

HUM-MS-ECF-REP-0009\_01--BMP Annual  
Report Technical Appendix 1 Benthic Survey  
Results

**E.ON Climate and Renewables UK Limited**

**Humber Gateway Offshore Wind Farm:  
Benthic Monitoring Programme  
Annual Report Technical Appendix -  
Benthic Survey Results**

**Date: May 2013**

**Project Ref: P012-07-0053/EON/Ann1**

**Contract Ref: HG-1106**

**Project Name: Humber Gateway Offshore Wind Farm:  
Benthic Monitoring Programme Annual Report Technical  
Appendix – Benthic Survey Results**

**Client Name: E.ON Climate and Renewables UK Limited**

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# **Report Title: Humber Gateway Offshore Wind Farm: Benthic Monitoring Programme Annual Report Technical Appendix – Benthic Survey Results**

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## **1. Introduction**

Humber Gateway Offshore Wind Farm (OWF) has been awarded full planning consent for construction and operation of the wind farm off the Holderness Coast. The Marine Licence issued to HWL in February 2013 (which replaces FEPA and CPA licences awarded in February 2011) requires HWL to undertake Benthic and Annex I survey during the preconstruction phase of the OWF development. Precision Marine Survey Limited (PMSL) has undertaken the Benthic and Annex I surveys on behalf of Humber Gateway Limited (HWL) and a summary of the 2011/2012 geophysical/bathymetric survey and Annex I surveys were provided in the Preconstruction BMP Annual Report issued in May 2013. Due to delays to the benthic survey (which was completed in spring 2013) the results of infaunal analysis were not available for inclusion in the BMP Annual Report which instead included a debrief of the completed benthic survey, including the methodology, location of survey sites and sampling. It was agreed with the Marine Management Organisation that the results of the benthic survey would be provided once they became available, as now presented in this technical appendix.

## **2. Survey Summary**

### **2.1 Objectives**

The benthic survey aimed to provide an assessment of the status of benthic communities and associated sediment parameters within the wind farm and adjacent habitats including those potentially subject to construction related disturbance. This entailed survey by grab sampling and drop down video using appropriate techniques to define benthic communities and sediment parameters in the vicinity of the development and allow a comparison of temporal trends for any future (post construction) monitoring. The methodologies employed for the survey are outlined in detail in the Preconstruction BMP Annual Report and included the following:

- Sample collection using 0.1m<sup>2</sup> Hamon grab with a 1mm sieve
- Drop down video (in addition to that undertaken for the Annex I survey) to provide additional information on the epibenthic assemblage
- Sediment sampling and Particle size analysis (PSA)
- Faunal preservation, processing and enumeration

### **2.2 Survey Design**

The benthic survey design utilised a stratified random layout as outlined in the HWL Benthic Monitoring Programme (BMP) and reported in the Preconstruction BMP Annual Report in which the benthic sampling stations are sited in each of the main benthic habitats within and adjacent to the development site. The survey included a combination of single and triplicate infaunal samples from 40 sites (18 with triplicate infaunal samples and 22 with single infaunal samples) with a sediment sample also taken for Particle Size Analysis (PSA) at each site.



## 2.3 Survey Details

The surveys were undertaken using the survey vessel *Precision 1* on the 10<sup>th</sup> and 17<sup>th</sup> January, 3<sup>rd</sup>, 5<sup>th</sup> and 6<sup>th</sup> March and 11<sup>th</sup> April 2013. Water quality and tidal conditions were not ideal for video survey during the benthic survey so for purposes of providing additional information on seabed sediments and epibenthic communities for future assessment following construction the drop down video survey was repeated during neap tides on the 20<sup>th</sup> to 22<sup>nd</sup> April 2013. The locations of the benthic samples are provided in **Figure 1** and detailed in Appendix 1. Representative samples were taken at all sites although particularly low sample volumes (<2 litres) were collected at sites 20 and 42 due to seabed conditions (harder ground or coarse mixed sediments with frequent/patchy cobble). However, these samples were representative of the surficial sediments in the area and the samples have been processed and included in the final dataset. Photographs of the benthic samples are provided in Appendix 2 and representative stills of the seabed from drop down video survey are provided in Appendix 3. Species data is provided in Appendix 4.

## 3. Results

### 3.1 Sediment Characteristics

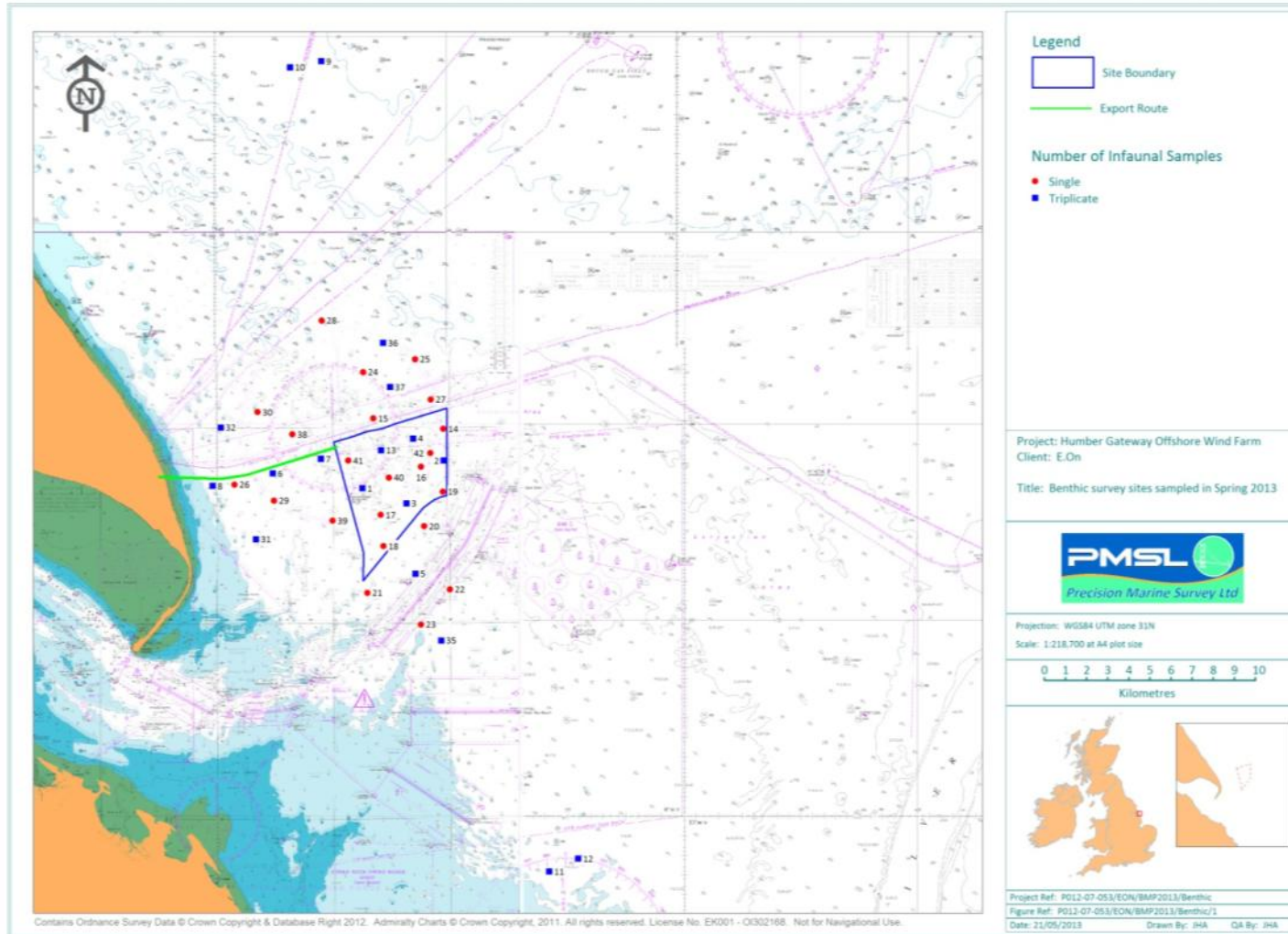
The results of Particle Size Analysis are provided in Appendix 5 with key parameters given in **Table 1** and **Figures 2 to 5**. The sediments at the survey sites exhibit a degree of variability reflecting the heterogeneous nature of the seabed in the study area but are for the most part characterised by coarse mixed sediments comprising of gravel or sandy gravel with stones and shell and varying quantities of coarser substrata such as small cobble or large pebbles along with a variable but generally low mud content. Gravel content is generally high ranging from 41% at site 9 to over 99% at site 42 which was characterised by harder ground which hampered sampling resulting in limited quantities of soft sediment were recovered in the grab. The majority of sites had gravel contents in excess of 60% whilst sand content varied from 0.18% (site 42) to 51% (site 9). Mud content was typically quite low (<2%) and ranged from 0% at site 42 to 11.26% at site 26. The textural groups derived from PSA comprised of three main groups with sites 4, 7, 8, 9, 15, 16, 27, 29 and 40 classified as muddy sandy gravels and the remaining sites classified as either gravel or sandy gravel. Levels of organic matter were generally low (<2%) as might be expected in an area dominated by coarse sediments.

Almost all sites had negative mean and median phi grain sizes highlighting the coarse nature of the sediments and values of the sorting coefficient were generally above 1 and often in excess of 2 indicating poorly or very poorly sorted sediments. With the exception of sites 5 and 9 (coarse skewed) and sites 10 and 38 (symmetrical) the majority of sites were characterised by fine or very finely skewed sediments. As illustrated by the examples of seabed habitats in Appendix 3 the majority of the survey area is characterised by such sediments often present as a veneer over underlying boulder clay which can hamper sampling. Cobbles were identified during grab sampling and from the video assessment and occurred in varying quantities at many sites but were generally patchy with much of the coarser fraction in the pebble size range with only occasional small cobble picked up in the

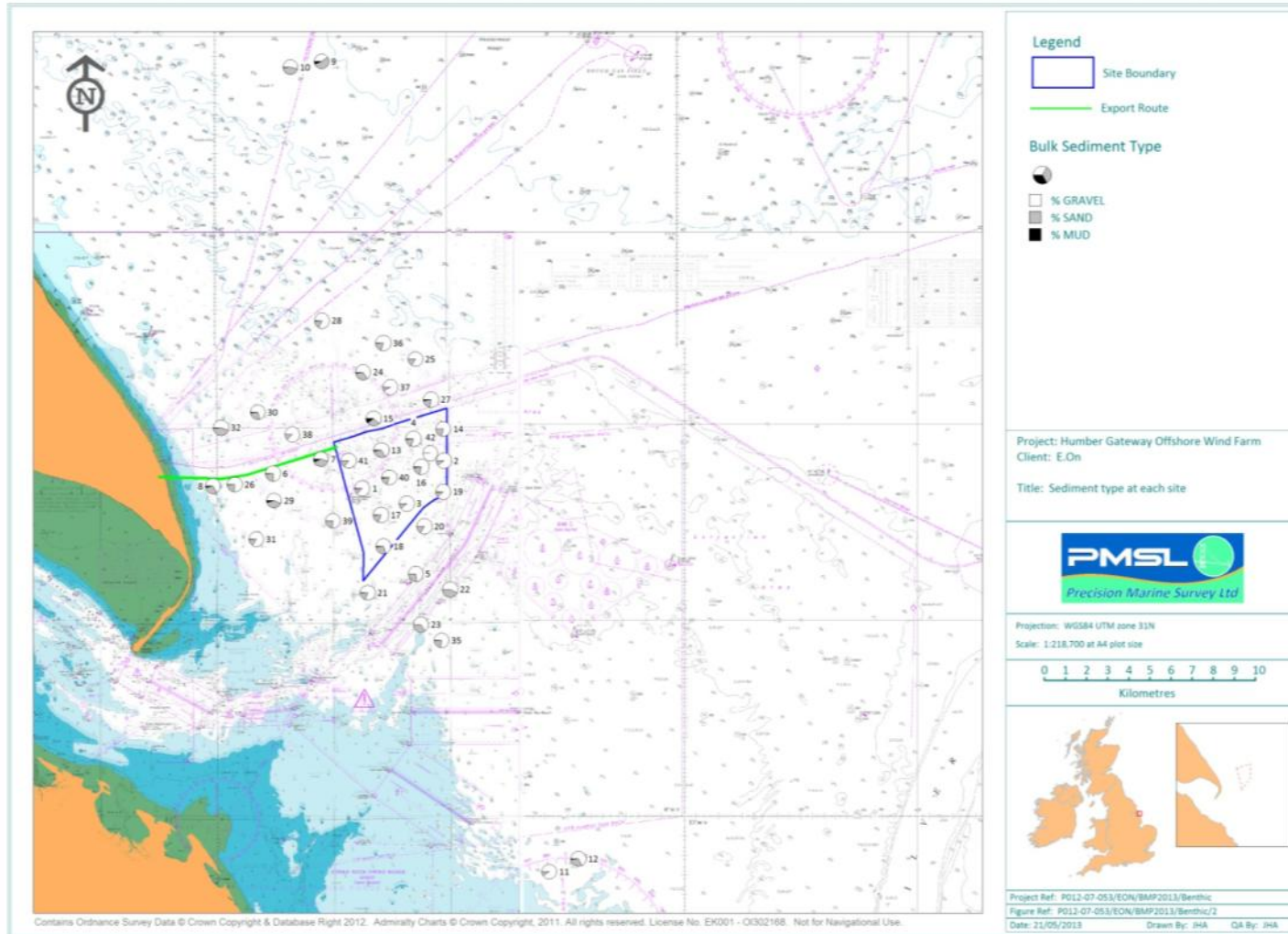
grabs. **Figure 6** shows the distribution of the very coarse gravel fraction which includes cobbles. Certain sites, notably sites 19 and 42 exhibited higher levels of cobble albeit patchy with some small patches of more consolidated cobble and areas of transitional cobble habitat similar to those highlighted during the Annex I survey.

**Table 1. Summary of sediment parameters from Particle Size Analysis**

SITE	TEXTURAL GROUP	MEDIAN GRAIN SIZE (Ø)	MEAN GRAIN SIZE (Ø)	SORTING	SKEWNESS	KURTOSIS	% GRAVEL	% SAND	% MUD	% LOI (ORGANIC CARBON)
1	Gravel	-3.62	-3.28	1.76	0.38	1.02	87.77	10.93	1.30	1.33
2	Gravel	-4.06	-3.58	1.47	0.69	2.08	89.08	10.23	0.69	1.12
3	Gravel	-3.99	-3.44	1.66	0.65	1.59	88.03	10.96	1.01	1.07
4	Muddy Sandy Gravel	-2.79	-2.54	1.94	0.29	1.03	79.56	18.19	2.25	2.10
5	Sandy Gravel	-2.01	-2.40	2.02	-0.17	0.94	73.68	26.27	0.05	1.01
6	Sandy Gravel	-2.93	-2.46	2.48	0.32	0.84	74.79	23.38	1.83	1.26
7	Muddy Sandy Gravel	-1.46	-0.99	3.13	0.32	0.86	54.54	38.15	7.30	1.12
8	Muddy Sandy Gravel	-2.57	-1.82	2.77	0.40	0.90	65.79	30.40	3.81	1.16
9	Muddy Sandy Gravel	0.74	-0.10	3.01	-0.21	0.89	41.17	51.16	7.67	1.63
10	Sandy Gravel	-1.19	-1.29	2.39	-0.02	1.00	53.75	44.48	1.77	1.03
11	Gravel	-4.36	-4.23	2.15	0.28	1.06	89.40	9.92	0.68	1.58
12	Sandy Gravel	-2.40	-1.82	2.27	0.38	0.81	67.79	30.01	2.19	1.09
13	Sandy Gravel	-2.16	-2.13	2.47	0.10	0.92	66.85	30.23	2.92	1.41
14	Sandy Gravel	-2.98	-2.49	1.59	0.46	0.82	78.12	21.14	0.73	1.17
15	Muddy Sandy Gravel	-2.10	-1.17	3.44	0.48	0.95	62.77	25.97	11.26	1.12
16	Muddy Sandy Gravel	-3.58	-2.66	2.17	0.58	1.04	78.31	19.13	2.56	1.73
17	Gravel	-4.45	-3.56	2.50	0.57	0.83	80.48	17.80	1.73	1.87
18	Sandy Gravel	-2.91	-2.16	2.70	0.38	0.74	69.06	28.77	2.17	1.20
19	Gravel	-4.02	-3.43	1.73	0.64	1.68	88.03	10.75	1.22	0.77
20	Gravel	-3.45	-3.05	2.15	0.32	1.32	83.15	16.31	0.54	1.01
21	Sandy Gravel	-3.36	-2.63	2.18	0.54	1.09	79.37	18.68	1.95	0.90
22	Sandy Gravel	-2.12	-1.86	2.75	0.13	0.57	57.29	42.17	0.54	1.31
23	Sandy Gravel	-4.10	-2.79	2.87	0.57	0.56	65.26	33.70	1.05	0.86
24	Sandy Gravel	-3.19	-1.99	2.70	0.58	0.61	64.55	32.97	2.48	3.19
25	Gravel	-4.51	-3.43	1.95	0.85	1.24	83.78	15.21	1.01	1.06
26	Sandy Gravel	-3.72	-2.92	2.29	0.51	0.78	76.32	22.11	1.57	0.74
27	Muddy Sandy Gravel	-3.43	-2.50	2.49	0.58	0.99	77.07	20.11	2.82	1.75
28	Gravel	-4.39	-3.15	2.52	0.71	1.15	81.14	17.15	1.71	1.56
29	Muddy Sandy Gravel	-1.71	-1.28	2.81	0.30	0.77	56.90	37.60	5.50	1.56
30	Sandy Gravel	-2.40	-1.84	2.22	0.39	0.90	71.23	26.69	2.08	1.36
31	Gravel	-4.31	-3.37	2.19	0.70	1.16	83.00	15.27	1.73	1.03
32	Sandy Gravel	-1.43	-1.38	2.22	0.04	0.66	55.41	42.69	1.90	1.44
35	Sandy Gravel	-4.19	-2.78	2.62	0.71	0.99	77.47	21.09	1.43	1.73
36	Sandy Gravel	-3.56	-2.75	2.16	0.59	1.04	79.48	19.03	1.49	1.26
37	Gravel	-4.19	-3.87	1.47	0.52	1.73	91.72	7.96	0.32	2.10
38	Gravel	-2.60	-2.65	1.44	0.02	0.97	87.49	11.65	0.86	1.16
39	Sandy Gravel	-3.18	-2.72	2.45	0.32	0.77	76.71	22.74	0.55	1.02
40	Muddy Sandy Gravel	-3.78	-3.00	2.39	0.53	0.96	78.58	18.65	2.77	1.76
41	Gravel	-4.09	-3.39	2.09	0.55	0.96	83.42	15.94	0.65	1.24
42	Gravel	-6.11	-5.96	0.51	0.53	1.22	99.81	0.18	0.00	-

