ischyrocerus anguipes group	14	16	1	0	3	0	12	26	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Isopoda (Limnoria?)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kermystheus ociosa	4	3	0	0	0	0	36	28	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidepecreum gurjanovae	0	0	0	0	0	0	8	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lysianassidae (Wecomedon?)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mayerella banksia	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	48	0	8	8	8	0	0	0	0	1	0	0
Melita dentata	2	0	0	6	0	0	0	23	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melita desdichada	1	1	1	1	3	0	72	8	6	3	0	0	0	0	0	1	0	0	8	4	0	12	0	0	0	0	0	0
Melphisana bola	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microjassa litotes	3	0	0	0	0	0	32	0	0	0	8	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	1
Monoculodes zernovi?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Oedicerotidae, unident.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Orchomene decipiens	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
MYSIDACEA																												
Neomysis kadiakensis	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Pacifacanthomysis nephrophth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
SIPUNCULIDA																												
Golfingia or Nephosoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APLACOPHORA																												
Chaetoderma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEMERTEA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOLOTHUROIDEA																												
Molpadia intermedia	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentamera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OPHIUROIDEA																												
Ophiura sp. juv.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphiodia urtica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphiodia sp.	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AMPHIPODA																												
Accedomoera vagor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ampelisca hancocki	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ampelisca lobata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ampelisca unsocalae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aoroides columbiae?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aoroides intermedius?	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aoroides spp.	24	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Byblis veleronis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caprella laeviuscula?	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheirimedeia zotea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corophium insidiosum?	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Deutella californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dexamonica reduncans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dulichia rhabdoplastis?	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyopedos sp. (monacanthus?)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ericthonius hunteri	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foxiphalus cognatus-similis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterophoxus oculatus	0	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ischyrocerus anguipes group	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Isopoda (Limnoria?)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kermystheus ociosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidepecreum gurjanovae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lysianassidae (Wecomedon?)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mayerella banksia	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melita dentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melita desdichada	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melphisana bola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microjassa litotes	76	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monoculodes zernovi?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oedicerotidae, unident.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orchomene decipiens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

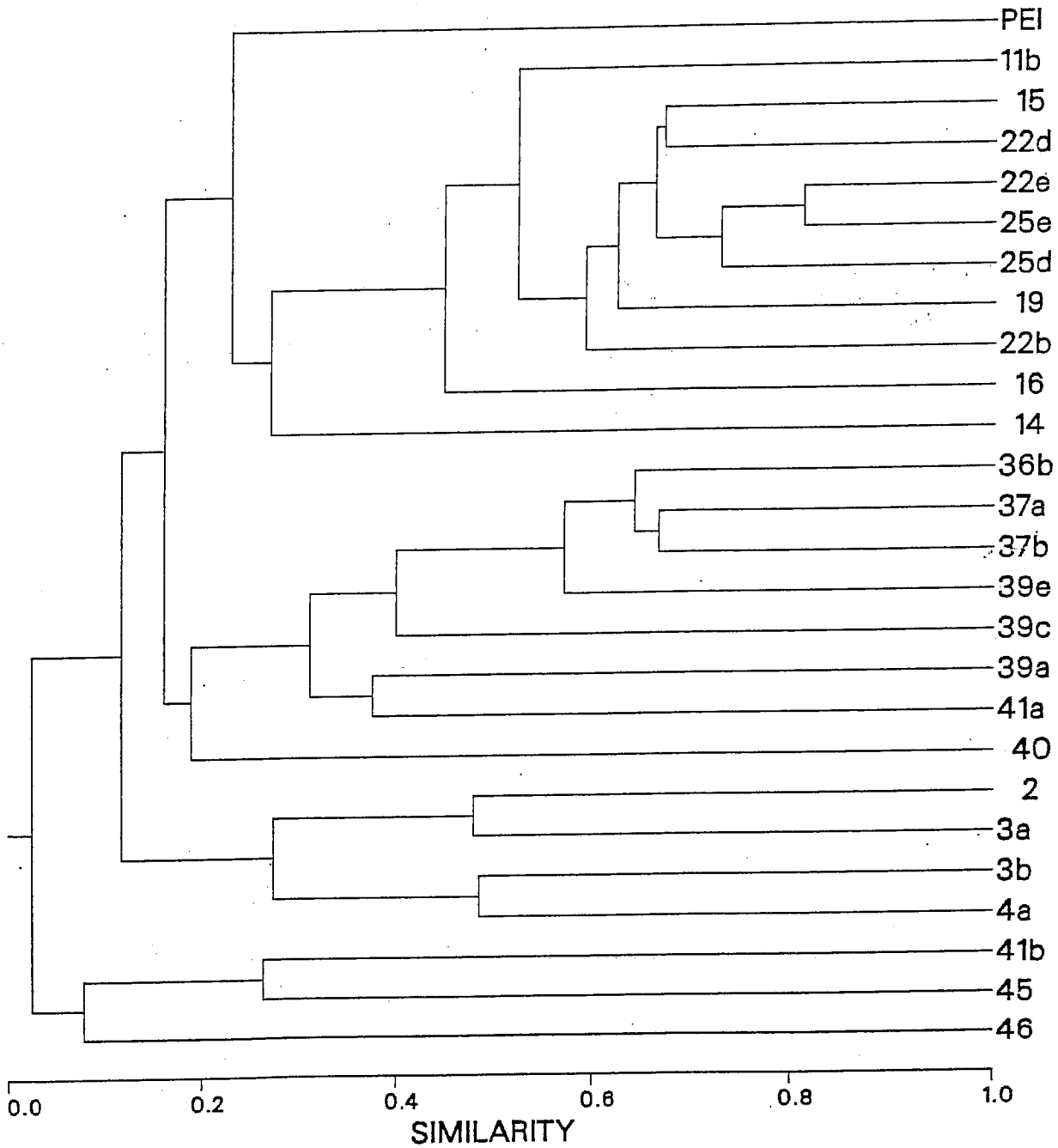
STATION	1		2		3a		3b		4a		11b		14		15		16		19		22b		22d		22e		PEI	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Pachynus barnardi	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parapleustes? sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Photis macinerneyi?	0	0	0	0	0	0	4	1	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photis pachydactyla?	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photis sp.	0	1	0	6	6	4	12	3	30	17	16	9	4	2	0	1	0	0	0	4	8	4	0	0	6	0	0	0
Pleusirus secorrus	5	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleustes depressa group	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pontogeneia cf. rostrata	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prachynella lodo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	1	0
Protomedeia sp.	0	0	0	0	0	0	0	0	6	7	0	0	0	0	0	0	0	8	8	8	0	0	0	0	0	0	0	0
Protomedeia-Cheirimedeia	1	1	0	2	0	1	40	28	0	0	0	0	0	0	0	1	0	0	0	0	16	4	0	0	6	0	0	0
Rhepoxynius variatus	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenothoidae	6	6	1	1	0	0	40	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchelidium rectipalmum	1	1	3	1	0	0	8	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchelidium shoemakeri	0	0	0	0	0	0	0	0	6	0	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Tiron biocellata	1	2	0	5	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tritella pilimana	21	12	0	4	0	0	48	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
unident. Gammaroidea	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westwoodila caecula	0	0	0	0	6	1	0	0	0	1	0	3	0	0	0	1	0	4	0	8	0	0	0	0	0	0	0	0
OLIGOCHAETA																												
Limnodriloides victoriensis	0	0	0	0	0	0	0	0	0	0	128	30	12	2	5	16	96	52	56	56	56	0	4	9	96	4	0	0
Limnodriloides barnardi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	15
Tectidrilus diversus	0	0	0	0	0	0	0	0	6	0	0	3	28	5	0	1	0	8	0	0	216	53	0	0	0	0	0	0
Tubificoides benedii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	2	0	0
Tubificoides bakeri	0	0	0	0	0	0	0	0	0	0	80	15	0	0	15	5	48	4	4	0	8	9	0	0	0	2	0	0
Tubificoides pseudogaster	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	8	0	0	0	0	0	0	0	0	0	0
Enchytraeidae indet.	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	25b		25d		25e		36b		37a		37b		39a		39c		39e		40		41a		41b		45		46	
REPLICATE	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Pachynus barnardi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parapleustes? sp.	2	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photis macinerneyi?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photis pachydactyla?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photis sp.	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleusirus secorrus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleustes depressa group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pontogeneia cf. rostrata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prachynella lodo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protomedeia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protomedeia-Cheirimedeia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhepoxynius variatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenothoidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchelidium rectipalmum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Synchelidium shoemakeri	0	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tiron biocellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tritella pilimana	20	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
unident. Gammaroidea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westwoodila caecula	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OLIGOCHAETA																												
Limnodriloides victoriensis	0	0	0	20	72	88	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnodriloides barnardi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tectidrilus diversus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tubificoides benedii	0	198	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tubificoides bakeri	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tubificoides pseudogaster	4	41	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enchytraeidae indet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix D. Sigtree analysis for Vancouver Harbour species abundance data.