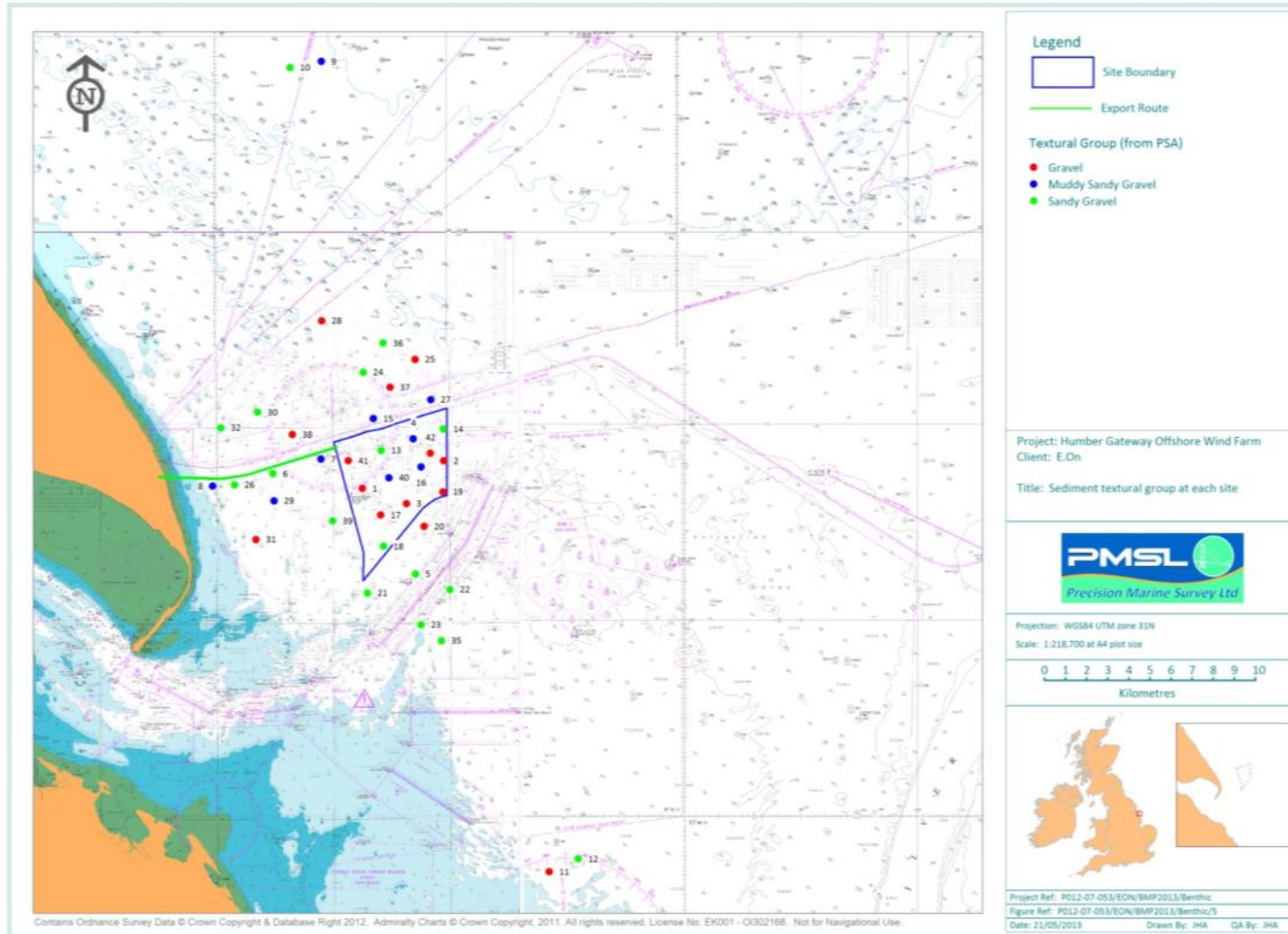


**Figure 1. Benthic sites sampled during survey**



**Figure 2. Bulk sediment parameters from PSA at survey sites**





**Figure 3. Sediment textural groups from PSA at survey sites**

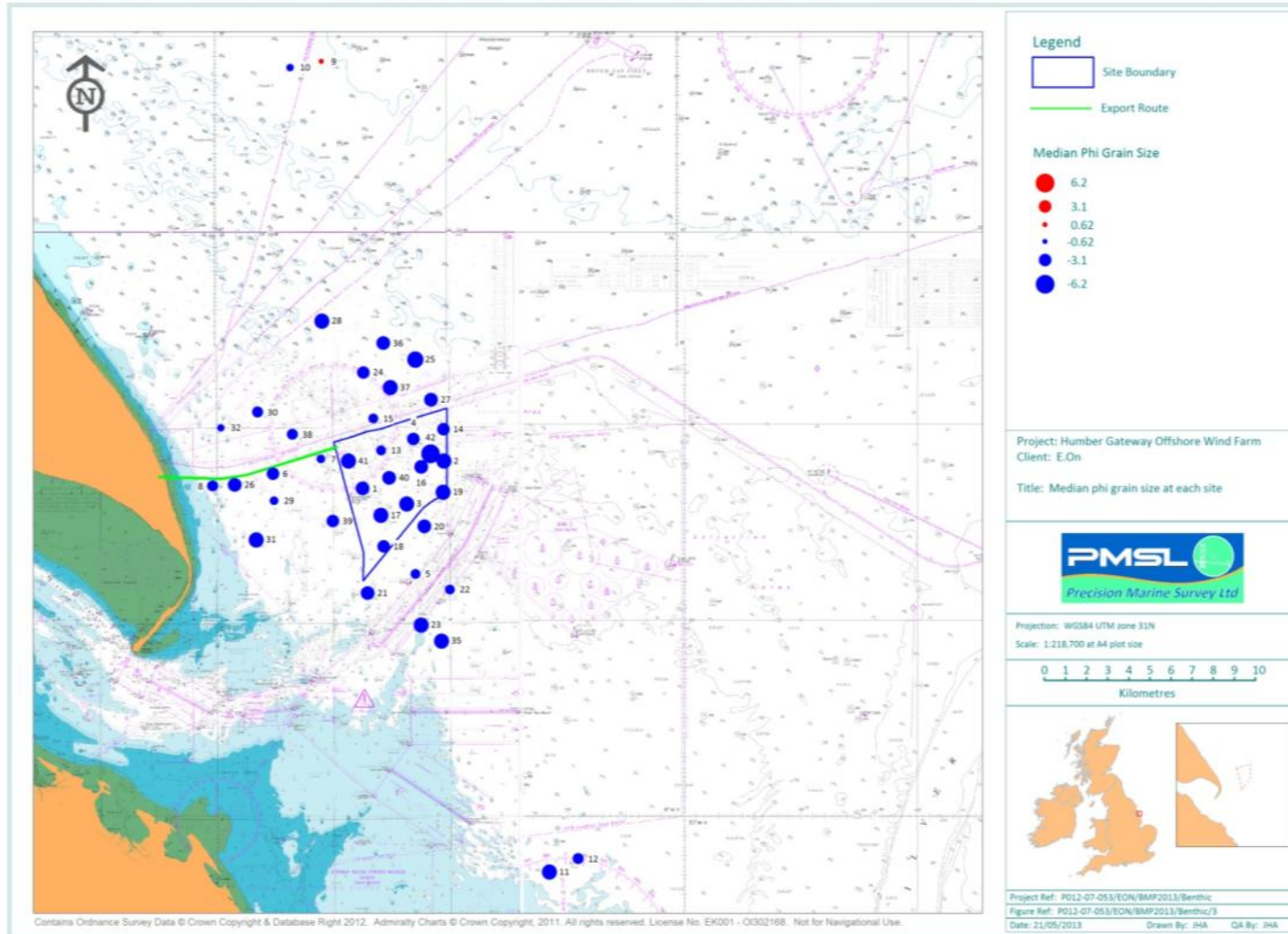


Figure 4. Median phi grain size at survey sites

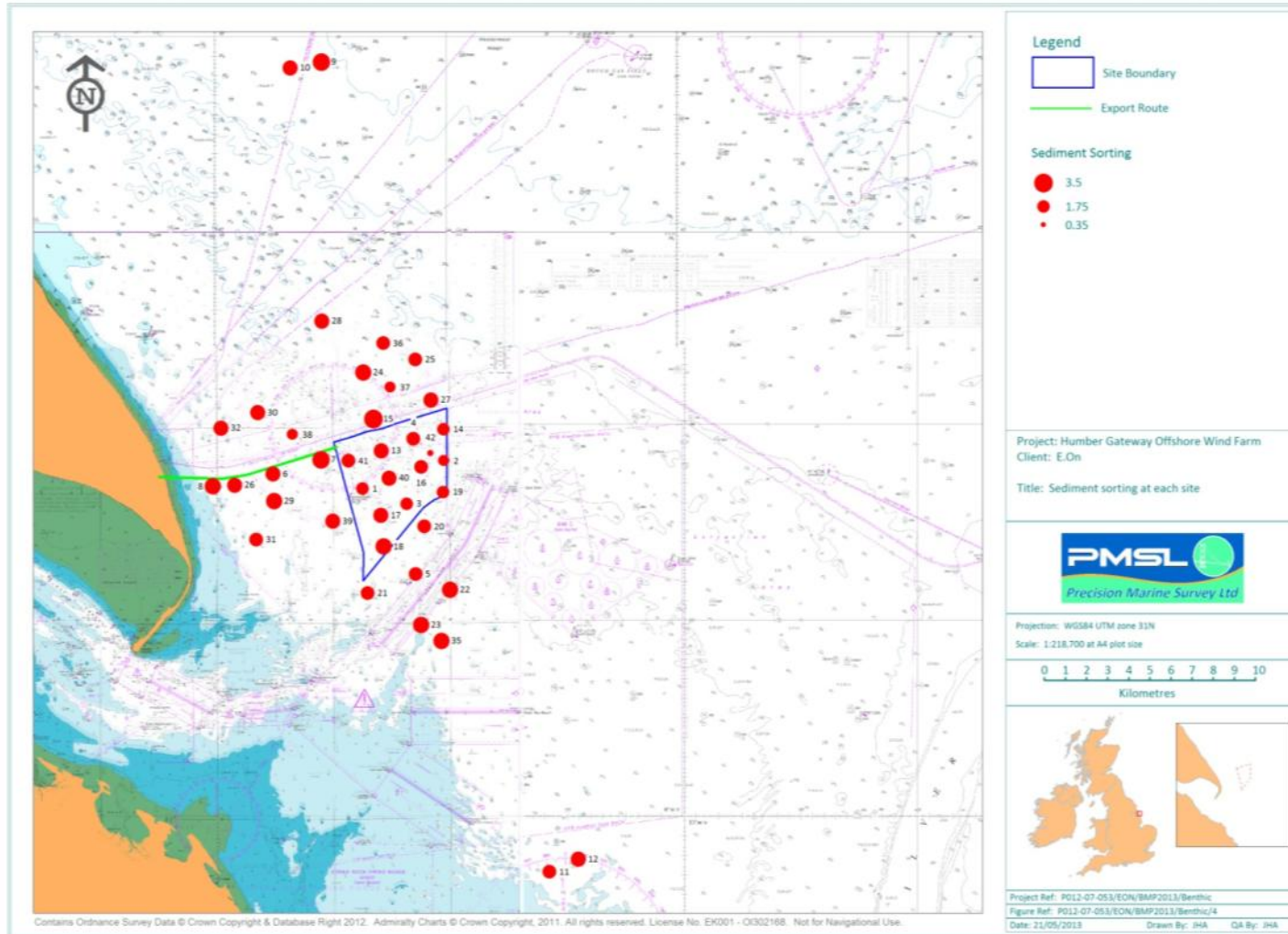


Figure 5. Sediment sorting at survey sites



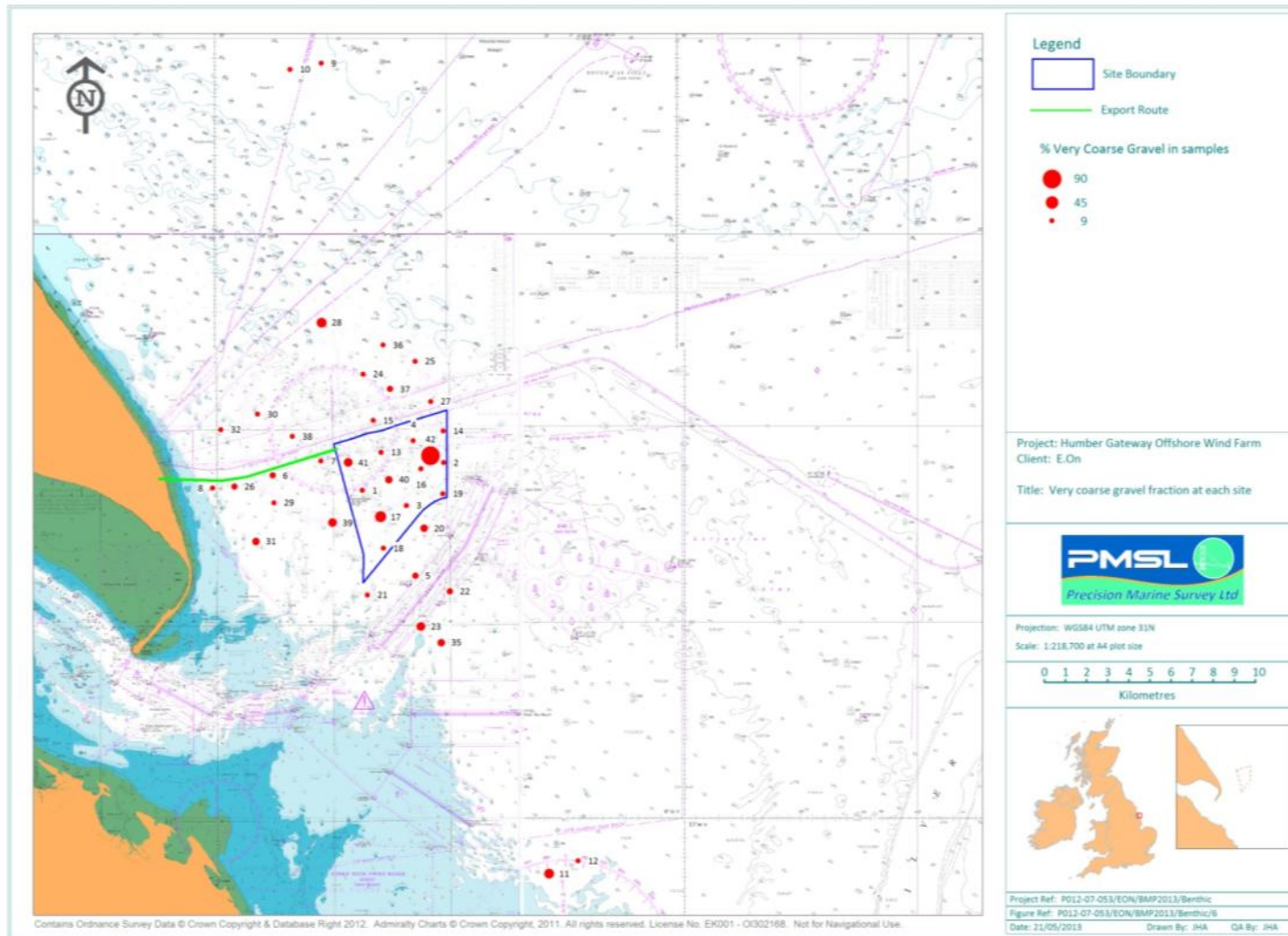


Figure 6. Very coarse gravel fraction at survey sites



### 3.2 Biological Parameters

A number of primary and derived biological parameters values were calculated from the species data tabulated and input into GIS. Standard biological parameters utilised for benthic analysis include the following:

- The total number of taxa at each site/replicate (S)
- The total number of individuals at each site/replicate (N)
- The total biomass (in grams wet weight) at each site/replicate (B)
- Margalef's index of species richness (d)
- Shannon's diversity index (H')

This index is a univariate measure of diversity which incorporates both the number of species and the distribution or equitability of individuals between species. High values of H' indicate a more diverse community whilst low values indicate low diversity.

- Pielou's evenness (J)

This index is a univariate measure of evenness or equitability which describes the distribution of individuals between species. High values of J (approaching 1) indicate that the abundance of animals are evenly spread between species whilst low values of J (approaching 0) indicate that the majority of animals are comprised of a few species, a situation which often occurs in low diversity areas subject to disturbance or organic enrichment.

The primary and derived biological parameters for the survey (per 0.1m<sup>2</sup>) are shown in **Table 2** and the spatial distribution of some of these parameters are plotted in **Figures 7 to 10**.

Overall the numbers of taxa recorded during the survey per sample was highly variable as might be expected in heterogeneous mixed sediment with numbers ranging from 2 (sample 5b) to 89 (sample 37c) and many of the samples had in excess of 40 taxa indicating a moderately rich invertebrate community. Total numbers of individuals also varied considerably ranging from less than 10 individuals at site 5 and site 26 to over 300 (samples 19, 36b and 37c). Biomass per sample tended to be less than 3g at most sites with certain samples (3a, 3b, 7c, 9b, 19, 35b, 36b 37b and 37c) having biomass values above 5g. Diversity values were somewhat variable but generally moderately high with Shannon's H' generally above 3 and in many cases above 4 although some sites (samples 5b and c) had values less than 1. Pielou's evenness values were also generally high and usually above 0.8 although sample 31b had a particularly low value (0.44). There were relatively few clear spatial patterns in biological parameters although numbers of taxa and numbers of individuals tended to be somewhat lower at sites along the export route (and to a lesser extent in the development site).

**Table 2. Biological parameters for each sample**

Sample	Quantitative Taxa (S)	Total Taxa (S)	Number of Individuals (N)	Total Biomass (B)	Margalef's d	Pielou's Evenness (J)	Shannon's diversity H' (log2)
1a	26	39	76	1.798	5.77	0.83	3.91
1b	46	60	127	2.8943	9.29	0.87	4.83
1c	27	44	59	0.5651	6.38	0.88	4.18
2a	30	42	68	1.559	6.87	0.92	4.53
2b	52	72	202	5.3257	9.61	0.80	4.58
2c	33	53	95	2.5227	7.03	0.85	4.30
3a	32	53	149	11.6879	6.20	0.60	2.98
3b	34	48	186	5.1048	6.31	0.66	3.37
3c	33	39	72	0.8989	7.48	0.89	4.50
4a	19	34	41	0.7984	4.85	0.88	3.76
4b	22	41	70	0.9005	4.94	0.88	3.94
4c	19	26	35	0.749	5.06	0.93	3.96
5a	5	8	9	1.1353	1.82	0.89	2.06
5b	2	2	5	0.0092	0.62	0.97	0.97
5c	2	4	4	0.0032	0.72	0.81	0.81
6a	5	7	6	0.1522	2.23	0.97	2.25
6b	16	21	27	0.1757	4.55	0.93	3.74
6c	19	27	39	1.9575	4.91	0.91	3.88
7a	44	59	154	2.3	8.54	0.89	4.86
7b	21	34	31	0.5963	5.82	0.96	4.22
7c	43	56	119	5.6769	8.79	0.80	4.35
8a	6	9	18	0.0601	1.73	0.69	1.79
8b	10	14	18	0.0296	3.11	0.86	2.86
8c	10	13	15	0.1043	3.32	0.86	2.87
9a	36	46	59	0.3175	8.58	0.94	4.88
9b	42	55	99	5.6053	8.92	0.92	4.97
9c	62	70	219	2.4265	11.32	0.85	5.06
10a	39	53	92	1.5076	8.40	0.90	4.73
10b	42	55	168	2.3102	8.00	0.68	3.64
10c	27	38	57	0.945	6.43	0.88	4.16
11a	47	56	153	3.2312	9.14	0.83	4.61
11b	42	61	214	2.8688	7.64	0.79	4.26
11c	41	56	159	1.1061	7.89	0.74	3.99
12a	57	69	215	2.8762	10.43	0.83	4.85
12b	45	52	181	1.463	8.46	0.81	4.45
12c	38	45	124	3.3878	7.68	0.82	4.28
13a	26	41	64	1.439	6.01	0.86	4.04
13b	52	65	198	1.8679	9.64	0.82	4.70
13c	28	39	72	0.4952	6.31	0.91	4.39
14	21	24	45	2.0462	5.25	0.80	3.51
15	59	75	237	4.84348	10.61	0.81	4.79
16	38	53	124	3.2151	7.68	0.88	4.64
17	26	35	68	1.536	5.92	0.90	4.24
18	33	42	78	1.2949	7.34	0.90	4.56
19	58	72	382	11.2467	9.59	0.59	3.43
20	16	26	30	0.6388	4.41	0.95	3.79
21	29	40	75	0.819	6.49	0.82	4.00
22	24	33	83	1.4394	5.20	0.86	3.94

Sample	Quantitative Taxa (S)	Total Taxa (S)	Number of Individuals (N)	Total Biomass (B)	Margalef's d	Pielou's Evenness (J)	Shannon's diversity H' (log2)
23	21	35	73	1.8648	4.66	0.66	2.89
24	37	49	76	1.243	8.31	0.93	4.86
25	32	47	70	2.2659	7.30	0.91	4.54
26	4	13	7	0.0912	1.54	0.83	1.66
27	39	56	172	3.9634	7.38	0.76	4.02
28	62	81	218	2.8365	11.33	0.80	4.77
29	11	16	13	0.2146	3.90	0.98	3.39
30	16	28	21	1.4988	4.93	0.96	3.84
31a	12	17	36	0.1412	3.07	0.85	3.05
31b	7	10	30	3.3303	1.76	0.44	1.24
31c	14	19	27	0.2018	3.94	0.82	3.12
32a	25	38	105	0.6652	5.16	0.52	2.40
32b	17	28	38	0.1453	4.40	0.88	3.61
32c	24	34	63	0.4334	5.55	0.85	3.89
35a	38	49	165	2.7519	7.25	0.83	4.36
35b	49	60	191	19.1773	9.14	0.87	4.88
35c	47	64	234	3.9255	8.43	0.86	4.77
36a	35	49	122	2.5099	7.08	0.81	4.15
36b	66	83	307	5.1634	11.35	0.78	4.71
36c	57	71	208	4.8881	10.49	0.82	4.80
37a	38	55	128	2.6096	7.63	0.82	4.33
37b	42	57	169	6.7857	7.99	0.86	4.65
37c	72	89	368	7.2399	12.02	0.80	4.92
38	15	23	30	0.2184	4.12	0.90	3.51
39	14	27	27	0.6122	3.94	0.87	3.30
40	24	37	53	0.8849	5.79	0.90	4.15
41	25	36	38	3.0508	6.60	0.94	4.38
42	7	19	10	0.0283	2.61	0.90	2.52

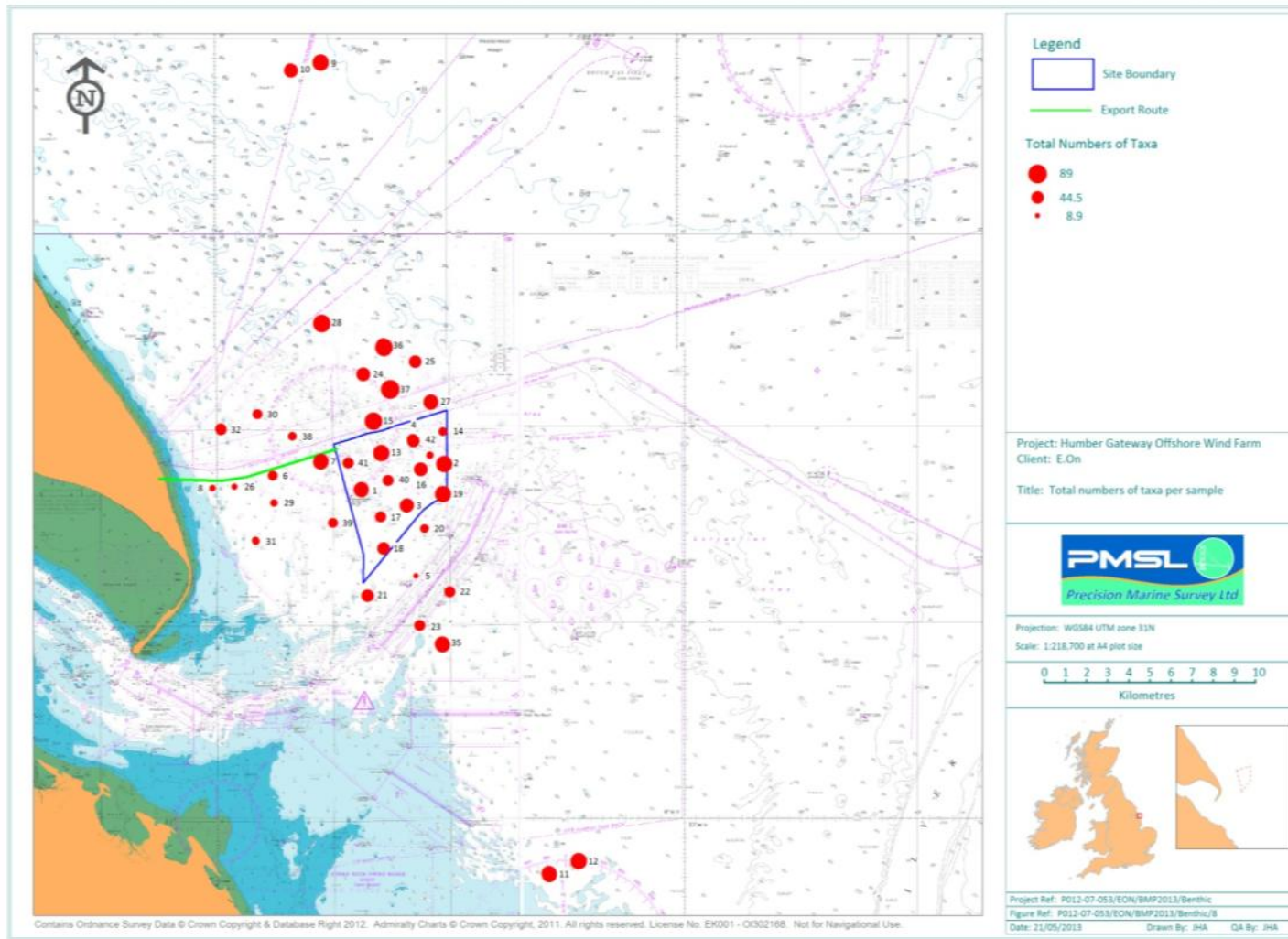


Figure 7. Total numbers of taxa per sample (0.1m<sup>2</sup>)

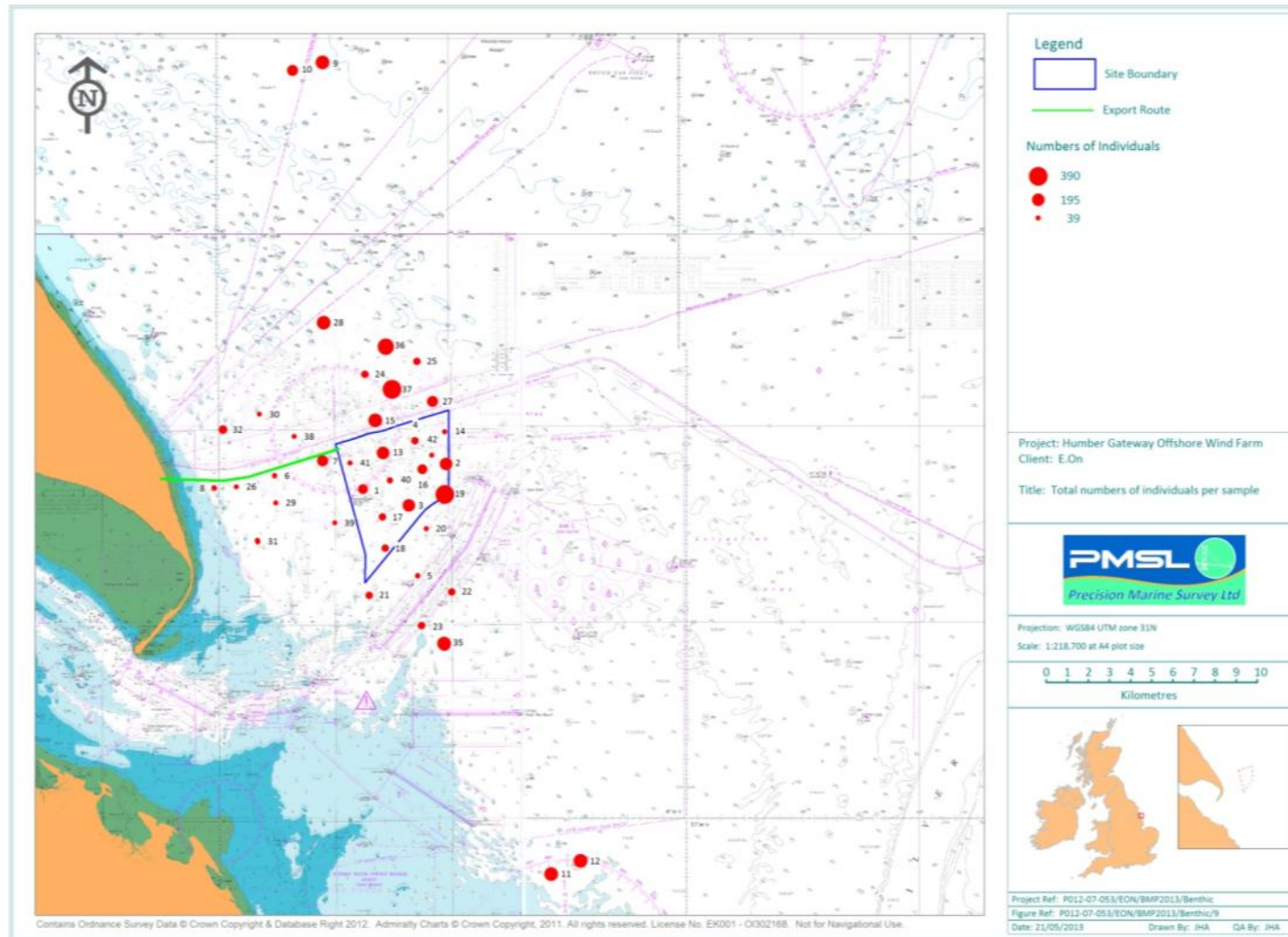


Figure 8. Total numbers of individuals per sample (0.1m<sup>2</sup>)



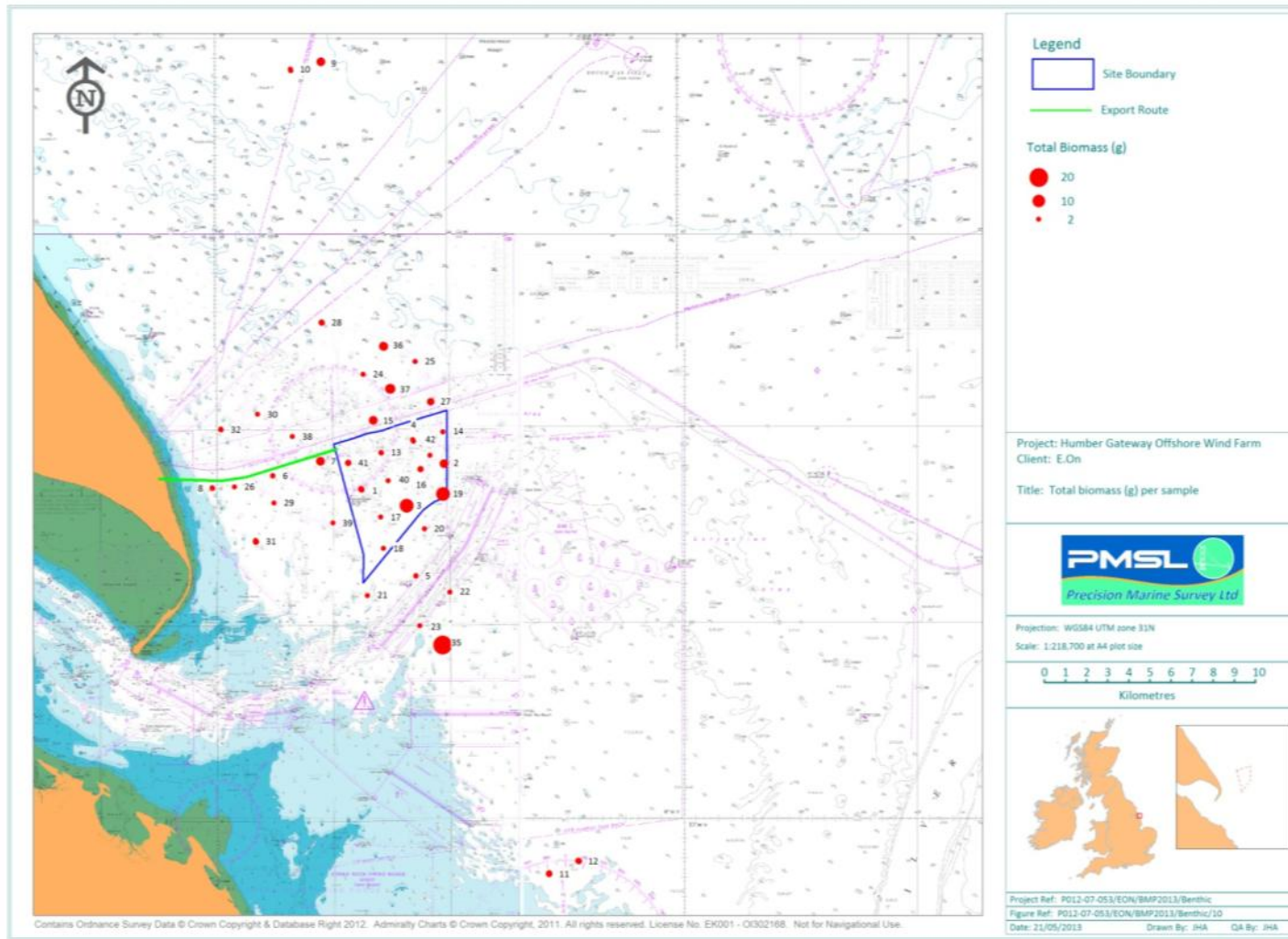


Figure 9. Total biomass (g) per sample (0.1m<sup>2</sup>)

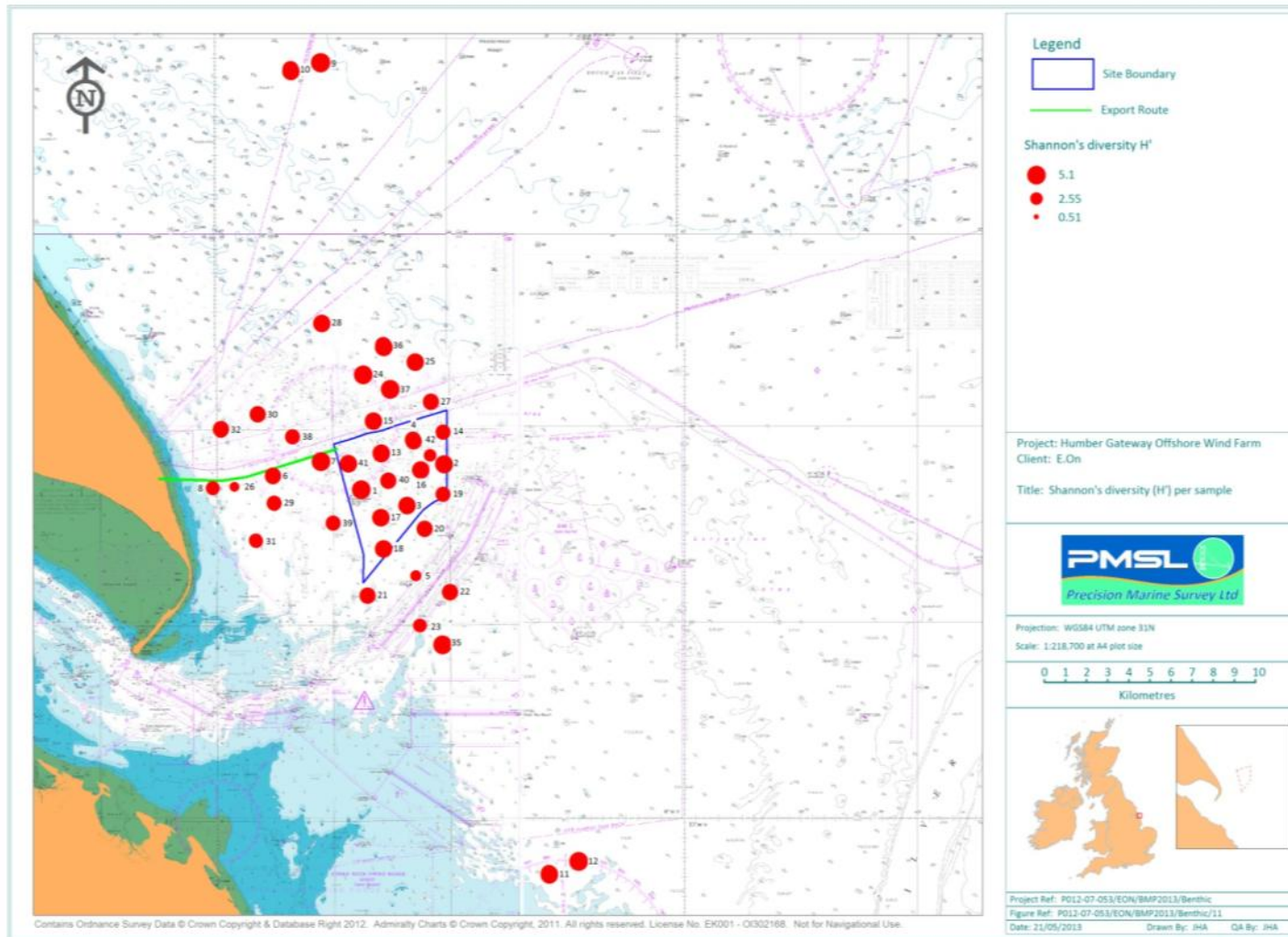


Figure 10. Shannon's diversity (H') per sample (0.1m<sup>2</sup>)

### 3.3 Dominant Taxa

In total 288 taxa were recorded during the survey and the dominant taxa by abundance and weight are shown in **Table 3**. In terms of abundance *Pisidia longicornis* was recorded in highest numbers and was found in 67% of the samples and accounted for 18% of the total abundance. Other species such as *Sabellaria spinulosa*, *Onoba semicostata*, *Amphipholis squamata*, *Mediomastus fragilis*, *Achelia echinata*, *Spio armata* agg., NEMATODA sp., *Galathea intermedia*, *Nucula nucleus* and *Leptochiton asellus* were also common and together accounted for 50% of the total abundance and were usually recorded in over 40% of the samples. A wide range of other taxa were recorded in lower numbers or with more restricted distribution. In terms of biomass *Pisidia longicornis* was also the most dominant accounting for 26% of total biomass and together with other taxa such as *Clausinella fasciata*, *Cancer pagurus*, *Galathea intermedia* and *Ocenebra erinaceus* (and *Ensis debris*) accounted for 50% of the total biomass. However a number of these taxa were recorded at relatively few sites. Other important taxa in terms of biomass which were relatively widespread were *Gibbula tumida*, *Nucula nucleus*, *Leptochiton asellus*, *Ophiopholis aculeata*, *Mya arenaria* and *Sabellaria spinulosa*.

**Table 3. Dominant taxa by abundance and biomass**

Taxa	Total A	Mean A	% of Samples	Cum %	Taxa	Total B	Mean B	% of Samples	Cum %
<i>Pisidia longicornis</i>	1407	36.99	67.11	17.99	<i>Pisidia longicornis</i>	48.2192	0.6345	67.11	26.11
<i>Sabellaria spinulosa</i>	524	13.79	63.16	24.69	<i>Clausinella fasciata</i>	20.3977	0.2684	7.89	37.16
<i>Onoba semicostata</i>	313	8.21	48.68	28.70	<i>Cancer pagurus</i>	13.9866	0.1840	1.32	44.73
<i>Amphipholis squamata</i>	310	8.16	78.95	32.66	<i>Ensis</i> sp. damaged	4.9993	0.0658	1.32	47.44
<i>Mediomastus fragilis</i>	240	6.32	52.63	35.73	<i>Galathea intermedia</i>	4.6275	0.0609	63.16	49.94
<i>Achelia echinata</i>	235	6.16	59.21	38.73	<i>Ocenebra erinaceus</i>	4.4522	0.0586	14.47	52.35
<i>Spio armata</i> agg.	213	5.61	68.42	41.46	<i>Gibbula tumida</i>	4.4092	0.0580	59.21	54.74
NEMATODA sp.	198	5.03	56.58	43.99	<i>Nucula nucleus</i>	4.1962	0.0552	39.47	57.01
<i>Galathea intermedia</i>	170	4.47	63.16	46.16	<i>Tapes rhomboides</i>	4.1767	0.0550	3.95	59.27
<i>Nucula nucleus</i>	164	4.32	39.47	48.26	<i>Leptochiton asellus</i>	4.0696	0.0535	57.89	61.48
<i>Leptochiton asellus</i>	145	3.82	57.89	50.12	<i>Timoclea ovata</i>	3.3194	0.0437	15.79	63.28
<i>Harmothoe impar</i>	134	3.53	55.26	51.83	<i>Gari tellinella</i>	3.1382	0.0413	7.89	64.98
<i>Gibbula tumida</i>	133	3.46	59.21	53.53	<i>Gibbula cineraria</i>	2.9977	0.0394	15.79	66.60
NEMERTEA sp.	131	3.45	64.47	55.20	<i>Ophiopholis aculeata</i>	2.9365	0.0386	26.32	68.19
<i>Lepidonotus squamatus</i>	124	3.24	63.16	56.79	<i>Mya arenaria</i>	2.8550	0.0376	18.42	69.73
<i>Hiatella arctica</i>	120	3.14	47.37	58.32	<i>Spisula elliptica</i>	2.7455	0.0361	9.21	71.22
<i>Melinna elisabethae</i>	115	3.03	28.95	59.80	<i>Sabellaria spinulosa</i>	2.7343	0.0360	63.16	72.70
<i>Pholoe baltica</i>	110	2.84	53.95	61.20	<i>Nephtys caeca</i>	2.4285	0.0320	14.47	74.02
<i>Rissoa parva</i>	109	2.87	28.95	62.60	<i>Goniodoris</i> sp.	2.3417	0.0308	6.58	75.29
<i>Glycera lapidum</i> agg.	92	2.39	64.47	63.77	<i>Ophiothrix fragilis</i>	2.0905	0.0275	22.37	76.42
<i>Syllis columbretensis</i>	91	2.38	44.74	64.94	<i>Thyone fusus</i>	2.0151	0.0265	2.63	77.51
<i>Orchomene humilis</i>	90	2.37	38.16	66.09	<i>Abra alba</i>	1.9696	0.0259	34.21	78.57
<i>Ophiopholis aculeata</i>	84	2.05	26.32	67.16	<i>Modiolus</i> juv.	1.9307	0.0254	19.74	79.62
<i>Polycirrus</i> sp.	79	2.07	52.63	68.17	<i>Ebalia tuberosa</i>	1.7433	0.0229	17.11	80.56
<i>Abra alba</i>	78	2.05	34.21	69.17	<i>Anomia ehippium</i>	1.5494	0.0204	2.63	81.40
<i>Thorax cranchii</i>	73	1.92	39.47	70.10	<i>Hiatella arctica</i>	1.4889	0.0196	47.37	82.21
<i>Chone</i> sp.	71	1.87	14.47	71.01	<i>Glycera lapidum</i> agg.	1.4403	0.0190	64.47	82.99
<i>Syllis armillaris</i>	69	1.64	31.58	71.89	<i>Crossaster papposus</i> juv.	1.3849	0.0182	3.95	83.74
<i>Musculus discors</i> juv.	63	1.66	27.63	72.70	<i>Ophelia borealis</i>	1.2595	0.0166	2.63	84.42
<i>Manzonia crassa</i>	61	1.59	27.63	73.48	<i>Asterias rubens</i>	1.1553	0.0152	1.32	85.05
<i>Callipallene brevirostris</i>	59	1.55	28.95	74.23	<i>Thelepus setosus</i>	1.1383	0.0150	6.58	85.66
<i>Scalibregma celticum</i>	57	1.50	34.21	74.96	<i>Thorax cranchii</i>	1.1187	0.0147	39.47	86.27
<i>Nuculana minuta</i>	55	1.45	30.26	75.66	<i>Hinia incressata</i>	1.0928	0.0144	15.79	86.86



In terms of qualitative or colonial epibenthic taxa over 50 species were recorded as highlighted in Table 4. The most widespread of these were species such as *Scrupocellaria scruposa*, *Crisia* sp., *Dendrodoa grossularia*, *Amathia lendigera*, *Alcyonidium diaphanum*, *Escharella immersa*, *Balanus crenatus*, *Schizomavella* sp. and *Verruca stroemi* which were recorded in over 50% of the samples. Overall a wide variety of hydroids, bryozoans were recorded along with a number of other encrusting species including barnacles, ascidians, tunicates and encrusting sponges.

**Table 4. Qualitative or colonial epibenthic taxa**

Taxa	% of Samples	Taxa	% of Samples
<i>Scrupocellaria scruposa</i>	82.89	<i>Molgula</i> sp.	13.16
<i>Crisia</i> sp.	77.63	Plumulariidae sp.	10.53
<i>Dendrodoa grossularia</i>	67.11	<i>Cellaria</i> sp.	9.21
<i>Amathia lendigera</i>	64.47	Porifera sp.	6.58
<i>Alcyonidium diaphanum</i>	61.84	<i>Halecium</i> sp.	6.58
<i>Escharella immersa</i>	57.89	<i>Parasmittina trispinosa</i>	6.58
<i>Balanus crenatus</i>	52.63	Corallinaceae sp.	6.58
<i>Schizomavella</i> sp.	52.63	<i>Tubularia</i> sp.	5.26
<i>Verruca stroemi</i>	50.00	Campanulariidae sp.	5.26
<i>Tubulipora</i> sp.	44.74	<i>Cirripedia</i> sp.	5.26
<i>Crisidia cornuta</i>	43.42	<i>Bugula flabellata</i>	5.26
<i>Sertularia</i> sp.	39.47	<i>Plocamium cartilagineum</i>	5.26
<i>Electra pilosa</i>	32.89	<i>Securiflustra securifrons</i>	3.95
<i>Flustra foliacea</i>	30.26	<i>Callopora rylandi</i>	3.95
<i>Amphiblestrum auritum</i>	30.26	<i>Nemertesia</i> sp.	2.63
<i>Phaeostachys spinifera</i>	30.26	<i>Nemertesia ramosa</i>	2.63
<i>Callopora</i> sp.	28.95	ACTINIARIA sp.	2.63
<i>Bicellariella ciliata</i>	26.32	<i>Salmacina dysteri</i>	2.63
<i>Escharella ventricosa</i>	25.00	<i>Conopeum reticulum</i>	2.63
<i>Escharoides coccinea</i>	21.05	<i>Leucosolenia</i> sp.	1.32
<i>Cellepora pumicosa</i>	21.05	<i>Sycon ciliatum</i>	1.32
<i>Microporella ciliata</i>	19.74	<i>Cliona</i> sp.	1.32
<i>Turbicellepora avicularis</i>	17.11	<i>Alcyonium digitatum</i>	1.32
<i>Vesicularia spinosa</i>	14.47	<i>Filograna implexa</i>	1.32
<i>Hydrallmania falcata</i>	13.16	<i>Balanus</i> sp. juv.	1.32
<i>Didemnidae</i> sp.	13.16	<i>Chorizopora brongniartii</i>	1.32

### 3.4 Multivariate Analysis

Multivariate analysis of the abundance data was carried out in order to describe the main patterns and assemblages within the area. Classification (cluster analysis) of the data was undertaken using the Bray-Curtis similarity coefficient and grouped average (UPGMA) clustering technique followed by a non metric MDS (multi dimensional scaling) ordination both using the PRIMER package. Cluster analysis is used to display graphically the similarity between sites based upon their species composition whereby the similarity between sites is calculated (in this case using the Bray-Curtis similarity coefficient) to produce a similarity matrix showing the percent similarity of sites (0% indicating no species in common and 100% indicating an identical community).

These values are then used to plot a dendrogram or tree diagram in which sites are linked at their respective similarity to other sites and consequently it is possible to define groups of sites with similar species composition at a predefined level of similarity. Non metric MDS graphically displays the (rank) similarity between sites as a 2 dimensional plot in which the distances between sites indicates the level of similarity between them. The stress value associated with an MDS plot indicates the how faithful the plot is in representing the similarity between sites with low values (below 0.2) generally indicating a good fit. The station groupings derived from cluster analysis have subsequently been superimposed onto the MDS plots and input into GIS and the dominant species and mean environmental and biological parameters for each group calculated. Site groupings were derived using the similarity profile test (SIMPROF) within the PRIMER package. Characteristic taxa within each group were assessed using the SIMPER routine in PRIMER.

Multivariate analysis was undertaken using both the full (replicate) dataset and also on a simplified dataset with replicate data averaged. The analysis was initially undertaken using the quantitative (enumerated) species data but has also been undertaken incorporating the qualitative species data whereby taxa recorded as present were given a nominal value of 1. All data was square root transformed prior to analysis.

The results of multivariate analysis on the full replicate (quantitative) dataset are provided in **Figure 11** with the spatial distribution of the SIMPROF groups shown in **Figure 12**. The results of cluster analysis highlight the high level of variability in the species data with similarities ranging from less than 10% to over 60%. Similar levels of variation were also found during the pre-construction surveys and are typical for coarse mixed sediments. The SIMPROF test delineated 16 groups of which a number consisted of small groups of samples or individual samples which are separated at varying levels of similarity. The characteristic taxa for the samples in each group as derived from the SIMPER test is provided in **Table 5**. The main division in sites is between groups a, b and c which consists of small groups of outlier samples generally with relatively low diversity (site 5 in group a, sample 6a and 26 in group b and site 42 in group c) which are separated at around 10% similarity. The remaining groups are of varying size ranging from small clusters of sites to larger groups such as group p. Similarities between these groups range from 20% to 50% and it is evident from **Table 5** that these samples are often characterised by similar groups of taxa but differ in terms of overall diversity and rank dominance of specific taxa. Whilst these communities are inherently variable they are often relatively closely related in terms of key species rather

than exhibiting gross changes in community structure and a similar pattern of interrelated coarse mixed sediment communities was evident in the characterisation survey. Key species which are often characteristic for many of the groups include *Sabellaria spinulosa*, *Chone* sp., *Glycera lapidum* agg, *Amphipholis squamata*, *Pisidia longicornis*, *Protodorvillea kefersteini*, *Spio armata* agg., *Mediomastus fragilis*, *Nucula nucleus*, *Melinna elisabethae*, *Onoba semicostata* and *Achelia echinata*. An assessment of the spatial distribution of the groups indicates those whilst there is a relatively high degree of variability (with variation between replicate samples often greater than variation between sites) there are some quite clear spatial groupings evident. This can be seen in the separation of the inshore/export route sites – primarily in groups d and e from sites to the north of the development site (groups l and m), the control sites (groups f, o and j) and sites in the development site (groups o, p and g). Other smaller groups tend to occur in relation to specific sites. Whilst the benthic data is relatively noisy and inherently variable with many of the coarse mixed sediment communities relatively closely related the spatial relationships between the sample groups should allow facilitate further interpretation and analysis following post construction monitoring.

Additional analysis of the benthic data has been undertaken namely assessment of replicate averaged datasets and analysis of data incorporating the qualitative species data. These tend to give broadly similar patterns albeit with subtle variations in group structure. The outputs from multivariate analysis using the replicate averaged data is provided in **Figures 11 and 12** and **Table 5** whilst outputs from the analysis incorporating qualitative data are provided in Appendices 6 and 7.

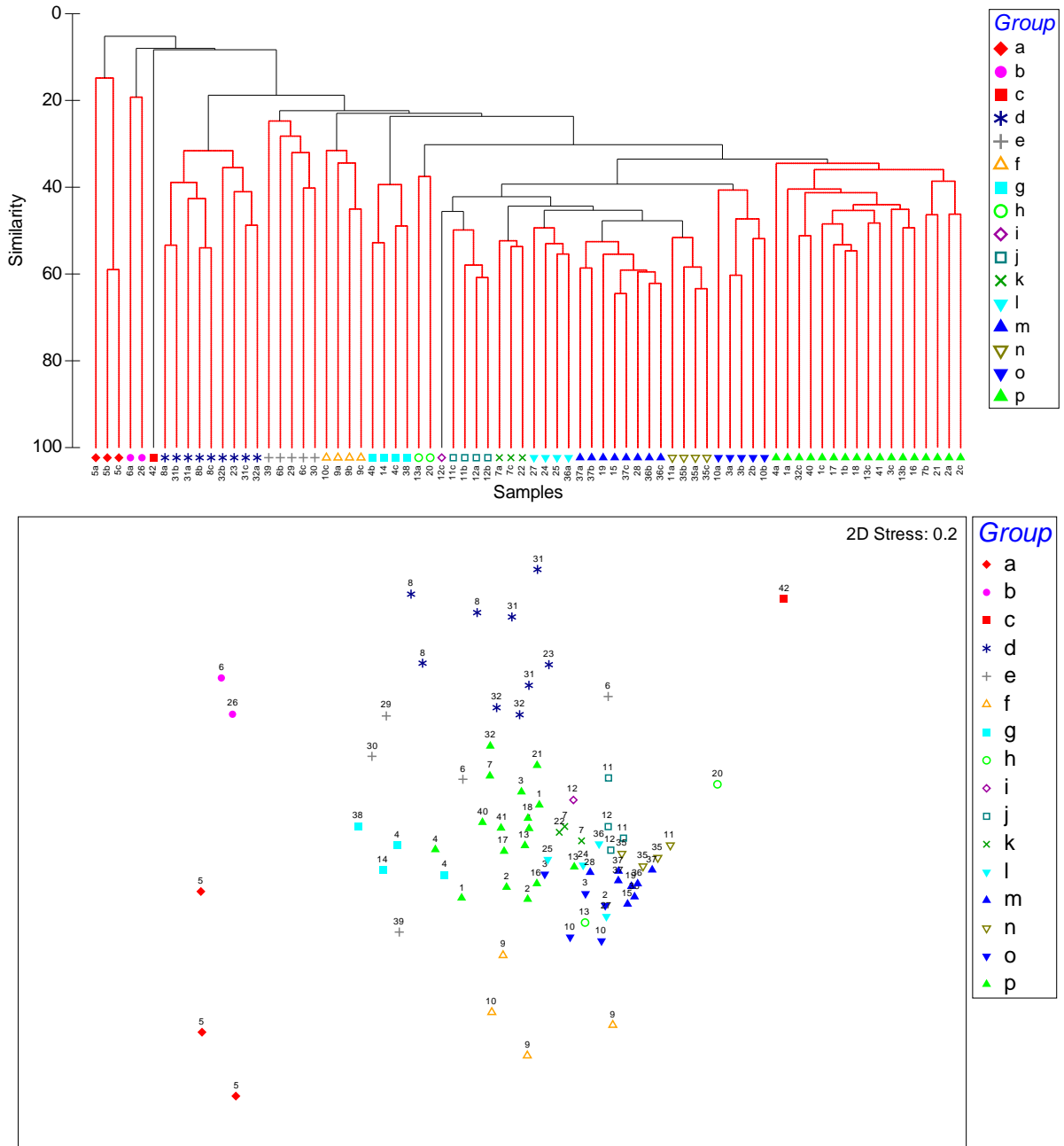


Figure 11. Results of cluster analysis and MDS using the quantitative replicate dataset.