Linkage	Clusters Linked		Similarity	Probability
1	22e	25e	0.81	0.50
2	22e	25d	0.73	0.58
3	1	2	0.69	0.20
4	15	22d	0.67	0.38
5	37a	37b	0.67	0.28
6	15	22e	0.66	0.68
7	36b	37a	0.64	0.24
8	15	19	0.62	0.60
9	15	22b	0.59	0.42
10	36b	39e	0.57	0.16
11	11b	15	0.52	0.14
12	3b	4a	0.49	0.32
13	11b	16	0.45	0.16
14	36b	39c	0.40	0.04
15	1	3a	0.40	0.12
16	39a	41a	0.38	0.34
17	1	25b	0.31	0.10
18	36b	39a	0.31	0.18
19	1	3b	0.28	0.24
20	11b	14	0.27	0.02
21	41b	45	0.26	0.32
22	11b	PEI	0.23	0.02
23	36b	40	0.19	0.12
24	11b	36b	0.16	0.06
25	1	11b	0.11	0.04
26	41b	46	0.08	0.38
27	1	41b	0.02	0.08

APPENDIX E. Comtree comparison of abundance data with sediment particle size data (Fowlkes-Mallows test statistic). Preceding this is a revised abundance dendrogram for comparison with Figure 5, since sediment data was unavaialbel for two stations.


PEI
11b
15
22d
22e
25e
25d
19
22b
16
14
36b
37a
37b
39e
39c
39a
41a
40
2
3a
3b
4a
41b
45
46
0.0
0.2
0.4
0.6
0.8
1.0
SIMILARITY

Number of objects clustered = 26

TREE 1 read from: [brinkhurst.van]vdatsed.cml
TREE 2 read from: vansed.cml

	TREE 1 Linkages		TREE 2 Linkages	
Linkage (i)	A(i)	B(i)	A(i)	B(i)
1	22e	25e	PEI	36b
2	22e	25d	41a	41b
3	15	22d	PEI	37b
4	37a	37b	37a	39e
5	15	22e	41a	46
6	36b	37a	39a	45
7	15	19	PEI	41a
8	15	22b	3a	25d
9	36b	39e	PEI	39c
10	11b	15	2	3b
11	3b	4a	16	19
12	2	3a	37a	40
13	11b	16	4a	22b
14	36b	39c	15	25e
15	39a	41a	PEI	39a
16	36b	39a	22d	22e
17	2	3b	11b	16
18	11b	14	PEI	37a
19	41b	45	3a	15
20	PEI	11b	2	14
21	36b	40	3a	11b
22	PEI	36b	2	4a
23	PEI	2	PEI	22d
24	41b	46	PEI	3a
25	PEI	41b	PEI	2

Fowlkes-Mallows Statistic

L1	L2	FM(L1,L2)	PROB	M1	S1	M2	S2
1	1	0.000000	1.0000	0.003077	0.055385	0.003077	0.055385
2	2	0.000000	1.0000	0.003333	0.040689	0.007537	0.054956
3	3	0.000000	1.0000	0.003623	0.029878	0.012308	0.055631
4	4	0.000000	1.0000	0.003953	0.027837	0.015385	0.054954
5	5	0.000000	1.0000	0.004527	0.025629	0.027000	0.056254
6	6	0.098058	0.0381	0.003831	0.019254	0.031379	0.054818
7	7	0.057166	0.9947	0.068859	0.021272	0.053824	0.065910
8	8	0.048113	0.9942	0.058334	0.019130	0.063953	0.066678
9	9	0.078567	0.1111	0.046159	0.017436	0.078326	0.067504
10	10	0.068599	0.9926	0.080477	0.016960	0.089707	0.068034
11	11	0.066299	0.8167	0.071634	0.015900	0.092819	0.065276
12	12	0.062994	0.7143	0.069298	0.016824	0.097689	0.062079
13	13	0.083984	0.2088	0.068300	0.017196	0.109911	0.061875
14	14	0.158114	0.0769	0.115030	0.016770	0.116761	0.058598
15	15	0.150756	0.3333	0.137757	0.019694	0.142870	0.063201
16	16	0.271704	0.0182	0.176675	0.024673	0.158544	0.058718
17	17	0.312413	0.2667	0.303783	0.029085	0.167431	0.054044
18	18	0.369898	0.9167	0.395419	0.039858	0.224594	0.057583
19	19	0.397569	0.5357	0.390073	0.040975	0.232180	0.053714
20	20	0.368161	0.8571	0.396548	0.051098	0.250727	0.052521
21	21	0.505525	0.2000	0.449269	0.045369	0.279983	0.045154
22	22	0.431571	1.0000	0.516839	0.057348	0.406387	0.043503
23	23	0.494222	1.0000	0.527884	0.037143	0.541643	0.033737
24	24	0.699482	1.0000	0.738414	0.032267	0.730210	0.037014
25	25	1.000000	1.0000	1.000000	0.000000	1.000000	0.000000