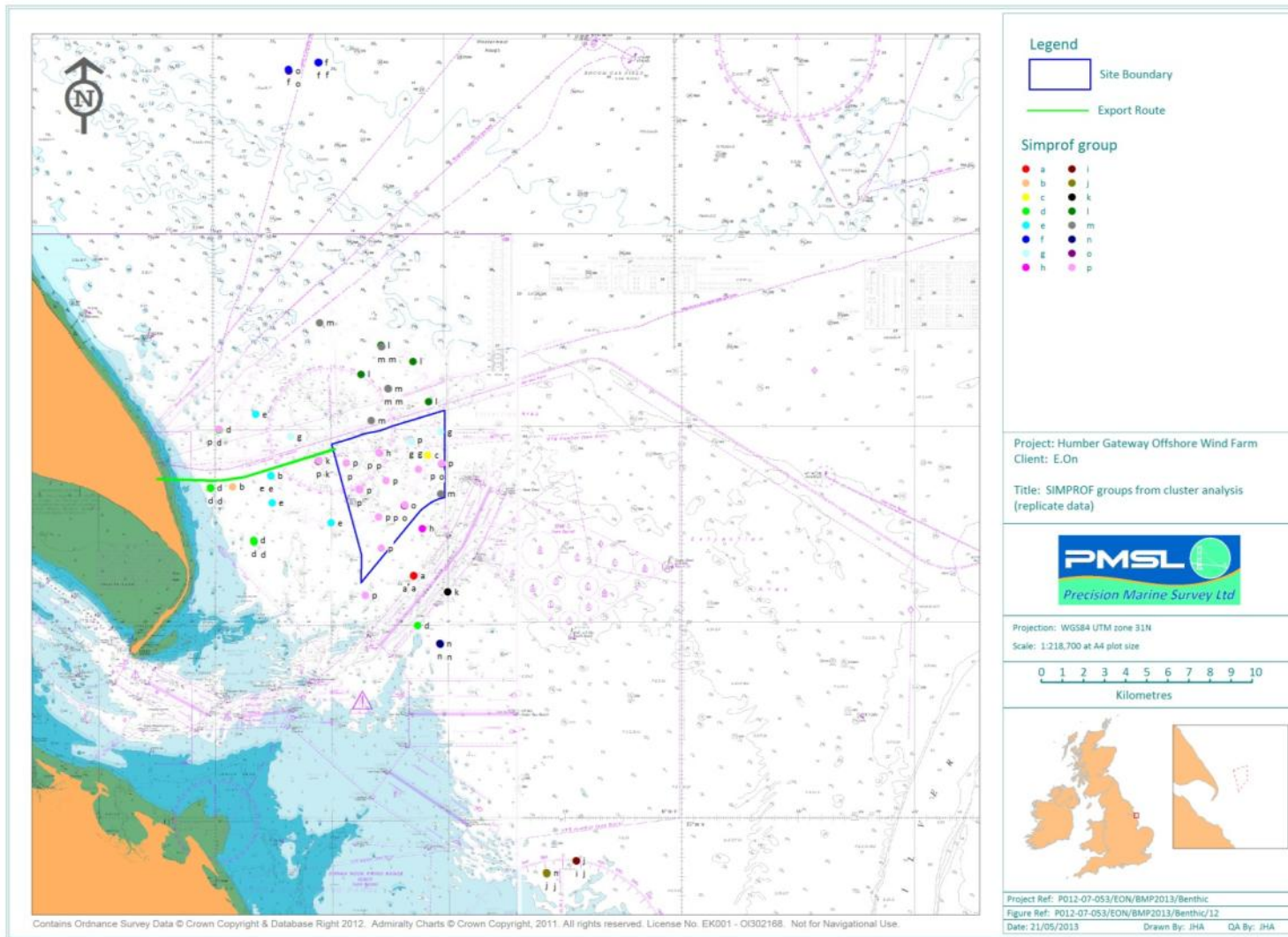


Figure 12. Spatial distribution of SIMPROF groups (quantitative replicate dataset)

**Table 5. Characteristic taxa from SIMPROF groups**

Samples		Group a			
5a		Average similarity: 29.50			
5b					
5c	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
	NEMATODA sp.	1.15	19.64	66.58	66.58
	Goodallia triangularis	1.14	9.86	33.42	100

Samples		Group b			
6a		Average similarity: 19.20			
26					
	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
	Glycera lapidum agg.	1.5	19.2	100	100

Sample		Group c			
42		Raw Abundance			
	Species				
	Rissoa parva	4			
	NEMERTEA sp.	1			
	Eusyllis blomstrandii	1			
	Hinia incrassata	1			
	Musculus discors juv.	1			
	Hiatella arctica	1			
	Ophiothrix fragilis	1			

Samples		Group d			
8a		Average similarity: 35.93			
8b					
8c	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
23	Sabellaria spinulosa	4.16	17.52	48.77	48.77
31a	Polycirrus sp.	0.95	3.49	9.73	58.5
31b	Spio armata agg.	0.76	2.59	7.21	65.71
31c	Unciola crenatipalma	0.94	2.02	5.63	71.34
32a	Amphipholis squamata	0.82	1.95	5.42	76.76
32b	Lepidonotus squamatus	0.65	1.54	4.28	81.04
	Orchomene humilis	0.71	1.03	2.87	83.91
	NEMATODA sp.	0.78	0.94	2.63	86.53
	Glycera lapidum agg.	0.44	0.93	2.59	89.13
	Eumida sanguinea	0.44	0.92	2.57	91.7

Samples		Group e			
6b		Average similarity: 28.75			
6c					
29	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
30	Glycera lapidum agg.	1.17	4.04	14.07	14.07
39	Spio armata agg.	0.88	3.27	11.36	25.43
	NEMERTEA sp.	0.8	3.26	11.35	36.78
	Galathea intermedia	1	3.26	11.35	48.13
	Thorulus cranchii	1.31	2.59	9.02	57.15
	Polycirrus sp.	0.83	1.95	6.77	63.91
	Harmothoe impar	0.68	1.83	6.37	70.28
	Pisidia longicornis	0.75	1.48	5.14	75.42
	Cheirocratus sp. female	0.75	1.43	4.97	80.39
	Spirobranchus lamarcki	0.6	1.43	4.96	85.35
	Pholoe baltica	0.4	0.67	2.34	87.69
	Gibbula tumida	0.57	0.65	2.26	89.95
	Eteone longa agg.	0.4	0.56	1.94	91.89



Samples		Group f			
9a		Average similarity: 34.71			
9b					
9c	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
10c	Chone sp.	3.16	4.85	13.99	13.99
	NEMERTEA sp.	2.16	2.7	7.78	21.76
	Spirobranchus triqueter	1.64	2.58	7.43	29.19
	Mediomastus fragilis	2.23	2.5	7.21	36.4
	Glycera lapidum agg.	1.18	1.77	5.1	41.49
	Leptochiton asellus	1.68	1.39	4	45.49
	Melinna elisabethae	2.11	1.2	3.47	48.96
	Achelia echinata	1.21	1.13	3.26	52.22
	Urothoe elegans	1.32	1.07	3.09	55.31
	Clymenura sp.	1.1	0.99	2.85	58.16
	Timoclea ovata	1.22	0.99	2.85	61.01
	Amphipholis squamata	0.85	0.89	2.57	63.58
	Caulleriella zetlandica	1.1	0.89	2.57	66.15
	Ampelisca spinipes	0.96	0.89	2.55	68.7
	Ampharetinae sp. juv.	1.6	0.85	2.46	71.16
	Lumbrineris cingulata	1.1	0.84	2.43	73.59
	Spiophanes kroyeri	1.04	0.84	2.43	76.03
	Euchone rubrocincta	1	0.8	2.3	78.33
	Ampelisca diadema	1.83	0.61	1.76	80.09
	Eteone longa agg.	0.5	0.42	1.2	81.29
	Caulleriella alata	0.6	0.42	1.2	82.5
	Aonides paucibranchiata	0.6	0.35	1	83.5
	Pisidia longicornis	0.68	0.35	1	84.5
	Galathowenia oculata	0.91	0.33	0.94	85.44
	Nucula nucleus	0.71	0.33	0.94	86.38
	Parvicardium ovale	0.85	0.33	0.94	87.32
	Harmothoe impar	0.5	0.32	0.92	88.24
	Nototropis swammerdamei	0.68	0.32	0.92	89.17
	Pholoe baltica	0.97	0.29	0.85	90.01

Samples		Group g			
4b		Average similarity: 43.17			
4c					
14	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
38	Amphipholis squamata	2.02	6.62	15.34	15.34
	NEMATODA sp.	2.18	6.55	15.18	30.53
	Chone sp.	2.25	5.06	11.73	42.25
	Glycera lapidum agg.	1.6	4.75	11	53.26
	NEMERTEA sp.	1.71	4.58	10.62	63.87
	Spio armata agg.	1.39	2.14	4.95	68.82
	Gibbula tumida	0.93	1.9	4.41	73.24
	Polycirrus sp.	0.75	1.84	4.27	77.51
	Laonice bahusiensis	0.75	1.73	4.01	81.52
	Goodallia triangularis	0.93	1.73	4.01	85.53
	Aonides paucibranchiata	1.12	1.19	2.76	88.29
	Sabellaria spinulosa	0.5	0.75	1.74	90.03

Samples		Group h			
13a		Average similarity: 37.48			
20					
	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
	Pisidia longicornis	2.94	6.92	18.47	18.47
	Rissoa parva	2.22	6.92	18.47	36.94
	Achelia echinata	1.93	4.9	13.06	50
	Onoba semicostata	1.93	4.9	13.06	63.06
	Harmothoe impar	1.37	3.46	9.23	72.3
	Lepidonotus squamatus	1	3.46	9.23	81.53
	Galathea intermedia	1.21	3.46	9.23	90.77

Samples		Group i
12c		Raw Abundance
	Sabellaria spinulosa	36
	Pisidia longicornis	8
	Onoba semicostata	8
	Amphipholis squamata	7
	Gibbula tumida	6
	Spio armata agg.	4
	Spirobranchus lamarcki	4
	Achelia echinata	4

Samples		Group j			
11b		Average similarity: 54.33			
11c					
12a					
12b					
	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
	Sabellaria spinulosa	5.78	6.58	12.11	12.11
	Pisidia longicornis	5.39	4.88	8.98	21.09
	Melinna elisabethae	2.78	3.08	5.66	26.76
	Nucula nucleus	1.99	2.39	4.4	31.16
	Protodorvillea kefersteini	2.13	2.17	3.99	35.15
	Cirriiformia tentaculata	1.72	1.99	3.67	38.82
	Spirobranchus lamarcki	2.13	1.99	3.67	42.49
	Gibbula tumida	1.88	1.96	3.61	46.1
	Rissoa parva	2.87	1.9	3.5	49.6
	NEMERTEA sp.	1.74	1.8	3.31	52.91
	Abra alba	2.06	1.76	3.24	56.15
	Amphipholis squamata	1.66	1.64	3.01	59.16
	Mediomastus fragilis	2.26	1.56	2.87	62.03
	Spio armata agg.	1.39	1.52	2.8	64.84
	Achelia echinata	1.43	1.42	2.61	67.44
	Scalibregma inflatum	1.29	1.36	2.51	69.95
	Eteone foliosa	1	1.28	2.35	72.3
	Cheirocratus sp. female	1.25	1.28	2.35	74.65
	Sphaerosyllis taylori	1.3	1.09	2.01	76.66
	Syllis columbretensis	1.41	0.96	1.77	78.43
	Eteone longa agg.	1.14	0.85	1.56	80
	NEMATODA sp.	1.04	0.78	1.43	81.43
	Thoralus cranchii	0.75	0.68	1.26	82.68
	Lepidonotus squamatus	0.96	0.68	1.25	83.94
	Harmothoe impar	1.26	0.68	1.25	85.19
	Laonice bahusiensis	1.04	0.68	1.25	86.44
	Glycera lapidum agg.	0.93	0.63	1.16	87.6
	Aonides paucibranchiata	1	0.6	1.11	88.71
	Nuculana minuta	0.93	0.6	1.11	89.81
	Onoba semicostata	1.36	0.47	0.86	90.68



Samples		Group k			
7a		Average similarity: 52.74			
7c					
22	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
	Onoba semicostata	4.96	7.55	14.31	14.31
	Spio armata agg.	2.83	4.14	7.85	22.17
	Sabellaria spinulosa	2.29	3.58	6.79	28.96
	Pisidia longicornis	2.33	3.46	6.57	35.52
	NEMERTEA sp.	2.14	3.25	6.16	41.68
	Nucula nucleus	2.23	3.05	5.79	47.47
	Manzonia crassa	2.34	2.74	5.19	52.66
	Syllis columbretensis	1.93	2.63	5	57.66
	Amphipholis squamata	2.15	2.61	4.94	62.6
	Mediomastus fragilis	1.38	2	3.8	66.4
	Pholoe baltica	1.47	1.97	3.74	70.14
	Glycera lapidum agg.	1.28	1.97	3.74	73.88
	Harmothoe impar	1.28	1.94	3.67	77.55
	Leptochiton asellus	1.33	1.73	3.28	80.84
	Phoronis sp.	1.41	1.73	3.28	84.12
	Gibbula tumida	1.05	0.93	1.76	85.88
	Polycirrus sp.	0.94	0.7	1.32	87.2
	Gibbula cineraria	1.29	0.7	1.32	88.52
	Hiatella arctica	1.14	0.7	1.32	89.84
	Orchomene humilis	0.91	0.66	1.24	91.08

Samples		Group l			
24		Average similarity: 51.54			
25					
27	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
36a	Pisidia longicornis	4.95	6.53	12.66	12.66
	Amphipholis squamata	2.27	3.73	7.24	19.9
	Abra alba	2.2	3.15	6.1	26.01
	Onoba semicostata	2.1	3.11	6.03	32.04
	Mediomastus fragilis	1.72	2.91	5.65	37.68
	Galathea intermedia	2.49	2.9	5.63	43.31
	Pholoe baltica	1.57	2.71	5.26	48.58
	Achelia echinata	1.47	2.37	4.6	53.17
	Lepidonotus squamatus	1.6	2.3	4.47	57.65
	Caulleriella alata	1	1.85	3.6	61.24
	Gnathia dentata	1.1	1.85	3.6	64.84
	Thoralus cranchii	1.54	1.85	3.6	68.44
	Nucula nucleus	1.29	1.31	2.55	70.99
	Spio armata agg.	1.31	1.15	2.23	73.21
	Gibbula tumida	1.18	1.15	2.22	75.44
	NEMERTEA sp.	1.1	1.14	2.21	77.65
	Aonides oxycephala	1.12	1.12	2.18	79.82
	Hiatella arctica	1.3	1.1	2.13	81.96
	Glycera lapidum agg.	1.04	1.06	2.06	84.02
	Leptochiton asellus	1.04	0.98	1.9	85.92
	Syllis columbretensis	0.85	0.9	1.75	87.67
	Hemilepton nitidum	1	0.9	1.75	89.42
	Nuculana minuta	0.75	0.87	1.68	91.11

Samples	Group m				
15	Average similarity: 55.91				
19					
28	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
36b	Pisidia longicornis	8.19	6.73	12.04	12.04
36c	Achelia echinata	3.79	3.37	6.03	18.06
37a	Amphipholis squamata	3.27	3.15	5.63	23.69
37b	Onoba semicostata	2.95	2.53	4.53	28.23
37c	Mediomastus fragilis	3.13	2.15	3.85	32.08
	Leptochiton asellus	2.33	2.14	3.82	35.9
	Harmothoe impar	2.41	2.06	3.69	39.59
	Hiatella arctica	2.33	1.64	2.93	42.52
	Sabellaria spinulosa	2	1.58	2.82	45.34
	Callipallene brevirostris	2	1.58	2.82	48.17
	Nucula nucleus	1.8	1.54	2.76	50.93
	Gibbula tumida	1.83	1.49	2.67	53.6
	Harmothoe sp.	1.91	1.44	2.57	56.17
	Galathea intermedia	1.64	1.42	2.53	58.71
	Lepidonotus squamatus	1.8	1.3	2.33	61.04
	Musculus discors juv.	1.73	1.3	2.33	63.36
	Melinna elisabethae	1.58	1.23	2.21	65.57
	Cauleriella alata	1.52	1.01	1.81	67.38
	Nuculana minuta	1.42	0.97	1.74	69.11
	Abra alba	1.3	0.93	1.66	70.77
	Hemilepton nitidum	1.12	0.87	1.56	72.33
	Hinia incrassata	1.1	0.83	1.48	73.81
	Pholoe baltica	1.23	0.76	1.36	75.17
	Syllis columbretensis	1.24	0.71	1.27	76.44
	Scalibregma celticum	1.3	0.68	1.22	77.66
	Pholoe inornata	0.98	0.67	1.2	78.86
	Parvicardium ovale	1.02	0.64	1.14	80
	Eteone longa agg.	1	0.61	1.09	81.09
	Manzonina crassa	0.98	0.61	1.08	82.18
	Protodorvillea kefersteini	0.75	0.57	1.01	83.19
	Cheirocratus sp. female	0.98	0.55	0.99	84.18
	Spio armata agg.	1.18	0.5	0.9	85.07
	Rissoa parva	1.05	0.47	0.83	85.9
	Thoralus cranchii	0.89	0.4	0.71	86.62
	Eumida sanguinea	0.93	0.39	0.69	87.31
	Mya sp. juv.	0.73	0.38	0.69	88
	Ebalia tuberosa	0.73	0.38	0.68	88.68
	Harmothoe extenuata	0.73	0.35	0.62	89.31
	Mya arenaria	0.68	0.34	0.61	89.91
	Scalibregma inflatum	0.73	0.34	0.6	90.51

Samples		Group n			
11a		Average similarity: 55.78			
35a					
35b	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
35c	Nucula nucleus	4.52	5.23	9.38	9.38
	Pisidia longicornis	4.68	5.17	9.26	18.65
	Onoba semicostata	3.93	3.89	6.97	25.61
	Amphipholis squamata	2.9	2.94	5.27	30.88
	Harmothoe impar	2.41	2.68	4.81	35.7
	Mediomastus fragilis	2.64	2.56	4.59	40.29
	Sabellaria spinulosa	2.81	2.24	4.01	44.31
	Syllis armillaris	2.07	2.19	3.92	48.23
	Rissoa parva	1.85	2.06	3.69	51.92
	Manzonina crassa	1.88	2	3.59	55.51
	Caulleriella alata	1.57	1.85	3.32	58.82
	Nuculana minuta	1.97	1.79	3.21	62.03
	Thorulus cranchii	1.55	1.72	3.08	65.11
	Lepidonotus squamatus	1.85	1.63	2.93	68.03
	Galathea intermedia	1.64	1.42	2.54	70.58
	Spio armata agg.	1.86	1.33	2.38	72.96
	Melinna elisabethae	1.87	1.3	2.32	75.28
	Orchomenella nana	1	1.27	2.27	77.55
	Gibbula tumida	1	1.27	2.27	79.82
	Achelia echinata	1.43	1.1	1.97	81.79
	Syllis columbretensis	1.57	1.03	1.84	83.63
	Scalibregma celticum	1.14	0.85	1.53	85.16
	Abra alba	1.18	0.8	1.44	86.6
	Cheirocratus intermedius	1.18	0.77	1.39	87.99
	Cheirocratus sp. female	0.96	0.7	1.26	89.25
	Harpinia antennaria	0.85	0.66	1.19	90.44

Samples		Group o			
2b		Average similarity: 46.35			
3a					
3b	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
10a	Pisidia longicornis	7.65	10.21	22.02	22.02
10b	Galathea intermedia	2.63	3.49	7.54	29.56
	Amphipholis squamata	2.68	3.3	7.12	36.68
	Gibbula tumida	2.1	2.65	5.71	42.39
	Leptochiton asellus	1.75	2.38	5.13	47.51
	NEMATODA sp.	1.31	1.78	3.84	51.35
	Harmothoe fragilis	1.25	1.78	3.84	55.19
	Harmothoe impar	1.45	1.65	3.56	58.75
	Spirobranchus triqueter	1.52	1.31	2.84	61.59
	Lepidonotus squamatus	1.19	1.31	2.82	64.41
	Spio armata agg.	1.53	1.27	2.73	67.14
	Onoba semicostata	1.67	1.23	2.65	69.79
	Hinia incrassata	1.63	1.19	2.56	72.35
	Timoclea ovata	0.88	0.95	2.04	74.39
	Caulleriella alata	0.8	0.92	1.99	76.38
	Orchomene humilis	1.59	0.79	1.7	78.08
	Achelia echinata	1.19	0.77	1.67	79.75
	Modiolus juv.	0.85	0.65	1.4	81.16
	Mediomastus fragilis	1.22	0.64	1.39	82.55
	Polynoidae sp.	0.97	0.64	1.37	83.92
	Pholoe baltica	0.91	0.64	1.37	85.29
	Cheirocratus sp. female	0.91	0.62	1.34	86.63
	Glycera lapidum agg.	0.77	0.62	1.33	87.96
	Abra alba	0.77	0.53	1.15	89.11
	NEMERTEA sp.	0.6	0.53	1.14	90.25

Samples	Group p				
1a	Average similarity: 39.75				
1b					
1c	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
2a	Spio armata agg.	1.94	3.3	8.3	8.3
2c	NEMATODA sp.	2.3	3.28	8.24	16.55
3c	Amphipholis squamata	1.52	2.42	6.1	22.64
4a	Pisidia longicornis	1.9	2.08	5.22	27.86
7b	Leptochiton asellus	1.3	1.94	4.89	32.75
13b	NEMERTEA sp.	1.15	1.85	4.66	37.41
13c	Pholoe baltica	1.36	1.82	4.58	41.99
16	Glycera lapidum agg.	1.09	1.73	4.35	46.33
17	Syllis columbretensis	1.04	1.51	3.8	50.14
18	Gibbula tumida	1.07	1.51	3.79	53.93
21	Galathea intermedia	1.23	1.47	3.7	57.63
32c	Achelia echinata	1.21	1.39	3.49	61.13
40	Lepidonotus squamatus	1.04	1.31	3.28	64.41
41	Hiatella arctica	0.84	1.27	3.2	67.61
	Sabellaria spinulosa	1.22	1.19	2.99	70.61
	Polycirrus sp.	1.04	1.15	2.89	73.49
	Ophiopholis aculeata	1.34	1.1	2.77	76.26
	Scalibregma celticum	0.66	0.8	2.01	78.27
	Syllis armillaris	0.84	0.75	1.88	80.15
	Harmothoe impar	0.72	0.67	1.69	81.83
	Mediomastus fragilis	0.73	0.61	1.54	83.37
	Golfingia vulgaris vulgaris	0.64	0.6	1.51	84.88
	Ophiothrix fragilis	0.67	0.43	1.08	85.96
	Protodorvillea kefersteini	0.62	0.41	1.04	87
	Onoba semicostata	0.67	0.41	1.02	88.02
	Polynoidae sp.	0.57	0.39	0.97	88.99
	Orchomene humilis	0.54	0.36	0.9	89.89
	Modiolus juv.	0.41	0.35	0.88	90.77

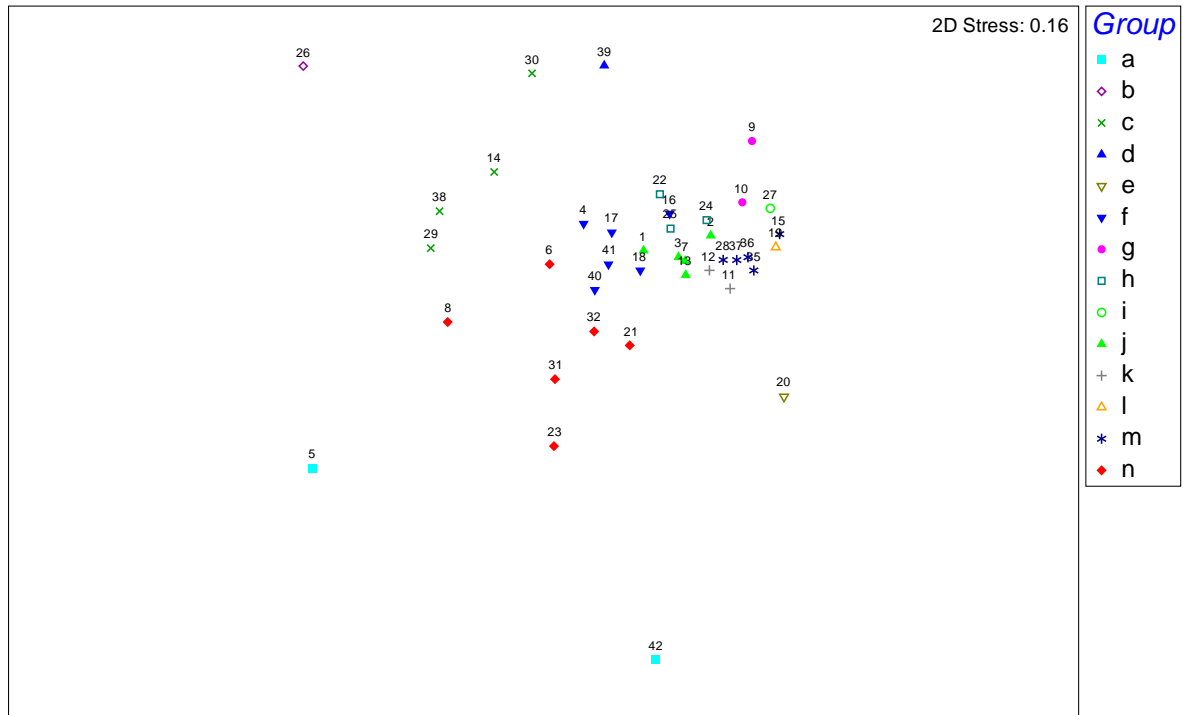
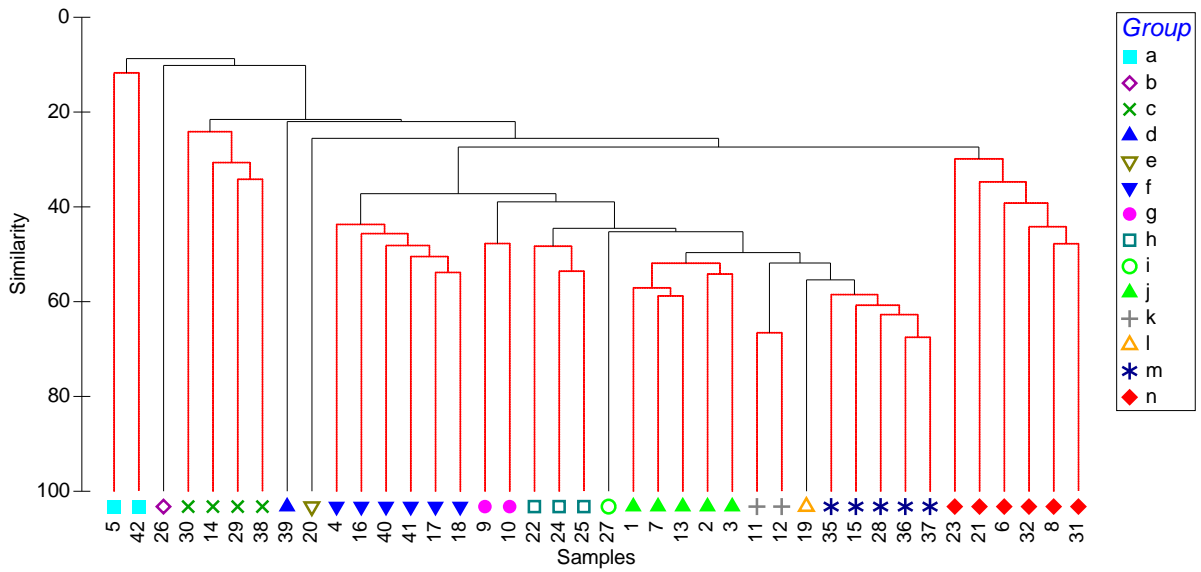


Figure 13. Results of cluster analysis and MDS using the quantitative replicate averaged dataset

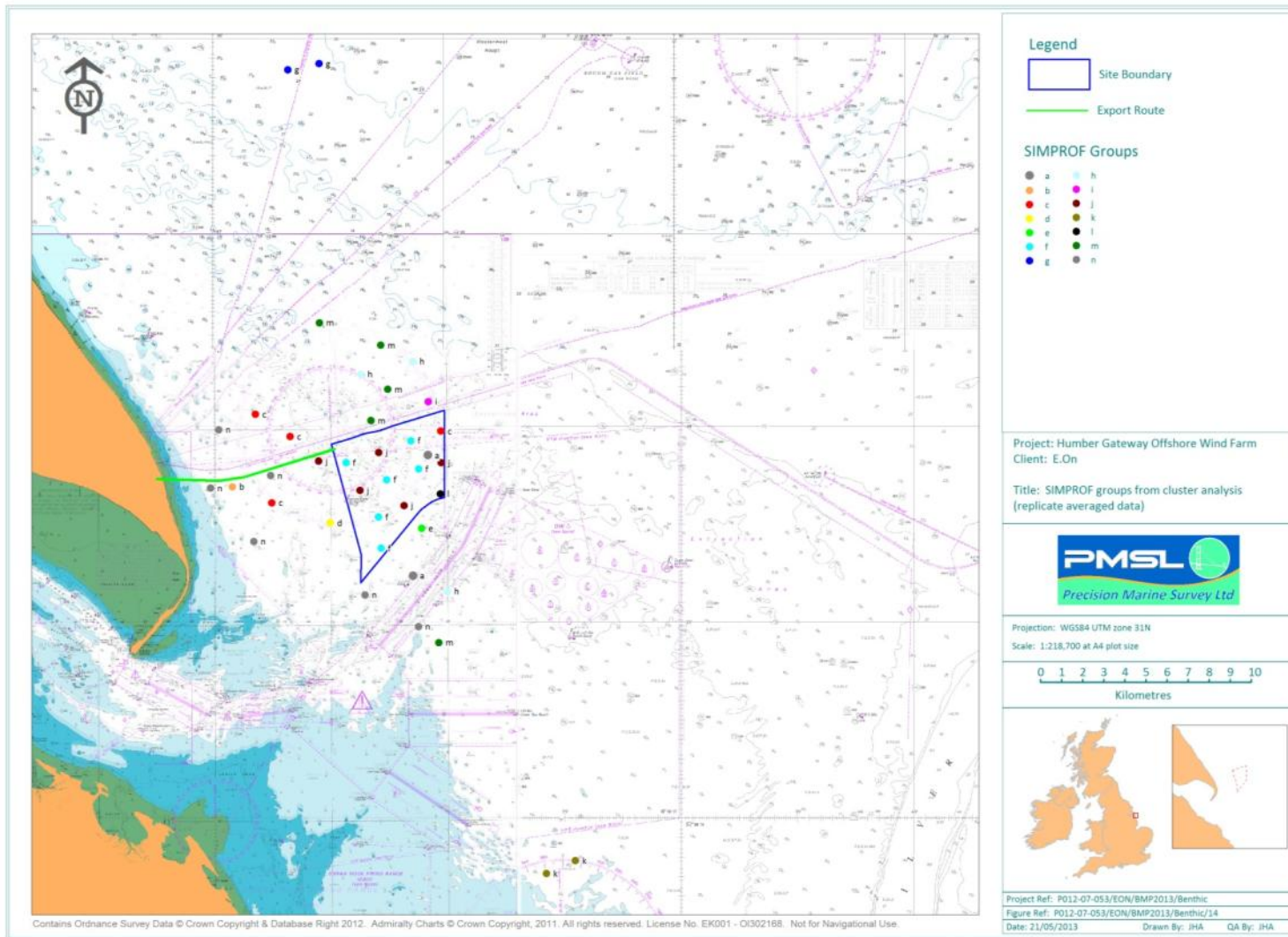


Figure 14. Spatial distribution of SIMPROF groups (quantitative replicate averaged dataset)

**Table 6. Characteristic taxa from SIMPROF groups (quantitative replicate averaged data)**

Sample	Textural group	Group a				
5	Sandy Gravel	Average similarity: 11.70				
42	Gravel					
		Species	Av.Abund	Av.Sim	Contrib%	Cum.%
		NEMERTEA sp.	0.91	11.7	100	100

Sample	Textural group	Group b	
26	Sandy Gravel	Raw Abundance	
		Species	Raw Abundance
		Glycera lapidum agg.	4
		Polycirrus sp.	1
		Gammarellus homari	1
		Leptochiton asellus	1

Sample	Textural group	Group c				
14	Sandy Gravel	Average similarity: 27.96				
29	Muddy Sandy Gravel					
30	Sandy Gravel					
38	Gravel					
		Species	Av.Abund	Av.Sim	Contrib%	Cum.%
		Glycera lapidum agg.	1.39	6.45	23.08	23.08
		Polycirrus sp.	1.29	5.83	20.86	43.94
		Pholoe baltica	0.75	2.72	9.74	53.68
		Spio armata agg.	0.75	2.72	9.74	63.42
		NEMERTEA sp.	0.85	2.62	9.37	72.79
		Sphaerosyllis taylori	0.6	1.05	3.76	76.55
		Sabellaria spinulosa	0.5	1.05	3.76	80.31
		Amphipholis squamata	0.97	1.01	3.6	83.9
		Spisula elliptica	0.6	0.88	3.16	87.06
		Mediomastus fragilis	0.6	0.74	2.66	89.72
		Pisidia longicornis	0.5	0.74	2.66	92.37

Sample	Textural group	Group d	
39	Sandy Gravel	Raw Abundance	
		Species	Raw Abundance
		Syllis armillaris	9
		Pisidia longicornis	3
		Glycera lapidum agg.	2
		Syllis columbretensis	2
		Gibbula tumida	2
		NEMERTEA sp.	1
		Harmothoe impar	1
		Eteone longa agg.	1
		Eulalia exusilla	1
		Eumida sanguinea	1
		Spirobranchus lamarcki	1
		Galathea intermedia	1

Sample	Textural group	Species	Group e Raw Abundance
20	Gravel	Pisidia longicornis	4
		Rissoa parva	4
		Harmothoe impar	3
		Callipallene brevirostris	3
		Achelia echinata	2
		Galathea intermedia	2
		Onoba semicostata	2
		Musculus discors juv.	2
		Lepidonotus squamatus	1
		Eumida sanguinea	1
		Orchomene humilis	1
		Othomaera othonis	1

Sample	Textural group	Species	Group f Average similarity: 46.67			
			Av.Abund	Av.Sim	Contrib%	Cum.%
4	Muddy Sandy Gravel					
16	Muddy Sandy Gravel					
17	Gravel					
18	Sandy Gravel	NEMATODA sp.	2.53	5.67	12.15	12.15
40	Muddy Sandy Gravel	Spio armata agg.	2.02	4.62	9.89	22.04
41	Gravel	Leptochiton asellus	1.66	3.44	7.36	29.4
		Amphipholis squamata	1.65	3.15	6.75	36.15
		Galathea intermedia	1.69	2.85	6.11	42.27
		Pisidia longicornis	1.82	2.6	5.57	47.84
		Gibbula tumida	1.38	2.55	5.46	53.29
		Glycera lapidum agg.	1.18	1.86	3.99	57.29
		Hiatella arctica	0.9	1.79	3.84	61.13
		Ophiopholis aculeata	1.84	1.73	3.7	64.82
		Lepidonotus squamatus	1.07	1.69	3.61	68.44
		Aonides paucibranchiata	0.95	1.61	3.46	71.89
		Achelia echinata	1.25	1.6	3.43	75.33
		Polycirrus sp.	1.12	1.5	3.22	78.55
		Golfingia vulgaris vulgaris	0.83	1.27	2.73	81.27
		NEMERTEA sp.	1.11	1.24	2.65	83.93
		Harmothoe impar	0.96	1.21	2.58	86.51
		Pholoe baltica	0.97	0.82	1.76	88.28
		Scalibregma celticum	0.67	0.72	1.54	89.82
		Syllis armillaris	0.5	0.5	1.07	90.89



Sample	Textural group	Group g				
9	Muddy Sandy Gravel	Average similarity: 47.72				
10	Sandy Gravel					
		Species	Av.Abund	Av.Sim	Contrib%	Cum.%
		Chone sp.	2.65	2.77	5.79	5.79
		Mediomastus fragilis	2.38	2.26	4.73	10.53
		Leptochiton asellus	1.99	2.26	4.73	15.26
		Spirobranchus triqueter	1.93	2.02	4.23	19.49
		Melinna elisabethae	2.18	1.89	3.96	23.45
		Hydroides norvegica	1.34	1.43	2.99	26.44
		Achelia echinata	1.34	1.43	2.99	29.43
		Timoclea ovata	1.39	1.43	2.99	32.42
		NEMERTEA sp.	1.79	1.24	2.59	35.02
		Galathea intermedia	1.46	1.24	2.59	37.61
		Amphipholis squamata	1.37	1.24	2.59	40.2
		Harmothoe impar	0.82	1.01	2.12	42.31
		Lepidonotus squamatus	0.82	1.01	2.12	44.43
		Pholoe baltica	1.22	1.01	2.12	46.55
		Glycera lapidum agg.	1.05	1.01	2.12	48.66
		Galatowenia oculata	1.17	1.01	2.12	50.78
		Ampelisca spinipes	0.99	1.01	2.12	52.89
		Cheirocratus sp. female	0.99	1.01	2.12	55.01
		Ebalia tuberosa	0.82	1.01	2.12	57.13
		Onchidorididae sp.	0.99	1.01	2.12	59.24
		Nucula nucleus	0.99	1.01	2.12	61.36
		Nuculana minuta	0.82	1.01	2.12	63.47
		Abra alba	0.91	1.01	2.12	65.59
		Harmothoe fragilis	0.79	0.71	1.5	67.08
		Eteone longa agg.	0.58	0.71	1.5	68.58
		Sphaerosyllis taylori	0.58	0.71	1.5	70.08
		Nephtys caeca	0.7	0.71	1.5	71.57
		Lumbrineris cingulata	1.05	0.71	1.5	73.07
		Scoloplos armiger	0.58	0.71	1.5	74.57
		Aonides paucibranchiata	0.79	0.71	1.5	76.06
		Laonice sp. juv.	0.58	0.71	1.5	77.56
		Prionospio sp.	0.58	0.71	1.5	79.05
		Spio armata agg.	0.58	0.71	1.5	80.55
		Caulleriella alata	0.79	0.71	1.5	82.05
		Caulleriella zetlandica	1.05	0.71	1.5	83.54
		Clymenura sp.	1	0.71	1.5	85.04
		Scalibregma inflatum	0.58	0.71	1.5	86.53
		Polycirrus sp.	0.7	0.71	1.5	88.03
		Euchone rubrocincta	0.93	0.71	1.5	89.53
		Jasmineira caudata	0.58	0.71	1.5	91.02

Sample	Textural group	Group h				
22	Sandy Gravel	Average similarity: 50.04				
24	Sandy Gravel					
25	Gravel	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
		Pisidia longicornis	2.76	5.07	10.13	10.13
		Onoba semicostata	2.78	4.28	8.55	18.68
		Spio armata agg.	2.62	4.21	8.42	27.09
		Mediomastus fragilis	1.63	3.42	6.83	33.93
		Amphipholis squamata	1.87	3.39	6.78	40.71
		Pholoe baltica	1.52	3.17	6.33	47.04
		NEMERTEA sp.	1.58	2.82	5.64	52.67
		Gibbula tumida	1.49	2.78	5.56	58.23
		Glycera lapidum agg.	1.38	2.57	5.13	63.36
		Achelia echinata	1.38	2.53	5.06	68.42
		Phoronis sp.	1.38	2.53	5.06	73.49
		Harmothoe impar	1.14	2.24	4.48	77.96
		Aonides oxycephala	1.24	1.37	2.74	80.71
		Nucula nucleus	1.29	1.04	2.09	82.79
		Galathea intermedia	0.94	1	2	84.8
		Abra alba	1.05	1	2	86.8
		Syllis columbretensis	0.91	0.79	1.58	88.38
		Orchomene humilis	0.91	0.79	1.58	89.97
		Leptochiton asellus	0.67	0.74	1.48	91.44

Sample	Textural group	Group i	
27	Muddy Sandy Gravel	Species	Raw Abundance
		Pisidia longicornis	55
		Galathea intermedia	22
		Thoralus cranchii	10
		Abra alba	7
		Amphipholis squamata	7
		Scalibregma celticum	6
		Hiatella arctica	6
		Lepidonotus squamatus	5
		Mediomastus fragilis	4
		Gibbula tumida	4
		Harmothoe abyssicola	3
		Pholoe baltica	3

Sample	Textural group	Group j				
1	Gravel	Average similarity: 53.83				
2	Gravel					
3	Gravel	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
7	Muddy Sandy Gravel	Pisidia longicornis	4.21	4.03	7.48	7.48
13	Sandy Gravel	Spio armata agg.	2.27	2.81	5.22	12.7
		Amphipholis squamata	2.22	2.75	5.11	17.82
		NEMATODA sp.	2.14	1.99	3.7	21.51
		Pholoe baltica	1.64	1.93	3.58	25.1
		Galathea intermedia	1.7	1.74	3.24	28.33
		Gibbula tumida	1.45	1.6	2.97	31.31
		Leptochiton asellus	1.35	1.6	2.97	34.28
		Glycera lapidum agg.	1.23	1.58	2.94	37.22
		Lepidonotus squamatus	1.34	1.56	2.91	40.13
		Harmothoe impar	1.24	1.56	2.89	43.02
		Onoba semicostata	1.97	1.51	2.8	45.82
		NEMERTEA sp.	1.3	1.48	2.76	48.58
		Hiatella arctica	1.14	1.47	2.73	51.31
		Polycirrus sp.	1.15	1.39	2.59	53.9
		Syllis columbretensis	1.37	1.37	2.55	56.45
		Sabellaria spinulosa	1.3	1.33	2.48	58.92
		Modiolus juv.	0.95	1.19	2.21	61.14
		Achelia echinata	1.5	1.18	2.19	63.33
		Polynoidae sp.	1.1	1.13	2.1	65.43
		Syllis armillaris	1.14	1.08	2.01	67.44
		Eteone longa agg.	0.83	0.95	1.77	69.22
		Manzonina crassa	1.07	0.95	1.76	70.98
		Orchomene humilis	1.18	0.93	1.73	72.71
		Mediomastus fragilis	1.1	0.91	1.68	74.39
		Gibbula cineraria	0.89	0.77	1.43	75.82
		Aonides oxycephala	0.89	0.72	1.34	77.16
		Ophiopholis aculeata	1.11	0.67	1.24	78.41
		Aonides paucibranchiata	0.74	0.64	1.19	79.6
		Ophiothrix fragilis	0.68	0.64	1.19	80.8
		Thoralus cranchii	0.83	0.59	1.1	81.89
		Scalibregma celticum	0.66	0.54	1	82.89
		Callipallene brevirostris	0.66	0.54	1	83.89
		Golfingia vulgaris vulgaris	0.6	0.49	0.91	84.8
		Cauleriella alata	0.55	0.48	0.89	85.7
		Cheirocratus sp. female	0.63	0.39	0.72	86.42
		Musculus discors juv.	0.78	0.28	0.52	86.95
		Mya arenaria	0.48	0.28	0.52	87.46
		Pholoe inornata	0.48	0.27	0.5	87.96
		Nucula nucleus	0.64	0.27	0.5	88.46
		Nuculana minuta	0.44	0.27	0.5	88.96
		Boreotrophon truncatus	0.35	0.26	0.48	89.44
		Othomaera othonis	0.43	0.26	0.48	89.92
		Protodorvillea kefersteini	0.39	0.25	0.47	90.39

Sample	Textural group	Group k				
11	Gravel	Average similarity: 66.55				
12	Sandy Gravel					
		Species	Av.Abund	Av.Sim	Contrib%	Cum.%
		Sabellaria spinulosa	5.75	5.89	8.85	8.85
		Pisidia longicornis	5.21	5.28	7.93	16.78
		Melinna elisabethae	2.48	2.55	3.83	20.61
		Mediomastus fragilis	2.38	2.14	3.22	23.82
		Onoba semicostata	2.15	2.05	3.08	26.9
		Gibbula tumida	1.91	1.85	2.78	29.69
		Spirobranchus lamarcki	2.07	1.75	2.63	32.31
		Achelia echinata	1.68	1.75	2.63	34.94
		Amphipholis squamata	1.9	1.75	2.63	37.56
		Nucula nucleus	2.32	1.63	2.46	40.02
		NEMERTEA sp.	1.62	1.51	2.27	42.29
		Protodorvillea kefersteini	1.79	1.51	2.27	44.56
		Cirriiformia tentaculata	1.47	1.51	2.27	46.84
		Rissoa parva	2.62	1.38	2.08	48.91
		NEMATODA sp.	1.22	1.24	1.86	50.77
		Eteone longa agg.	1.15	1.24	1.86	52.63
		Sphaerosyllis taylori	1.39	1.24	1.86	54.48
		Spio armata agg.	1.39	1.24	1.86	56.34
		Scalibregma inflatum	1.15	1.24	1.86	58.19
		Abra alba	1.84	1.24	1.86	60.05
		Harmothoe impar	1.5	1.07	1.61	61.66
		Laonice bahusiensis	1.08	1.07	1.61	63.27
		Scalibregma celticum	1.15	1.07	1.61	64.87
		Manzonina crassa	1.37	1.07	1.61	66.48
		Ophiothrix sp. juv.	1	1.07	1.61	68.09
		Harmothoe sp.	0.99	0.87	1.31	69.4
		Lepidonotus squamatus	1.17	0.87	1.31	70.71
		Eteone foliosa	0.82	0.87	1.31	72.03
		Syllis columbretensis	1.27	0.87	1.31	73.34
		Syllis armillaris	1.05	0.87	1.31	74.65
		Eunereis longissima	1.17	0.87	1.31	75.96
		Lumbrineris cingulata	0.99	0.87	1.31	77.28
		Notomastus sp.	1.12	0.87	1.31	78.59
		Polycirrus sp.	1.05	0.87	1.31	79.9
		Cheirocratus sp. female	1.05	0.87	1.31	81.21
		Galathea intermedia	0.91	0.87	1.31	82.53
		Nuculana minuta	0.99	0.87	1.31	83.84
		Phoronis sp.	0.91	0.87	1.31	85.15
		Pholoe inornata	1	0.62	0.93	86.08
		Glycera lapidum agg.	0.87	0.62	0.93	87.01
		Syllis garciai	0.7	0.62	0.93	87.93
		Eusyllis blomstrandii	0.58	0.62	0.93	88.86
		Aonides paucibranchiata	1	0.62	0.93	89.79
		Caulleriella alata	0.79	0.62	0.93	90.72

Sample	Textural group	Species	Group l Raw Abundance
19	Gravel	Pisidia longicornis	207
		Amphipholis squamata	13
		Gibbula cineraria	10
		Achelia echinata	9
		Harmothoe sp.	8
		Harmothoe impar	8
		Orchomene humilis	8
		Onoba semicostata	7
		Phoronis sp.	7
		Spio armata agg.	6
		Caulleriella alata	6
		Lepidonotus squamatus	5