PROB = probability given the clusters defined at level L1-1
M1 = mean given the clusters at level L1-1
S1 = standard deviation given the clusters at level L1-1
M2 = mean given the cluster sizes
S2 = standard deviation given the cluster sizes

APPENDIX F. Comtree comparison of abundance data with depth data (Fowlkes-Mallows test statistics).

Number of objects clustered = 28

TREE 1 read from: [brinkhurst.van]vansig.cml
TREE 2 read from: [brinkhurst.van]vandep.cml

	TREE 1 Linkages		TREE 2 Linkages	
Linkage (i)	A(i)	B(i)	A(i)	B(i)
1	22e	25e	39c	39e
2	22e	25d	39a	46
3	1	2	36b	37c
4	15	22d	22d	25e
5	37a	37c	22b	39a
6	15	22e	19	25b
7	36b	37a	11b	14
8	15	19	3b	39c
9	15	22b	2	45
10	36b	39e	15	22e
11	11b	15	4a	16
12	3b	4a	22d	25d
13	11b	16	36b	37a
14	36b	39c	2	3b
15	1	3a	4a	19
16	39a	41a	3a	22b
17	1	25b	1	40
18	36b	39a	15	22d
19	1	3b	41a	41b
20	11b	14	2	3a
21	41b	45	2	36b
22	11b	PEI	1	41a
23	36b	40	11b	15
24	11b	36b	1	2
25	1	11b	4a	11b
26	41b	46	1	4a
27	1	41b	1	PEI

Fowlkes-Mallows Statistic

L1	L2	FM(L1,L2)	PROB	M1	S1	M2	S2
1	1	0.000000	1.0000	0.002646	0.051366	0.002646	0.051366
2	2	0.000000	1.0000	0.002849	0.037635	0.006480	0.051025
3	3	0.000000	1.0000	0.002665	0.027607	0.009164	0.050852
4	4	0.000000	1.0000	0.002866	0.024715	0.011831	0.050734
5	5	0.000000	1.0000	0.003465	0.023369	0.015873	0.050741
6	6	0.109109	0.0277	0.003783	0.022509	0.024246	0.050268
7	7	0.188982	0.0303	0.099177	0.017425	0.027997	0.049629
8	8	0.145095	0.9857	0.163071	0.017631	0.036466	0.049421
9	9	0.120605	0.9895	0.135459	0.015224	0.043871	0.048107
10	10	0.163663	0.9064	0.169763	0.013168	0.048493	0.047293
11	11	0.140642	0.9804	0.154847	0.012923	0.056431	0.045633
12	12	0.215166	0.7206	0.214330	0.012153	0.061476	0.045624
13	13	0.255945	0.9750	0.276331	0.013478	0.072353	0.044199
14	14	0.240772	0.0857	0.217603	0.011658	0.087901	0.047809
15	15	0.244949	0.8132	0.246951	0.013568	0.097202	0.046795
16	16	0.230089	0.6410	0.230472	0.013256	0.103479	0.045962
17	17	0.219971	0.7727	0.224786	0.014009	0.108240	0.045064
18	18	0.308248	0.9818	0.328411	0.015827	0.128736	0.044087
19	19	0.325006	0.0444	0.299975	0.014219	0.138378	0.043313
20	20	0.320971	0.7222	0.323565	0.017487	0.181328	0.045112
21	21	0.371317	0.5714	0.374626	0.028877	0.220864	0.045663
22	22	0.342588	0.8571	0.366713	0.033254	0.239385	0.044142
23	23	0.424242	0.6667	0.431172	0.037292	0.261905	0.040009
24	24	0.398075	1.0000	0.495150	0.061788	0.438619	0.048634
25	25	0.583852	0.1667	0.487664	0.045087	0.607170	0.022720
26	26	0.855518	1.0000	0.890423	0.028744	0.862746	0.020865
27	27	1.000000	1.0000	1.000000	0.000000	1.000000	0.000000

PROB = probability given the clusters defined at level L1-1
M1 = mean given the clusters at level L1-1
S1 = standard deviation given the clusters at level L1-1
M2 = mean given the cluster sizes
S2 = standard deviation given the cluster sizes

APPENDIX G. Comtree comparison of abundance data with sediment chemistry (Fowlkes-Mallows test statistics).