Sample	Textural group	Species	Group m Average similarity: 60.92			
			Av.Abund	Av.Sim	Contrib%	Cum.%
15	Muddy Sandy Gravel					
28	Gravel					
35	Sandy Gravel	Pisidia longicornis	6.86	6.08	9.98	9.98
36	Sandy Gravel	Amphipholis squamata	3.14	2.82	4.63	14.61
37	Gravel	Achelia echinata	3.53	2.67	4.38	18.99
		Onoba semicostata	3.15	2.44	4.01	23
		Mediomastus fragilis	2.87	2.08	3.42	26.42
		Harmothoe impar	2.41	2	3.29	29.7
		Nucula nucleus	2.39	1.73	2.85	32.55
		Lepidonotus squamatus	1.99	1.73	2.84	35.39
		Leptochiton asellus	2.21	1.7	2.79	38.18
		Galathea intermedia	1.82	1.55	2.54	40.72
		Caulleriella alata	1.5	1.41	2.31	43.03
		Gibbula tumida	1.74	1.37	2.26	45.28
		Musculus discors juv.	1.6	1.28	2.1	47.39
		Spio armata agg.	1.67	1.24	2.03	49.42
		Nuculana minuta	1.56	1.21	1.98	51.4
		Hiatella arctica	2.03	1.2	1.97	53.37
		Pholoe baltica	1.53	1.2	1.96	55.33
		Sabellaria spinulosa	1.79	1.19	1.95	57.28
		Callipallene brevirostris	1.86	1.17	1.92	59.2
		Eumida sanguinea	1.2	1.07	1.76	60.96
		Cheirocratus sp. female	1.24	1.03	1.69	62.66
		Melinna elisabethae	1.55	1	1.65	64.3
		Rissoa parva	1.52	0.99	1.63	65.93
		Scalibregma celticum	1.52	0.99	1.63	67.56
		Gnathia dentata	1.16	0.97	1.6	69.16
		Pholoe inornata	1.14	0.91	1.5	70.66
		Harmothoe sp.	1.41	0.89	1.46	72.12
		Syllis columbretensis	1.32	0.79	1.3	73.42
		Aonides oxycephala	1.02	0.79	1.3	74.72
		Scalibregma inflatum	0.99	0.77	1.27	75.99
		Harmothoe extenuata	0.96	0.76	1.24	77.23
		Abra alba	1.24	0.71	1.16	78.39
		NEMERTEA sp.	1.02	0.68	1.11	79.5
		Manzonina crassa	1.14	0.67	1.1	80.61
		Thoralus cranchii	1.09	0.67	1.1	81.71
		Parvicardium ovale	0.97	0.51	0.83	82.54
		Orchomene humilis	1	0.51	0.83	83.37
		Eteone longa agg.	0.84	0.5	0.82	84.19
		Polycirrus sp.	0.78	0.49	0.8	85
		Protodorvillea kefersteini	0.72	0.46	0.75	85.75
		Kurtiella bidentata	0.79	0.44	0.72	86.47

Sample	Textural group	Group n				
6	Sandy Gravel	Average similarity: 36.12				
8	Muddy Sandy Gravel					
21	Sandy Gravel	Species	Av.Abund	Av.Sim	Contrib%	Cum.%
23	Sandy Gravel	Sabellaria spinulosa	4.05	9.72	26.91	26.91
31	Gravel	Amphipholis squamata	1.07	3.1	8.59	35.5
32	Sandy Gravel	Polycirrus sp.	1	2.32	6.42	41.92
		Spio armata agg.	1.06	2.31	6.39	48.31
		NEMATODA sp.	1.13	2.04	5.65	53.96
		Lepidonotus squamatus	0.86	1.97	5.46	59.42
		Orchomene humilis	0.96	1.95	5.41	64.83
		NEMERTEA sp.	0.73	1.67	4.63	69.46
		Hiatella arctica	0.88	0.91	2.52	71.98
		Unciola crenatipalma	0.66	0.89	2.47	74.45
		Leptochiton asellus	0.7	0.78	2.15	76.6
		Glycera lapidum agg.	0.52	0.66	1.82	78.42
		Othomaera othonis	0.29	0.58	1.6	80.02
		Protodorvillea kefersteini	0.77	0.56	1.56	81.59
		Eumida sanguinea	0.37	0.52	1.44	83.03
		Achelia echinata	0.5	0.52	1.44	84.46
		Pholoe baltica	0.56	0.51	1.41	85.88
		Harmothoe impar	0.4	0.41	1.13	87.01
		Nototropis swammerdamei	0.36	0.4	1.12	88.13
		Galathea intermedia	0.41	0.4	1.1	89.23
		Ophiothrix fragilis	0.29	0.4	1.1	90.33

## Appendix 1 Survey Positions

Site	Date & Time	Depth (m)	Latitude	Longitude	Attempts	Sediment
1a	03/03/2013 16:17:38	16.80	53.641005	0.270412	2	Sandy gravel, pebble & shell, occ. cobble
1b	03/03/2013 16:21:43	16.49	53.641307	0.269983	2	Sandy gravel, pebble & shell, occ. cobble
1c	03/03/2013 16:31:22	16.76	53.641042	0.270147	4	Sandy gravel, pebble & shell, occ. cobble
2a	05/03/2013 17:37:54	16.92	53.652212	0.329182	2	Sandy gravel & pebbles
2b	05/03/2013 17:45:18	16.40	53.652070	0.329373	3	Sandy gravel & pebbles
2c	05/03/2013 17:47:01	16.55	53.652168	0.329368	3	Sandy gravel & pebbles
3a	17/01/2013 11:17:24	16.83	53.634278	0.302365	1	Sandy gravel, pebble, occ. cobble
3b	17/01/2013 11:24:56	17.13	53.634402	0.302632	2	Sandy gravel, pebble, occ. cobble
3c	17/01/2013 11:51:56	16.64	53.634540	0.302752	2	Sandy gravel, pebble, occ. cobble
4a	03/03/2013 10:35:22	19.75	53.662343	0.307188	6	Sandy gravel/pebbles & occ. cobble
4b	03/03/2013 11:05:11	19.48	53.661878	0.307475	2	Sandy gravel/pebbles & occ. cobble
4c	03/03/2013 11:13:46	19.26	53.661768	0.307578	3	Sandy gravel/pebbles & occ. cobble
5a	11/04/2013 09:48:09	15.15	53.604308	0.308830	2	Gravel with occ. cobble
5b	11/04/2013 09:56:22	14.94	53.604392	0.308873	2	Gravel with occ. cobble
5c	11/04/2013 10:05:16	14.97	53.604260	0.308920	8	Gravel with occ. cobble
6a	10/01/2013 13:08:45	18.04	53.647220	0.206582	2	Sandy gravel, pebble & shell
6b	10/01/2013 13:26:52	18.08	53.647162	0.206748	3	Sandy gravel, pebble & shell
6c	10/01/2013 13:33:10	18.04	53.647308	0.206690	1	Sandy gravel, pebble & shell
7a	03/03/2013 15:31:45	17.07	53.653428	0.241170	3	Sandy gravel, pebble & shell
7b	03/03/2013 15:39:26	17.28	53.653465	0.241150	2	Sandy gravel, pebble & shell
7c	03/03/2013 16:01:19	17.47	53.653178	0.240912	2	Sandy gravel, pebble & shell
8a	10/01/2013 10:36:59	13.56	53.642158	0.163317	1	Slightly muddy gravel/sandy gravel & pebbles
8b	10/01/2013 11:00:18	13.99	53.642033	0.163472	3	Slightly muddy gravel/sandy gravel & pebbles
8c	10/01/2013 11:08:15	14.05	53.641973	0.163587	2	Slightly muddy gravel/sandy gravel & pebbles
9a	05/03/2013 16:14:01	30.11	53.823292	0.241642	2	Muddy mixed gravel
9b	05/03/2013 16:21:44	29.72	53.823323	0.242257	2	Muddy mixed gravel
9c	05/03/2013 16:28:45	29.29	53.823223	0.242117	2	Muddy mixed gravel
10a	05/03/2013 15:30:57	25.36	53.819835	0.220528	3	Muddy gravel, pebbles & occ. cobble
10b	05/03/2013 15:38:10	25.45	53.819832	0.220727	4	Muddy gravel, pebbles & occ. cobble
10c	05/03/2013 15:59:53	25.12	53.820367	0.220305	4	Muddy gravel, pebbles & occ. cobble
11a	06/03/2013 13:10:15	16.09	53.477352	0.403110	6	Slightly muddy gravel/sandy gravel & pebbles
11b	06/03/2013 13:20:27	15.15	53.476995	0.402958	2	Slightly muddy gravel/sandy gravel & pebbles
11c	06/03/2013 13:35:15	15.79	53.477482	0.402865	5	Slightly muddy gravel/sandy gravel & pebbles
12a	06/03/2013 14:00:59	15.48	53.482620	0.424040	2	Slightly muddy gravel/sandy gravel & pebbles with occ. cobble
12b	06/03/2013 14:11:27	15.39	53.482523	0.424013	3	Slightly muddy gravel/sandy gravel & pebbles with occ. cobble
12c	06/03/2013 14:17:16	15.58	53.482317	0.424388	2	Slightly muddy gravel/sandy gravel & pebbles with occ. cobble
13a	03/03/2013 12:27:16	16.92	53.656713	0.284642	5	Slightly muddy - gravel, pebbles & occ. cobble
13b	03/03/2013 12:34:17	16.52	53.656863	0.284265	2	Slightly muddy - gravel, pebbles & occ. cobble
13c	03/03/2013 12:51:27	16.12	53.656937	0.284423	4	Slightly muddy - gravel, pebbles & occ. cobble
14	17/01/2013 13:55:16	16.03	53.665652	0.328743	3	Sandy gravel & pebbles
15	03/03/2013 13:03:44	17.37	53.670572	0.278835	1	Muddy - gravel, pebbles & occ. cobble
16	03/03/2013 17:09:55	15.36	53.649723	0.312688	5	Slightly muddy gravel/sandy gravel & pebbles

Site	Date & Time	Depth (m)	Latitude	Longitude	Attempts	Sediment
17	17/01/2013 11:04:43	19.23	53.629480	0.283930	2	Sandy gravel & pebbles
18	17/01/2013 10:51:06	17.16	53.616153	0.285628	3	Sandy gravel & pebbles
19	03/03/2013 17:23:48	17.40	53.639255	0.328620	2	Gravel & pebbles
20	03/03/2013 17:35:48	18.04	53.624487	0.315277	4	Sandy gravel, pebbles, occ. cobble
21	05/03/2013 11:51:51	19.66	53.596123	0.274145	3	Slightly muddy gravel/sandy gravel
22	06/03/2013 16:54:06	15.58	53.597330	0.333200	9	Slightly muddy gravel/sandy gravel
23	06/03/2013 17:41:30	13.78	53.583132	0.311543	6	Slightly muddy gravel/sandy gravel
24	05/03/2013 13:16:46	21.31	53.690298	0.271578	4	Slightly muddy gravel/sandy gravel & pebbles
25	05/03/2013 13:43:41	21.76	53.695753	0.309157	5	Slightly muddy gravel/sandy gravel & pebbles
26	10/01/2013 11:41:02	15.00	53.642608	0.179218	2	Slightly muddy gravel/sandy gravel & pebbles/shell
27	17/01/2013 13:31:27	18.90	53.678510	0.320170	1	Slightly muddy gravel/sandy gravel & pebbles/shell
28	05/03/2013 14:45:35	20.09	53.712357	0.242225	4	Sandy gravel, pebble & shell, occ. cobble
29	10/01/2013 12:12:21	16.55	53.635738	0.207328	1	Muddy gravel/sandy gravel & pebbles/shell
30	03/03/2013 13:35:43	14.66	53.673410	0.196023	3	Slightly muddy gravel/sandy gravel & pebbles
31a	10/01/2013 15:26:18	17.77	53.619723	0.194230	2	Sandy gravel & pebbles
31b	10/01/2013 15:35:05	17.98	53.619010	0.194592	2	Sandy gravel & pebbles
31c	10/01/2013 15:53:30	18.17	53.619438	0.194410	3	Sandy gravel & pebbles
32a	03/03/2013 14:02:01	14.14	53.666877	0.169888	5	Sandy gravel & pebbles
32b	03/03/2013 14:06:25	13.90	53.666898	0.169535	1	Sandy gravel & pebbles
32c	03/03/2013 14:47:21	13.53	53.667137	0.169622	4	Sandy gravel & pebbles
35a	06/03/2013 16:01:45	15.24	53.575425	0.327332	9	Slightly muddy sandy gravel, pebbles & occ. cobble
35b	06/03/2013 16:05:38	15.24	53.575180	0.327575	1	Slightly muddy sandy gravel, pebbles & occ. cobble
35c	06/03/2013 16:07:36	15.15	53.575443	0.327333	1	Slightly muddy sandy gravel, pebbles & occ. cobble
36a	05/03/2013 14:05:37	21.85	53.702703	0.286063	4	Slightly muddy sandy gravel, pebbles & occ. cobble
36b	05/03/2013 14:09:31	21.73	53.702047	0.286573	1	Slightly muddy sandy gravel, pebbles & occ. cobble
36c	05/03/2013 14:25:36	21.52	53.702107	0.286378	4	Slightly muddy sandy gravel, pebbles & occ. cobble
37a	05/03/2013 12:41:14	21.92	53.684190	0.290995	4	Sandy gravel, pebble, occ. cobble
37b	05/03/2013 12:50:29	21.89	53.684073	0.291207	3	Sandy gravel, pebble, occ. cobble
37c	05/03/2013 12:58:07	21.76	53.684157	0.291095	3	Sandy gravel, pebble, occ. cobble
38	03/03/2013 13:18:05	14.45	53.663927	0.220663	2	Gravel, shell & pebbles
39	11/04/2013 13:09:16	14.75	53.627063	0.249605	4	Slightly muddy - sandy gravel, pebbles & occ. cobble
40	03/03/2013 16:45:36	16.43	53.644922	0.289285	3	Slightly muddy - sandy gravel & pebbles
41	05/03/2013 12:16:41	19.14	53.652537	0.260865	5	Sandy gravel & pebbles
42	11/04/2013 11:51:19	14.14	53.655762	0.319448	9	Gravel & pebbles with occ. cobble



## Appendix 2 Grab Sample Photographs



Sample 1a



Sample 1b



Sample 1c







Sample 2a



Sample 2b



Sample 2c







Sample 3a



Sample 3b



Sample 3c





Sample 4a



Sample 4b



Sample 4c





Sample 5a



Sample 5b



Sample 5c







Sample 6a



Sample 6b



Sample 6c





Sample 7a



Sample 7b



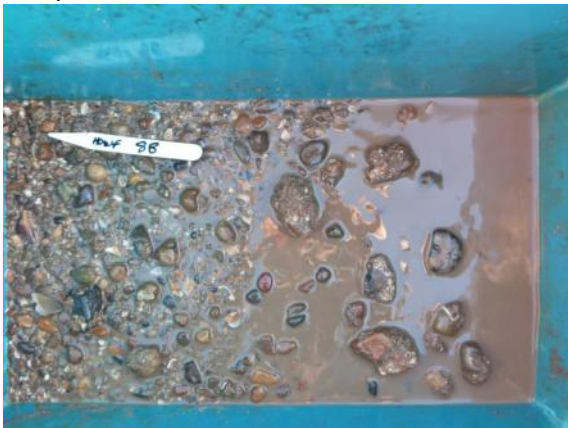
Sample 7c







Sample 8a



Sample 8b



Sample 8c





Sample 9a



Sample 9b







Sample 9c



Sample 10a





Sample 10b



Sample 10c



Sample 11a







Sample 11b



Sample 11c



Sample 12a







Sample 12b



Sample 12c





Sample 13a



Sample 13b



Sample 13c





Sample 14



Sample 15



Sample 16







Sample 17



Sample 18



Sample 19







Sample 20



Sample 21



Sample 22







Sample 23



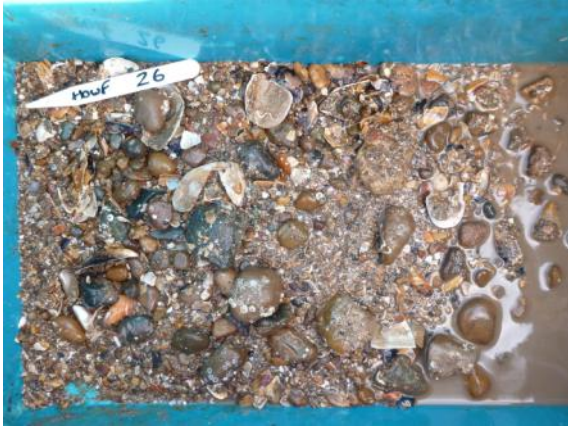
Sample 24



Sample 25







Sample 26



Sample 27



Sample 28





Sample 29



Sample 30



Sample 31a





Sample 31b



Sample 31c



Sample 32a







Sample 32b



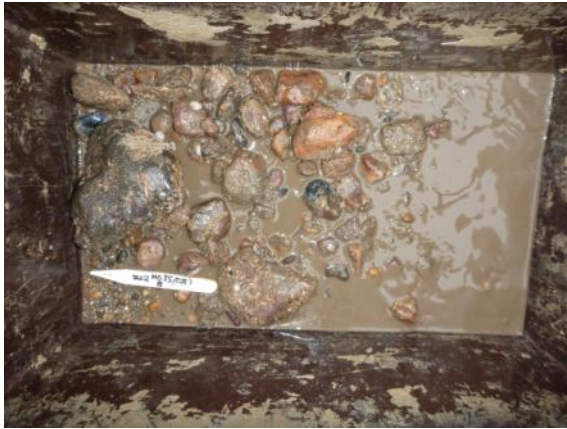
Sample 32c



Sample 35a







Sample 35b



Sample 35c



Sample 36a







Sample 36b



Sample 36c



Sample 37a







Sample 37b



Sample 37c



Sample 38







Sample 39



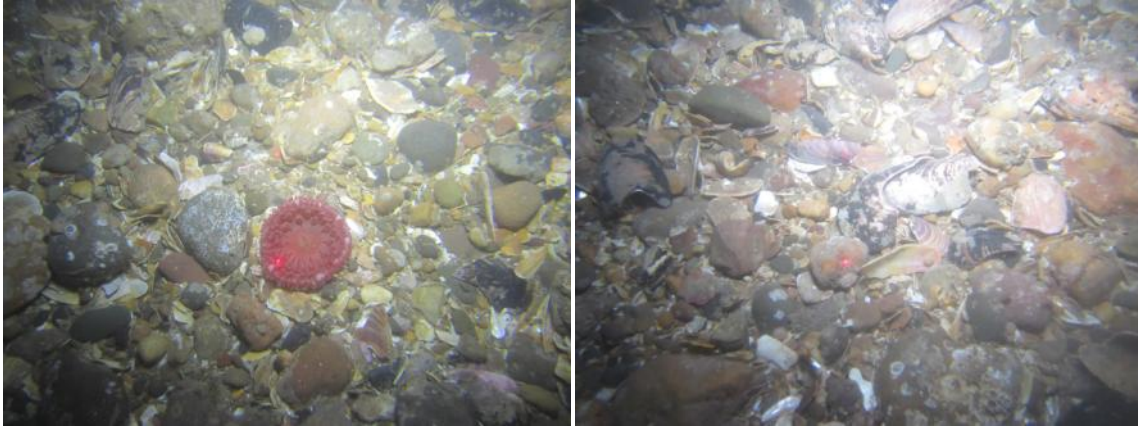
Sample 40



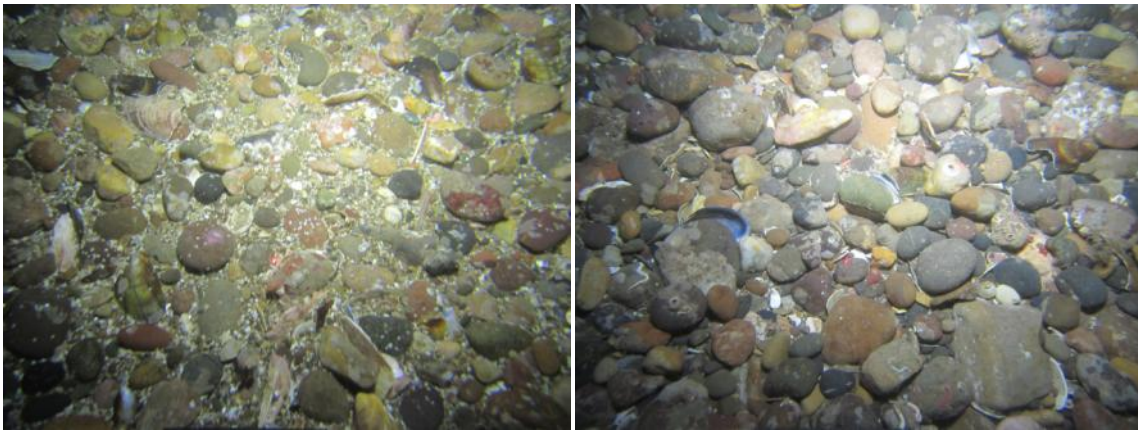
Sample 41



### Appendix 3 Seabed Stills



Site 1

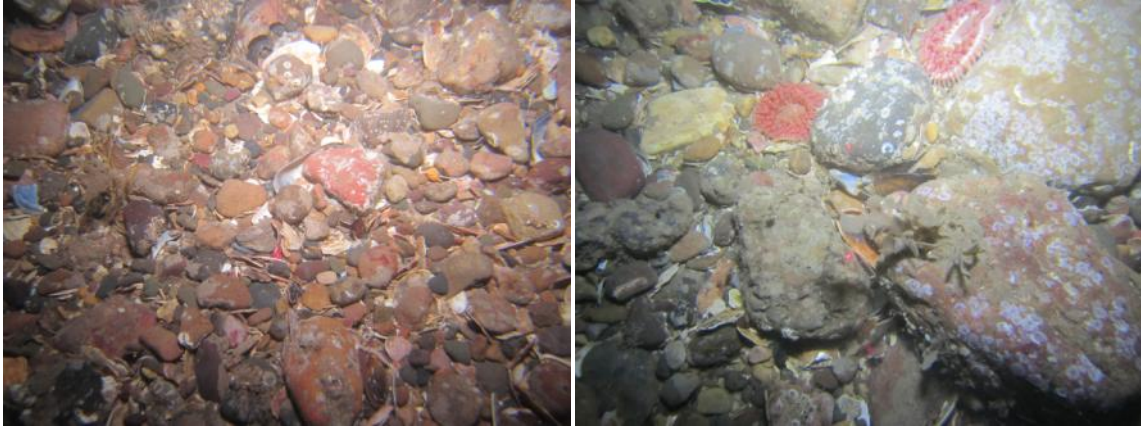


Site 2

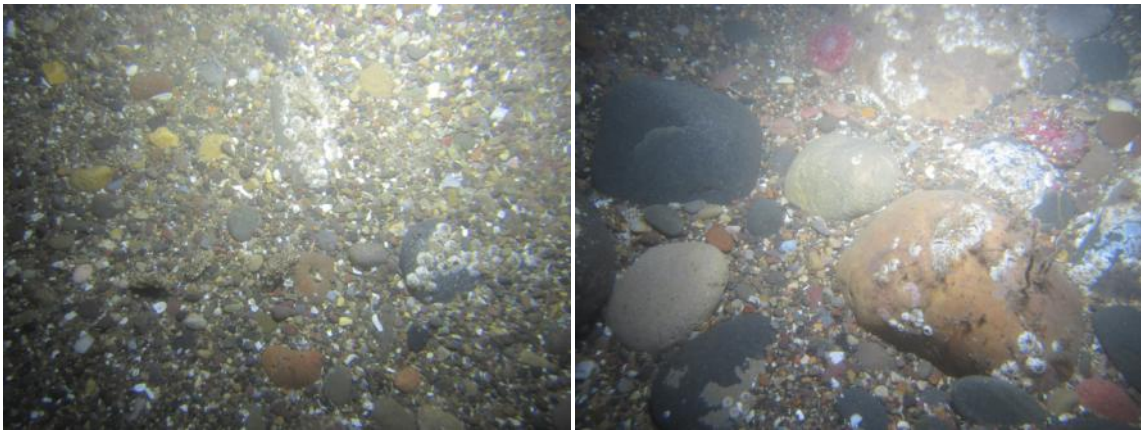


Site 3





Site 4



Site 5

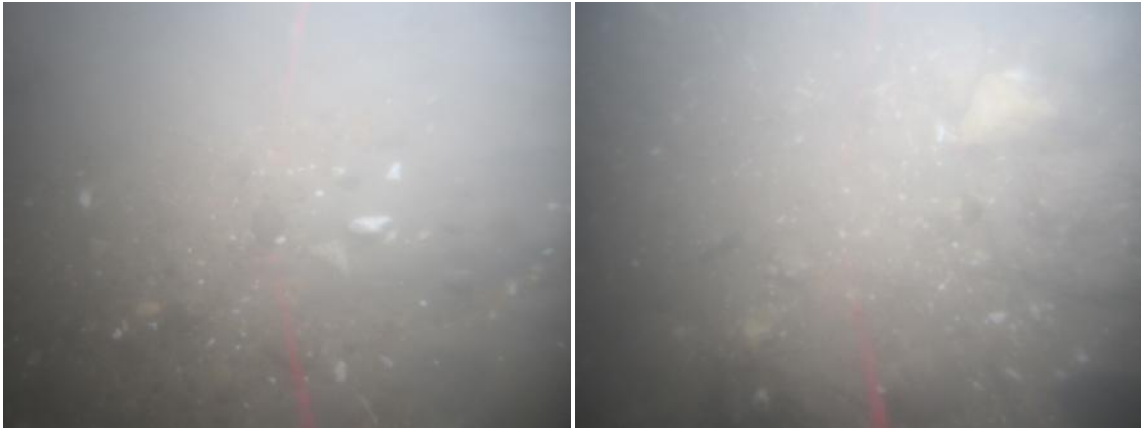


Site 6

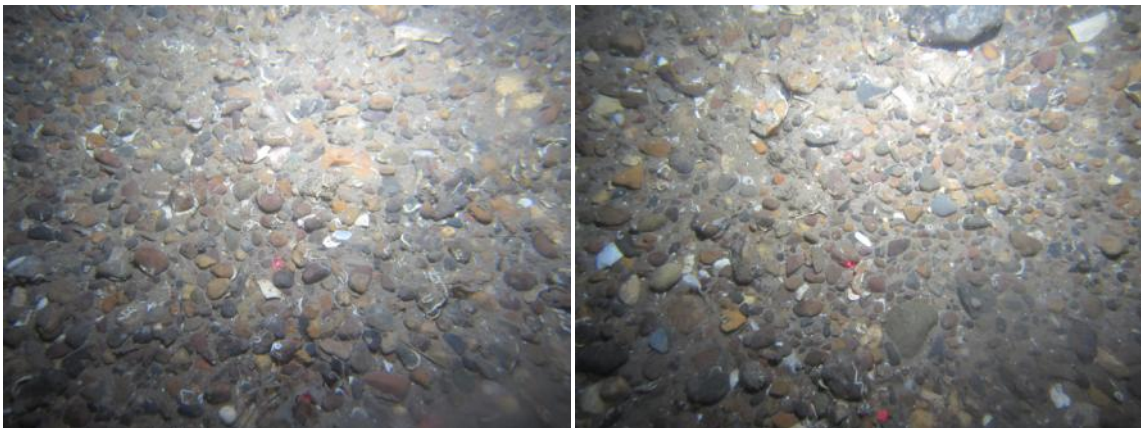




Site 7



Site 8



Site 9



Site 10

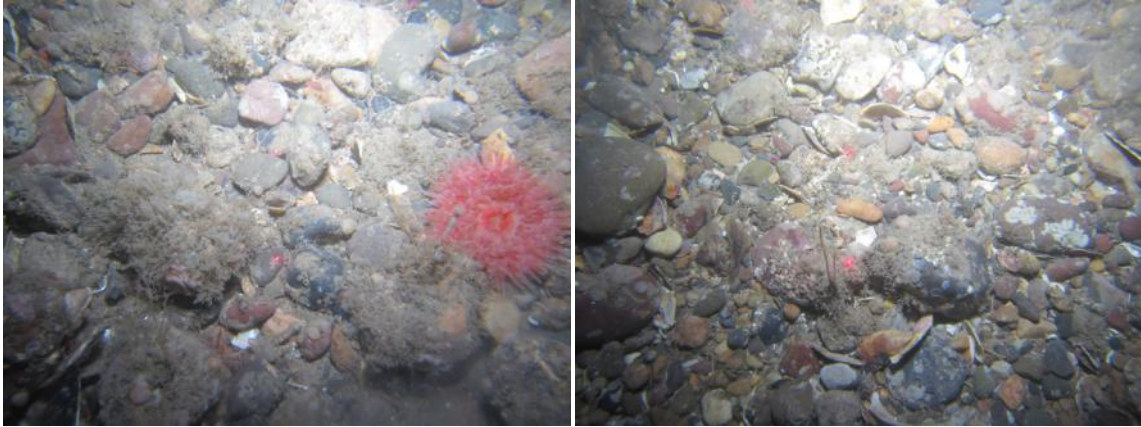


Site 13

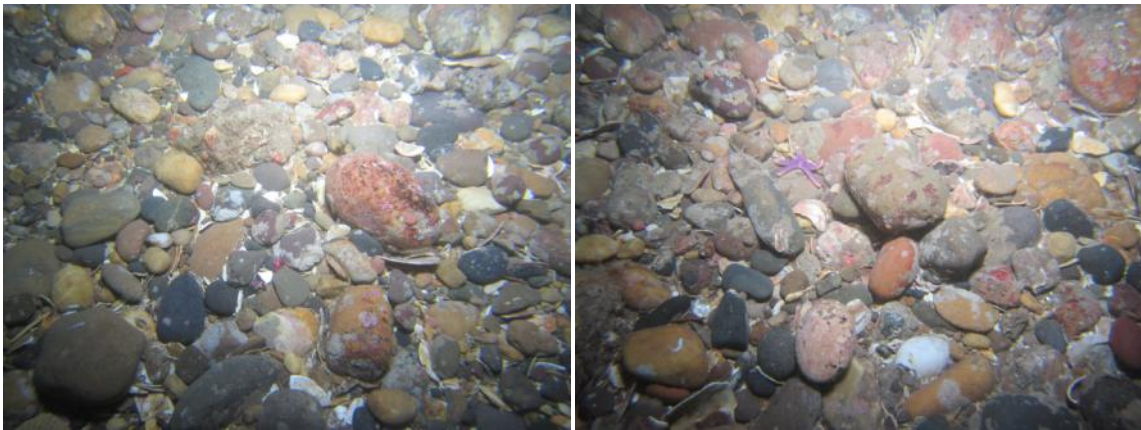


Site 14





Site 15



Site 16



Site 17

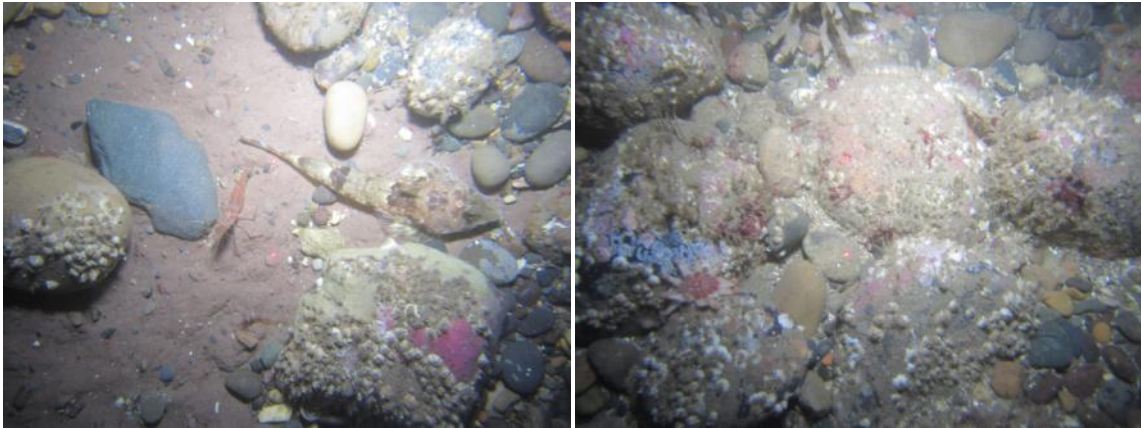




Site 18

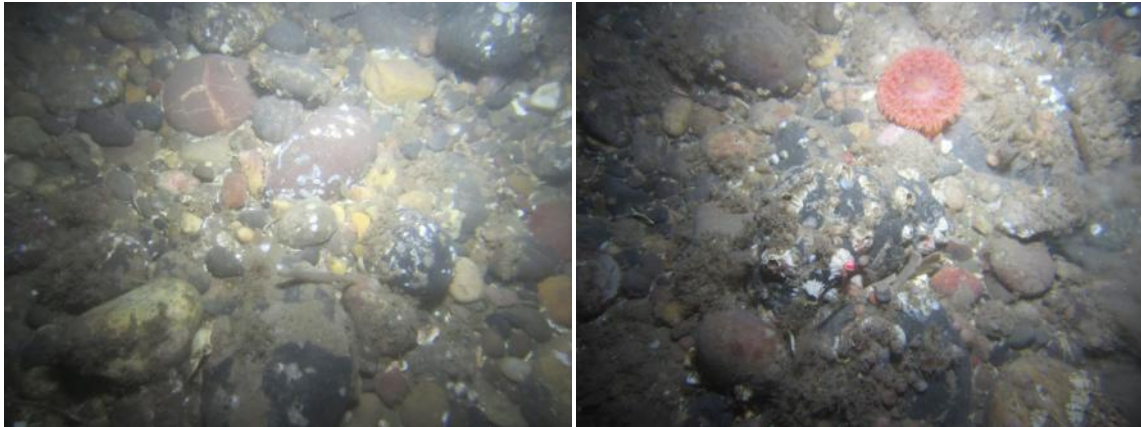


Site 19

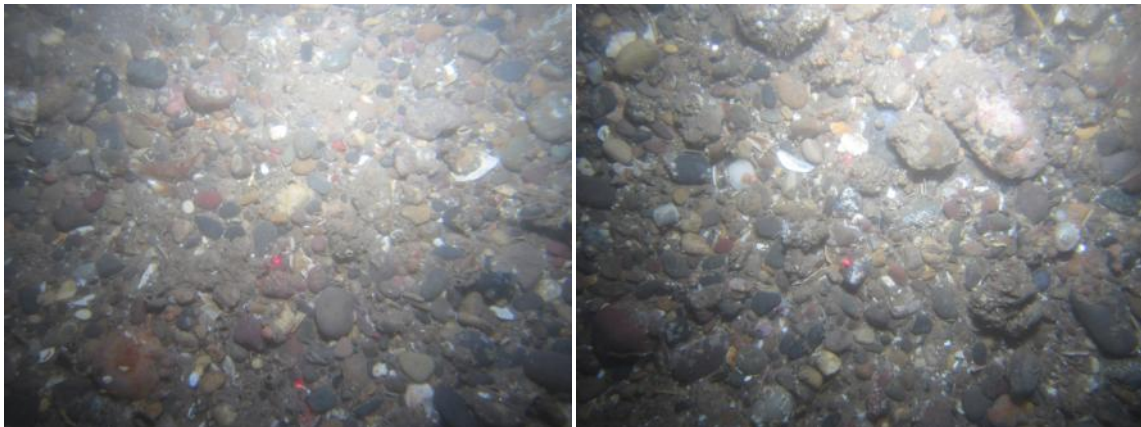


Site 19

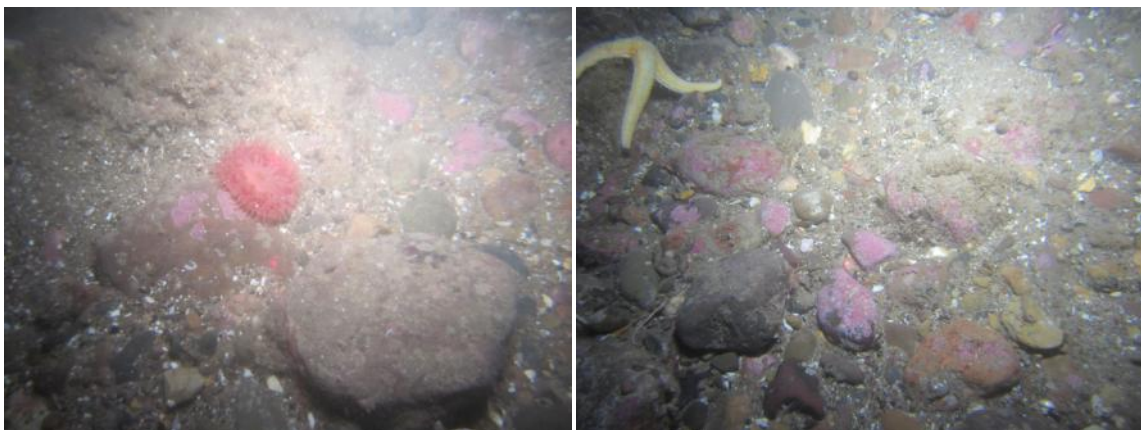




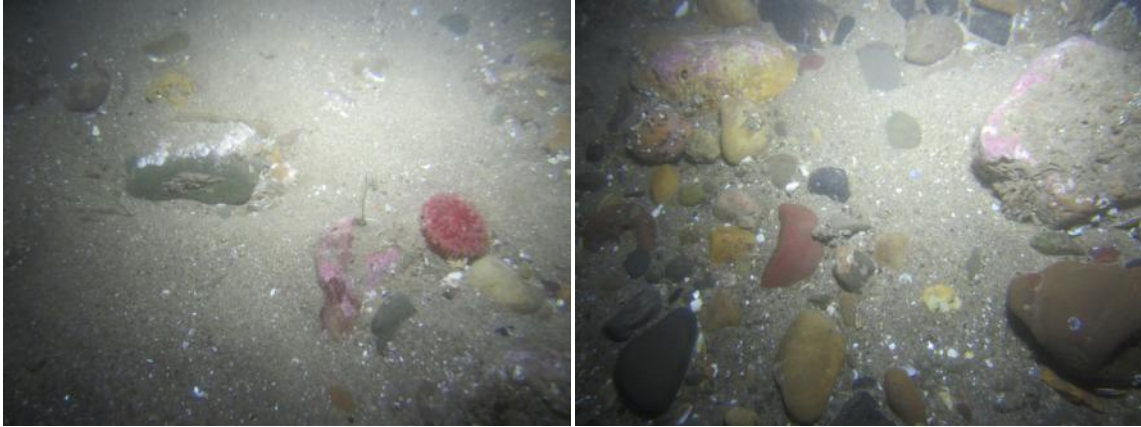
Site 20



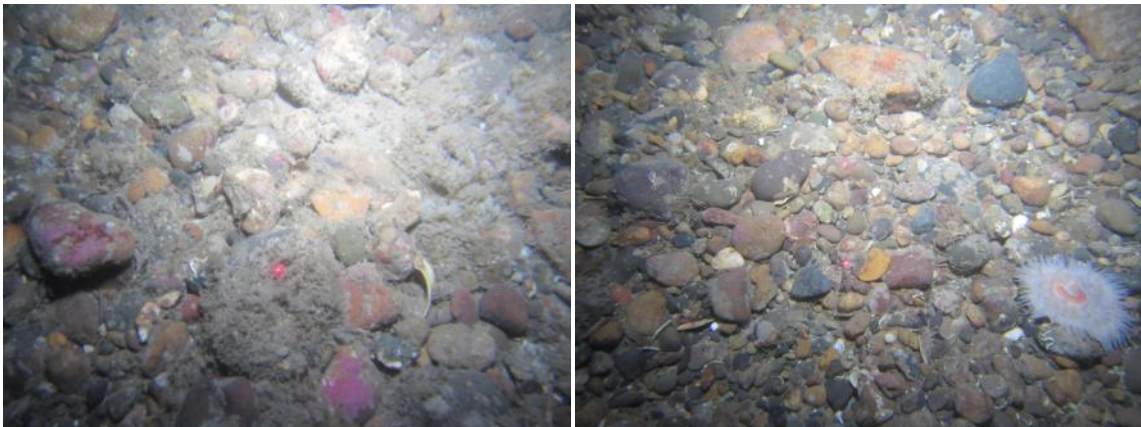
Site 21



Site 22

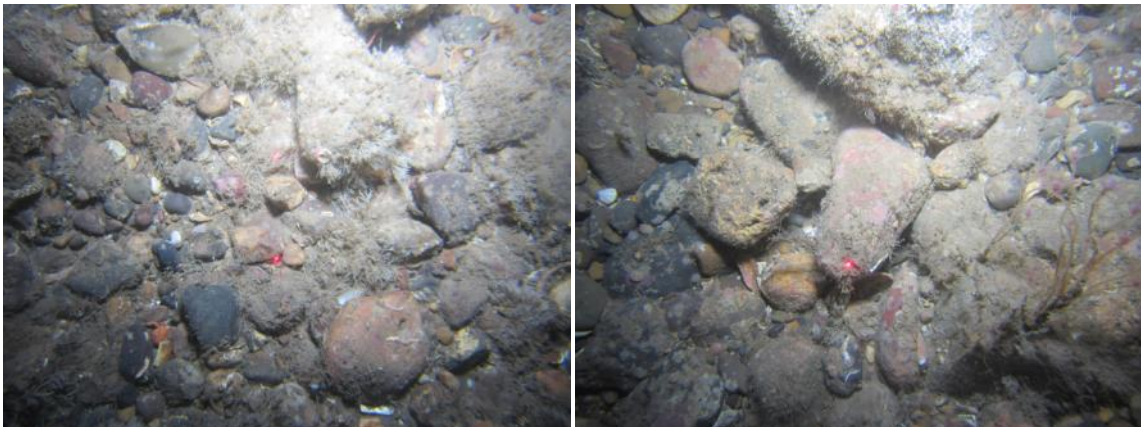


Site 23



24

Site

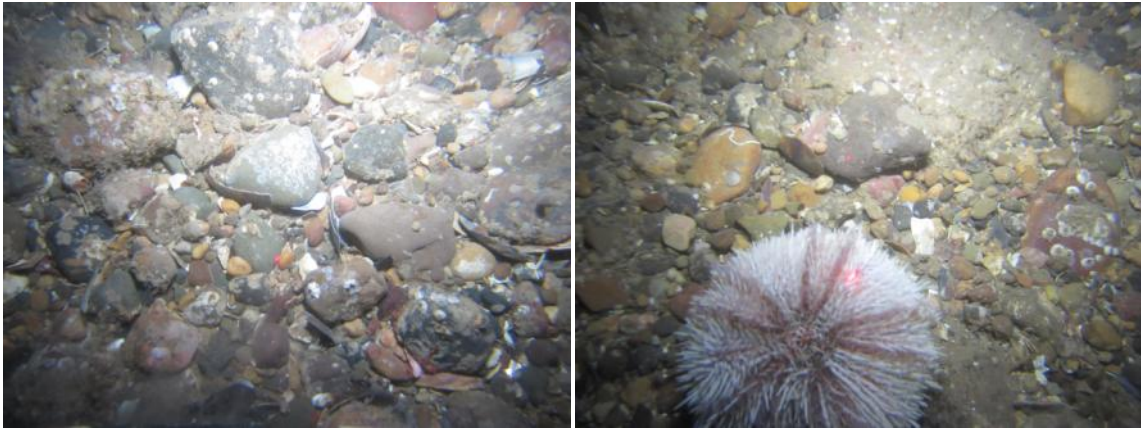


Site 25





Site 26



Site 27



Site 28





Site 29



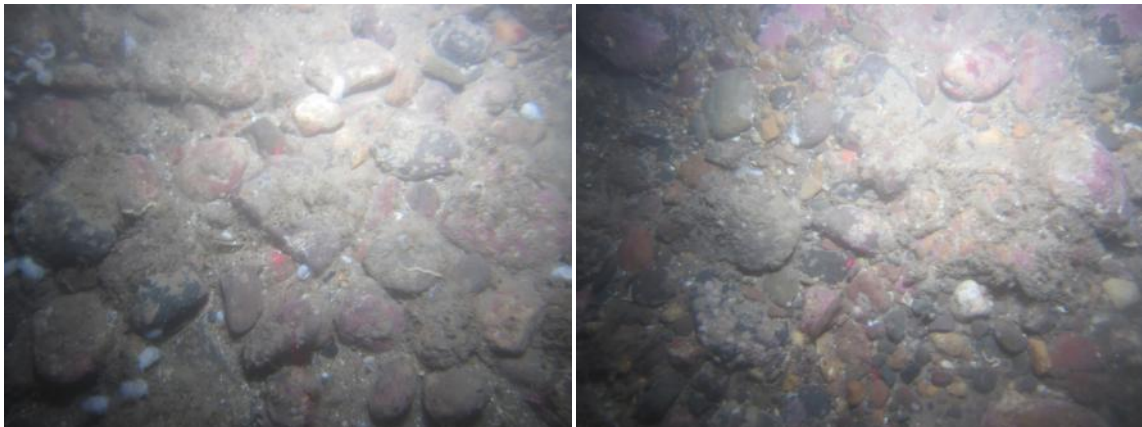
Site 30



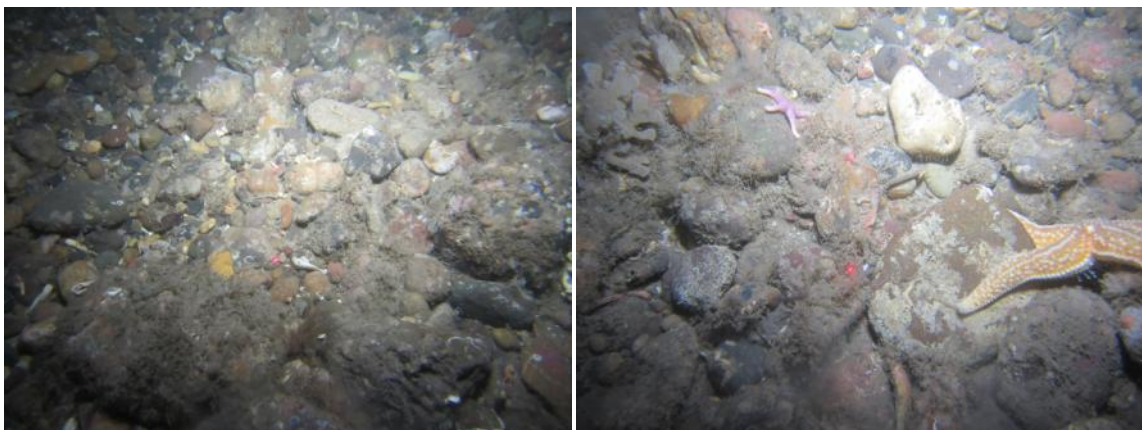
Site 31



Site 32



Site 35



Site 36

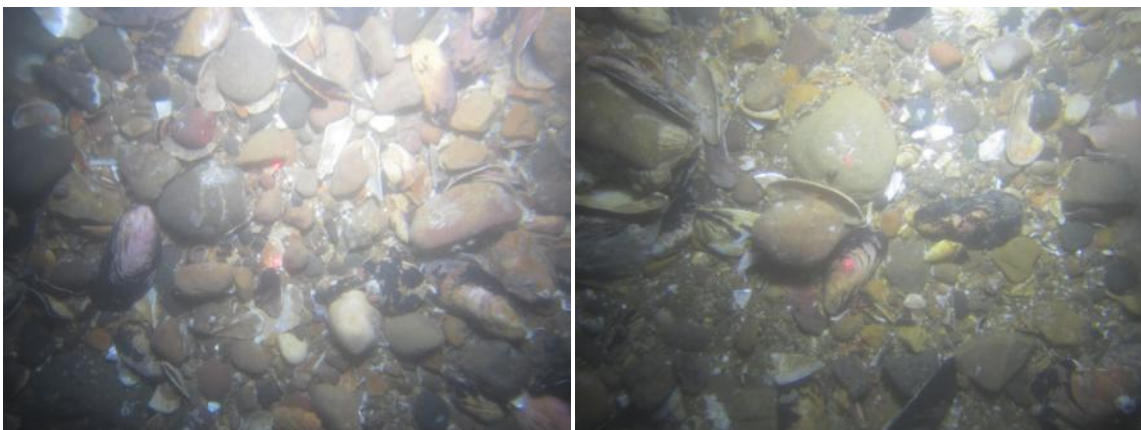




Site 37



Site 38



Site 39





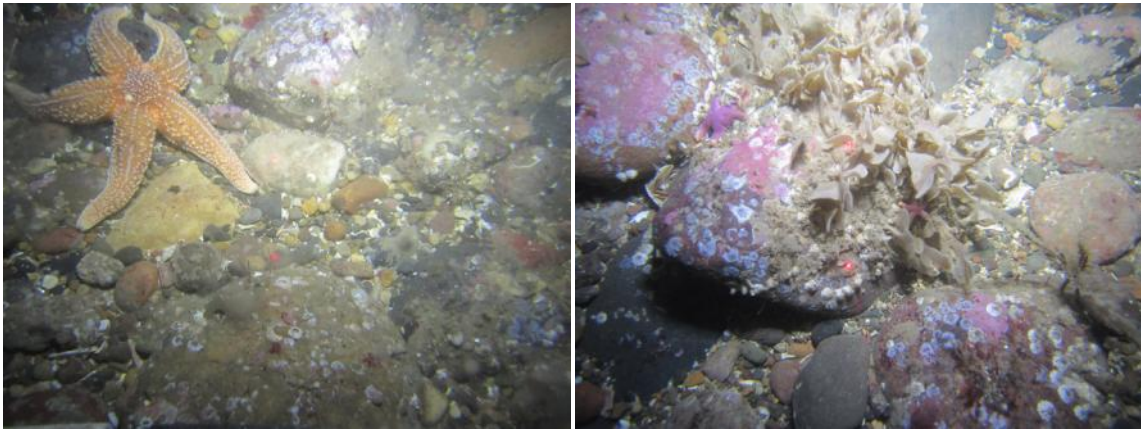
Site 40



Site 41



Site 42



Site 42

## Appendix 4 Species Abundance Data

	1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C	
Edwardsiidae sp.																1						
TURBELLARIA sp.					1																	
NEMERTEA sp.		2	2	1		1	1		3	1	9	2	2			1	1		6	2	5	
NEMATODA sp.	14	23		1	2	5	1	3	1	2	8	6		3	3			2			2	
Goffingia vulgaris vulgaris	4	1				1					1								1			
Phascolion strombus strombus																						
Pisione remota																						
Polynoidae sp.	1			1	4	3	2											2			2	
Gattyana cirrhosa																						
Harmothoe sp.		2										1							3			
Malmgreniella castanea																						
Harmothoe abyssicola																						
Harmothoe extenuata				1																		
Harmothoe fragilis					2	1	2	1				1										
Harmothoe fraserthomsoni	1																					
Harmothoe impar		1	2		2	2	1	8									2		2		2	
Harmothoe pagenstecheri								1														
Lepidonotus squamatus	2	5	2		2		2	3	4							3	1		1		5	
Pholoe inornata					1	1													1	1	1	
Pholoe baltica	4	2	1	4	2	9	3				1								4	2	1	
Sthenelais boa						1																
Eteone longa agg.		3		3	1			1								1			1	1		
Eteone foliosa					1																	
Eulalia expusilla																						
Eumida sanguinea	1	1									1										1	
Glycera alba																						
Glycera lapidum agg.	2	3	2	1		3	2	2	1	2	5	1				1		4	2		1	
Glycera oxycephala																						
Glycinde nordmanni					1																1	
Goniada maculata						1																
Sphaerodorum gracilis					1																	
Kefersteinia cirrata																						
Nereimyra punctata																						
Syllidia armata																						
Syllidae epitoke									2													
Syllis columbretensis	1	5	1	4	2	4		1		1									7	4	2	
Syllis garciai										1												
Syllis armillaris	13	1	1			1			4												1	
Syllis variegata											1											
Eusyllis blomstrandii			1																			
Syllides sp.																						
Exogone dispar		1																				
Exogone hebes																						
Exogone verugera		1																				
Sphaerosyllis taylori	1	4	2																			
Autolytus sp.																						
Eunereis longissima																		1			1	
Nephtys juv.																			1			
Nephtys caeca				1					1								1				1	
Nephtys cirrosa																						
Nephtys kersivalensis																						
Nephtys pente					1																	
Lumbrineridae sp. Fragments									P													
Lumbrineris cingulata																						
Protodorvillea kefersteini		1																			2	
Scoloplos armiger						2																
Paradoneis lyra																						
Poecilochaetus serpens																						
Aonides oxycephala		2			4	6	1	1		1		1										
Aonides paucibranchiata		5					1				5									2		
Laonice sp. juv.		1								1												
Laonice bahusiensis											1	1										
Polydora caeca																				1		
Polydora caulleryi																						
Prionospio sp.																						
Pseudopolydora pulchra																						
Spio armata agg.		1	7	4	9		2	5	14	4	8	3				1	2	5	2	7		
Spiophanes bombyx																						
Spiophanes kroyeri					1																	
Aphelochaeta sp. 'A'									1													
Aphelochaeta marioni		1																			1	
Cauleriella alata					1		1	1	1												1	
Cauleriella zetlandica																						