Number of objects clustered = 28

TREE 1 read from: [brinkhurst.van]vansig.cml
TREE 2 read from: [brinkhurst.van]vanchem2.cml

	TREE 1 Linkages		TREE 2 Linkages	
Linkage (i)	A(i)	B(i)	A(i)	B(i)
1	22e	25e	25d	25e
2	22e	25d	22d	22e
3	1	2	39c	39e
4	15	22d	37a	39c
5	37a	37c	36b	37c
6	15	22e	11b	16
7	36b	37a	14	19
8	15	19	36b	37a
9	15	22b	25b	40
10	36b	39e	11b	PEI
11	11b	15	14	15
12	3b	4a	39a	41a
13	11b	16	36b	46
14	36b	39c	22b	22d
15	1	3a	3a	3b
16	39a	41a	25b	39a
17	1	25b	25d	36b
18	36b	39a	11b	14
19	1	3b	25b	25d
20	11b	14	3a	4a
21	41b	45	22b	25b
22	11b	PEI	22b	45
23	36b	40	22b	41b
24	11b	36b	2	3a
25	1	11b	11b	22b
26	41b	46	2	11b
27	1	41b	1	2

Fowlkes-Mallows Statistic

L1	L2	FM(L1,L2)	PROB	M1	S1	M2	S2
1	1	0.000000	1.0000	0.002646	0.051366	0.002646	0.051366
2	2	0.408248	0.0057	0.002326	0.030729	0.006480	0.051025
3	3	0.288675	0.9262	0.286213	0.023685	0.009164	0.050852
4	4	0.200000	0.8467	0.198658	0.023803	0.013228	0.051065
5	5	0.166667	0.7645	0.165521	0.022261	0.015873	0.050741
6	6	0.218218	0.0237	0.141980	0.020532	0.024246	0.050268
7	7	0.283473	0.0260	0.194942	0.017307	0.027997	0.049629
8	8	0.306570	0.9857	0.340815	0.024234	0.043147	0.055102
9	9	0.258199	0.9895	0.286184	0.020991	0.051230	0.055041
10	10	0.366679	0.0117	0.236938	0.018755	0.057718	0.052950
11	11	0.349005	0.9804	0.378900	0.020760	0.068221	0.052129
12	12	0.335410	0.6985	0.332267	0.018099	0.070986	0.050713
13	13	0.301511	0.0750	0.293834	0.020495	0.087741	0.053798
14	14	0.444444	0.0190	0.341089	0.020625	0.095238	0.051228
15	15	0.427618	0.7473	0.425614	0.022559	0.098986	0.049609
16	16	0.420813	0.0897	0.390567	0.023532	0.106873	0.047949
17	17	0.348759	0.7273	0.351617	0.021421	0.128953	0.050702
18	18	0.360571	0.9273	0.384258	0.024039	0.154076	0.047217
19	19	0.409048	0.7111	0.415752	0.022316	0.206959	0.047304
20	20	0.452670	0.1111	0.425734	0.024165	0.222080	0.046410
21	21	0.438120	0.5714	0.441929	0.034919	0.265685	0.044911
22	22	0.434873	0.3333	0.421994	0.036568	0.298086	0.044146
23	23	0.461633	0.2667	0.437227	0.040142	0.326653	0.039486
24	24	0.583619	0.1000	0.496494	0.050458	0.453293	0.052113
25	25	0.705559	1.0000	0.810040	0.058205	0.738654	0.040363
26	26	0.855518	1.0000	0.890423	0.028744	0.862746	0.020865
27	27	1.000000	1.0000	1.000000	0.000000	1.000000	0.000000

PROB = probability given the clusters defined at level L1-1
M1 = mean given the clusters at level L1-1
S1 = standard deviation given the clusters at level L1-1
M2 = mean given the cluster sizes
S2 = standard deviation given the cluster sizes