	1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C
<i>Cirriformia</i> sp. juv.	1																				
<i>Cirriformia tentaculata</i>																			1		1
<i>Caulerielia killariensis</i>				1																	
<i>Capitella</i> sp.					1																
<i>Mediomastus fragilis</i>		3		6	6	1													1	3	2
<i>Notomastus</i> sp.																					
<i>Maldanidae</i> sp.						3										P					
<i>Clymenura</i> sp.									1												1
<i>Microclymene triccirrata</i>																					
<i>Clymenura johnstoni</i>		3	1	5																	
<i>Praxillella affinis</i>																					
<i>Ophelia borealis</i>													1								
<i>Scalibregma celticum</i>				2		1			1	1									2	1	1
<i>Scalibregma inflatum</i>				2	1														2		
<i>Galathowenia oculata</i>																					
<i>Owenia fusiformis</i>							1														
<i>Lagis koreni</i>																					
<i>Sabellaria spinulosa</i>		5	3	1		1	1	1	4			1						3	7	1	5
<i>Melinna elisabethae</i>																					1
<i>Ampharetinae</i> sp. juv.																					
<i>Ampharete lindstroemi</i>									1												
<i>Anobothrus gracilis</i>																					
<i>Terebellides stroemi</i>																					
<i>Trichobranthus glacialis</i>																					
<i>Terebellidae</i> sp. juv.																					
<i>Eupolymnia nesidensis</i>																					
<i>Lanice conchilega</i>								1													
<i>Amphitrite</i> sp.																					
<i>Pista</i> sp.																					
<i>Polycirrus</i> sp.	1	5			2				2		1							1	2	1	2
<i>Thelepus setosus</i>																					
<i>Sabellidae</i> sp.																					
<i>Chone</i> sp.		1							1		6	2									
<i>Euchone rubrocincta</i>																					
<i>Jasmineira caudata</i>																					
<i>Pseudopotamilla reniformis</i>		1																			1
<i>Sabella pavonina</i>																					
<i>Hydroides norvegica</i>					1																
<i>Spirobranchus</i> sp.																					
<i>Spirobranchus lamarcki</i>	1			1														1	1		
<i>Spirobranchus triqueter</i>				1	3			1	1		1										
<i>Limnodriloides</i> sp.																					
<i>Nymphon brevistre</i>		1																			
<i>Achelia echinata</i>	2	1					2	8	5	1									5	1	
<i>Endeis spinosa</i>																					
<i>Callipallene brevistris</i>					3				1			2							1		
<i>Nebalia bipes</i>																					
<i>Eusirus longipes</i>																					
<i>Gammarellus homari</i>																					
<i>Perioculodes longimanus</i>																					
<i>Amphilocheus manudens</i>			1																		
<i>Urothoe elegans</i>																			1		
<i>Harpinia antennaria</i>																					
<i>Metaphoxus fultoni</i>																					
<i>Orchomene humilis</i>		1	1		1		17	8	4							1	1		1	1	
<i>Orchomenella nana</i>			1		2	1		1													
<i>Tmetonyx cicada</i>																					
<i>Tmetonyx similis</i>																					
<i>Iphimedia</i> sp.																					
<i>Nototropis swammerdamei</i>										1									1		
<i>Ampelisca diadema</i>																					
<i>Ampelisca spinipes</i>				1																	
<i>Cheirocratus</i> sp. female		1	1	1	3												3	1			
<i>Cheirocratus assimilis</i>																					
<i>Cheirocratus intermedius</i>																			1		
<i>Othomæra othonis</i>		1					2	1									1				
<i>Gammaropsis maculata</i>																					
<i>Leptocheirus hirsutimanus</i>																					
<i>Crassicorophium bonellii</i>																					
<i>Crassicorophium crassicorne</i>																					
<i>Unciola crenatipalma</i>																					
<i>Dyopodos porrectus</i>									8												
<i>Pseudoprotella phasma</i>																					
<i>Gnathia</i> juv. & females																					
<i>Gnathia dentata</i>		1	1																		
<i>Janira maculosa</i>						1	1		1												1
<i>Munna minuta</i>																					1

	1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C	
Pleurogonium rubicundum																						
Tanaopsis graciloides																						
Bodotria scorioides								1														
Thoralus cranchii		1							1							2	4	8	2	2		
Pandalina brevisstris																						
Pandalus montagui																						
Anapagurus hyndmanni			1															1				
Pagurus bernhardus																						
Galathea intermedia		1	2	4	6	5	4	16	4		2					1	4	1	1	1	2	
Pisidia longicornis	3	2	13	8	55	22	81	85	2		7							1	9		4	
Ebalia sp. juv.								1														
Ebalia tuberosa	1					1	1			1												
Ebalia tumefacta											1											
Majidae sp. juv.									1													
Inachus sp.																						
Macropodia sp. juv.																						
Macropodia linaresi																						
Eurynome aspersa																						
Cancer pagurus																						
Liocarcinus pusillus						1																
Pilumnus hirtellus																						
Leptochiton asellus		7	1	1	4	4	1	3		4								2	4	1	1	
Gastropoda sp.																	1					
Gibbula tumida	3	2		4	6	1	3	10		2	3	1						2			2	
Gibbula cineraria		2		1		2													6		2	
Calliostoma zizyphinum					1		1					1										
Rissoa parva																						
Alvania punctura								1														
Manzonina crassa	1				2			1											13		4	
Onoba semicostata	2		1		6			1											19		38	
Crepidula fornicata					1																	
Trivia arctica																						
Euspira pulchella																						
Vitreolina philippi															1							
Boreotrophon truncatus	1								1											1		
Ocenebra erinaceus		1						2	1	1												
Hinia incrassata					2			1														
Oenopota rufa																						
Odostomia turrita																						
Brachystomia scalaris					2																	
Nudibranchia sp.																						
Goniodoris sp.								2														
Onchidorididae sp.					1																	
Onchidoris muricata				1				3														
Bivalvia sp. # siphon																						
Nucula nucleus					2														8		2	
Nuculana minuta					2														2			
Mytilus edulis juv.					7							1										
Modiolus juv.	1		1		2	1	2	2	1											2		
Modiolarca tumida																						
Musculus discors juv.								2														1
Palliolium tigerinum																						
Anomiidae sp. juv.												1						1				
Anomia ephippium																						
Lucinoma borealis																						
Hemilepton nitidum																						
Kurtiella bidentata																			1	1		
Goodallia triangularis				1	7						1	3	4	2								
Astarte montagui								1			1											
Parvicardium ovale						1																1
Parvicardium scabrum																						
Spisula sp. juv.																						
Spisula elliptica		2	1															1				
Ensis sp. damaged																						
Gari tellinella												1										1
Abra alba					2			1											1			
Clausinella fasciata					1			2														1
Timoclea ovata					1			1			1										1	
Tapes rhomboides																						
Dosinia exoleta																						
Mya sp. juv.					3			1					1									
Mya arenaria		1		2		1										1				2		
Hiatella arctica	1	1	1		3	2			3	1		2					1		2		4	
Phoronis sp.				2	3						1									5		1
Asteroidea sp. juv.	1																					
Crossaster papposus juv.																						
Henricia sp. juv.																						

	1A	1B	1C	2A	2B	2C	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C	
Henricia oculata																						1
Asterias rubens																						
Ophiothrix sp. juv.																						
Ophiothrix fragilis	1	1							1								1		2		1	
Ophiactis balli																				2		
Ophiopholis aculeata	12	11	4				1	2	1											2		
Amphiuridae juv.					1				1													
Amphipholis squamata		5	4	2	21	5	4	8	1	7	5	4	1				4		11	1	3	
Ophiuridae juv.																						
Ophiura albida																						
Echinocyamus pusillus																						
Thyone fusus																						
Porifera sp.		P	P																			
Leucosolenia sp.																						
Sycon ciliatum																						
Cliona sp.																						
Tubularia sp.										P												
Halecium sp.																						
Hydrallmania falcata								P											P			
Sertularia sp.	P			P	P					P	P	P	P				P	P	P	P	P	P
Plumulariidae sp.											P											P
Nemertesia sp.		P																		P		
Nemertesia ramosa																						P
Campanulariidae sp.											P											
Alcyonium digitatum																						
ACTINIARIA sp.							P															
Filograninae sp.																						
Filograna implexa																						
Salmacina dysteri										P												
Cirripedia sp.																						
Verruca stroemi			P	P	P	P	P			P												
Balanus sp. juv.			P																			
Balanus crenatus	P	P	P		P	P	P			P	P		P							P	P	P
Crisidia cornuta							P	P	P			P							P	P		
Crisia sp.	P	P	P	P	P	P	P	P	P	P	P	P							P	P	P	P
Tubulipora sp.	P	P	P		P	P	P			P	P										P	P
Alcyonium diaphanum		P	P		P	P	P	P	P	P	P				P	P	P	P	P	P	P	P
Vesicularia spinosa									P	P												
Amathia lendigera					P	P	P	P	P	P	P					P	P	P	P	P	P	P
Conopeum reticulum						P																
Electra pilosa		P			P	P	P	P			P	P						P	P	P		
Flustra foliacea					P	P	P	P														
Securiflustra securifrons			P																			
Callopora sp.		P	P		P	P	P	P			P									P	P	
Callopora rylandi			P								P											
Amphiblestrum auritum	P				P	P	P													P	P	P
Bugula flabellata																						
Bicelliaria ciliata									P	P	P		P									
Scrupocellaria scruposa	P	P	P	P	P	P	P	P	P	P	P				P		P	P	P	P	P	P
Cellaria sp.							P															
Chorizopora bronniartii																						
Escharoides coccinea		P	P	P	P				P													
Escharella immersa	P	P	P	P	P	P	P			P		P								P	P	P
Escharella ventricosa	P		P				P	P			P											
Phaeostachys spinifera	P	P		P	P	P	P			P	P										P	
Parasmittina trispinosa																						
Schizomavella sp.	P		P	P	P		P	P			P	P										P
Microporella ciliata	P			P	P	P	P			P												
Cellepora pumicosa	P			P				P		P	P											
Turbicellepora avicularis		P			P		P				P											P
Didemniidae sp.				P	P	P														P		P
Dendrodoa grossularia	P	P	P	P	P	P	P		1	P										P	P	P
Molgula sp.			P				P															
Corallinaceae sp.																						
Plocamium cartilagineum																						



	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C	13A	13B	13C	14	15	16	
Edwardsiidae sp.																						
TURBELLARIA sp.								1	1													
NEMERTEA sp.		1		4	8	8	1	1	1		1	5	4	3	3		3	2	1		2	
NEMATODA sp.							2	1			1	3		2	3	1	28	7	1		11	
Golfingia vulgaris vulgaris				1										1				1	1		2	
Phascolion strombus strombus									1													
Pisione remota																						
Polynoidae sp.								2	1				4		1		4	4				
Gattiana cirrhosa							1															
Harmothoe sp.											2			4						4	1	
Malmgreniella castanea																						
Harmothoe abyssicola																						
Harmothoe extenuata												1						1			2	
Harmothoe fragilis					1		1	2				1										
Harmothoe fraserthomsoni																						
Harmothoe impar				1	1		1	1		5	7		2	1		1	3				11	
Harmothoe pagenstecheri																					2	
Lepidonotus squamatus		1			1	1		2		1	1		2	2	3	1	2				6	4
Pholoe inornata										1			2	3	1		1				3	
Pholoe baltica		1	1		2	6		2					3		1	3	6	2	1	4	4	
Sthenelais boa																						
Eteone longa agg.				1					1	1	3		2	2				1			2	
Eteone foliosa											1	1	1	1								
Eulalia expusilla																						
Eumida sanguinea		1	1		1								1		1							1
Glycera alba					1	2																
Glycera lapidum agg.	1		1	1	3	1	1		1		3	1	1			1	2	1	2	2	3	
Glycera oxycephala																						
Glycinde nordmanni						1																
Goniada maculata																						
Sphaerodorum gracilis																						1
Kefersteinia cirrata																						
Nereimyra punctata																						1
Syllidia armata																						
Syllidae epitoke																						
Syllis columbretensis											2		5	4			1	1				
Syllis garciai												1		2			1		1			2
Syllis armillaris										4		1			2	1	3					1
Syllis variegata																						
Eusyllis blomstrandii							1					1			1		1					1
Syllides sp.																						
Exogone dispar						1				1		1										
Exogone hebes																						
Exogone verugera					5	1																
Sphaerosyllis taylora				1			1			2	3	3	3		1		1					6
Autolytus sp.			1													1	1					
Eunereis longissima										2			4	3								
Nephtys juv.						2									3							
Nephtys caeca						1	1		1	2							1					
Nephtys cirrosa				1																		
Nephtys kersivalensis																						
Nephtys pente																						
Lumbrineridae sp. Fragments											P											
Lumbrineris cingulata			1	2	4	1				1		1		3	1					2	1	
Protodorvillea kefersteini		2			2						8	6	1	5			1			1	1	
Scoloplos armiger						1		1				1										
Paradoneis lyra			1		5																	
Poecilochaetus serpens					1																	
Aonides oxycephala													1				1	2				2
Aonides paucibranchiata				1			1		2		1		4	1	1		3		5	2	2	
Laonice sp. juv.			1				1															
Laonice bahusiensis								1	1		3		2	1	1						1	
Polydora caeca										1		1										
Polydora caulleryi						2				1											1	
Prionospio sp.				1				1									1					
Pseudopolydora pulchra										1												
Spio armata agg.	1		1		1		1				3	1	2	2	4		21	3	1	4	3	
Spiophanes bombyx																						
Spiophanes kroyeri				1	2	3																
Aphelochaeta sp. 'A'																						
Aphelochaeta marioni										1												
Caulleriella alata			1				1	2		2	1			1			1				2	1
Caulleriella zetlandica				2	4	1	1															
Cirriiformia sp. juv.																						
Cirriiformia tentaculata		1	1							1	3	2	3	4								
Caulleriella killariensis													1	1								
Capitella sp.														1								

	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C	13A	13B	13C	14	15	16
Mediomastus fragilis				2	2	22	7	1	2	6		6	6	17			1	2	2	8	1
Notomastus sp.										2			2	3	1						
Maldanidae sp.																					
Clymenura sp.				2		4			1						2			3		1	1
Microclymene tricirrata					2	1															
Clymenura johnstoni																					
Praxillella affinis					2																
Ophelia borealis																					
Scalibregma celticum										3		2	3				1			9	2
Scalibregma inflatum						1		1		1	2	1	1	3						2	
Galatowenia oculata				2		5	1	1													
Owenia fusiformis				1																	
Lagis koreni																					
Sabellaria spinulosa	11	7	6		2	1				26	29	53	23	32	36			1			
Melinna elisabethae					1	23			7	4	4	12	8	8	1					3	1
Ampharetinae sp. juv.				2	1	16				3											
Ampharete lindstroemi				1																	
Anobothrus gracilis					2	1															
Terebellides stroemi													2	1							1
Trichobranthus glacialis													1								
Terebellidae sp. juv.											4	5									
Eupolymnia nesidensis									2					1		1					
Lanice conchilega						1							3								
Amphitrite sp.																					
Pista sp.						1															1
Polycirrus sp.	1	2	1		2			1				2		4	1			4	2	1	2
Thelepus setosus																		1			
Sabellidae sp.						1															
Chone sp.				5	11	12	2		13											17	
Euchone rubrocincta					1	4			1												
Jasmineira caudata						1			1												
Pseudopotamilla reniformis															1						
Sabella pavonina																					
Hydroides norvegica					1	6	1	3													
Spirobranchus sp.					2							2									
Spirobranchus lamarcki						1				2	12	5	2	2	4						
Spirobranchus triqueter				2	2	4	7	5	3											1	1
Limnodriloides sp.																					
Nymphon brevistre						1												1			1
Achelia echinata					2	2		3	4	4	3	1	4	1	4	6	10	8		20	3
Endeis spinosa																1				1	
Callipallene brevirostris				1							1		1				3	1		8	2
Nebalia bipes																					
Eusirus longipes				1																	
Gammarellus homari																					
Pericorolodes longimanus																					
Amphilochus manudens													1								
Urothoe elegans				2	6	2															
Harpinia antennaria										2	1										
Metaphoxus fultoni																					
Orchomene humilis		1											1		2		1			1	
Orchomenella nana					1			1		1			2								
Tmetonyx cicada																					
Tmetonyx similis				1																	
Iphimedia sp.								1									1				
Nototropis swammerdamei		1		1	3																
Ampelisca diadema				7						1											
Ampelisca spinipes					2	2		1	1					1							
Cheirocratus sp. female					1	1	2	2			4	1	1	1			1	3		3	
Cheirocratus assimilis																					
Cheirocratus intermedius						1	2				1								1	2	
Othomaera othonis			1	1									1		1			1			
Gammaropsis maculata								1	1												
Leptocheirus hirsutimanus								1													
Crassikorophium bonellii												1									
Crassikorophium crassicorne																					
Unciola crenatipalma	3																				
Dyopodos porrectus								2											1		
Pseudoprotella phasma							1														
Gnathia juv. & females												1					1			1	
Gnathia dentata						2					1									2	
Janira maculosa													2	1	2					2	
Munna minuta								1										1		1	
Pleurogonium rubicundum																				1	
Tanaopsis graciloides																					
Bodotria scorpioides																					
Thoralus cranchii			1				1			1	1	1		1		2	6	2		1	

	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C	13A	13B	13C	14	15	16
Pandalina brevirostris				1																	
Pandalus montagui																1					
Anapagurus hyndmanni								3									1				
Pagurus bernhardus																					
Galathea intermedia					2	1	5	6		1		1	3			1	4			3	5
Pisidia longicornis					1		16	74	3	20	50	3	48	34	8	15	16	10	1	57	7
Ebalia sp. juv.																					
Ebalia tuberosa					1	1	2														2
Ebalia tumefacta																					
Majidae sp. juv.																	1			1	
Inachus sp.																	1				
Macropodia sp. juv.												1									
Macropodia linaresi													1								
Eurynome aspersa																					
Cancer pagurus																					
Liocarcinus pusillus						1															
Pilumnus hirtellus															1						
Leptochiton asellus					7	7	4	4	2					2	3			2		8	5
Gastropoda sp.																					
Gibbula tumida				1			2	3		1	6	2	5	2	6	1	1	2		4	3
Gibbula cineraria													2			3				2	
Calliostoma zizyphinum																					
Rissoa parva							2	1		4	24	19	5			6	10	1		7	
Alvania punctura								1													1
Manzonina crassa										3	5	1			3	2	1			2	
Onoba semicostata						1	2	12		5	6		9		8	6	9	4		7	4
Crepidula fornicata										1			1								
Trivia arctica																					
Euspira pulchella									1												
Vitreolina philippi																					
Boreotrophon truncatus																					1
Ocenebra erinaceus																					
Hinia incrassata							4	14													
Oenopota rufa										1											
Odosstomia turrita											1				1						
Brachystomia scalaris																					
Nudibranchia sp.								1													
Goniodoris sp.									1												1
Onchidorididae sp.					4			2								1					
Onchidoris muricata				1		1															1
Bivalvia sp. # siphon					P																
Nucula nucleus				2		2	2			20	4	5	3	4		1				3	1
Nuculana minuta				1		1	2			1	1		3	1		1				1	
Mytilus edulis juv.											1										
Modiolus juv.																1	1				
Modiolarca tumida								1													
Musculus discors juv.								1			2		1				19			3	
Palliolium tigrinum																					
Anomiidae sp. juv.																					
Anomia ephippium								1													
Lucinoma borealis																					
Hemilepton nitidum						1															1
Kurtiella bidentata													1			2	1	1			1
Goodallia triangularis																				1	1
Astarte montagui																					
Parvicardium ovale				2		4		1								1					1
Parvicardium scabrum																					
Spisula sp. juv.																					
Spisula elliptica																					
Ensis sp. damaged						P															
Gari tellinella																					1
Abra alba					2	1	2			1	2	1	10	7	2						
Clausinella fasciata																					1
Timoclea ovata				2		6	2	1	1												
Tapes rhomboides															1						
Dosinia exoleta						3															
Mya sp. juv.										1					1		1				1
Mya arenaria						2								1							1
Hiatella arctica										1				1	1			3			
Phoronis sp.						1					1	1			3						2
Asterioidea sp. juv.																					
Crossaster papposus juv.																					1
Henricia sp. juv.																					
Henricia oculata																					
Asterias rubens										1											
Ophiothrix sp. juv.						1				3					3						
Ophiothrix fragilis													1				2	1			13



	8A	8B	8C	9A	9B	9C	10A	10B	10C	11A	11B	11C	12A	12B	12C	13A	13B	13C	14	15	16	
Ophiactis balli																						
Ophiopholis aculeata										1			1				1					18
Amphiuridae juv.	1									2							1					
Amphipholis squamata			1	1		2	4	4	1	3	4	1	5	2	7	3	9		2	10	1	
Ophiuridae juv.						2																4
Ophiura albida				1																		
Echinocyamus pusillus								1														
Thyone fusus													1									
Porifera sp.								P														
Leucosolenia sp.																						
Sycon ciliatum								P														
Cliona sp.						P																
Tubularia sp.				P																		
Halecium sp.				P		P	P									P						
Hydrallmania falcata											P	P										
Sertularia sp.					P		P				P		P			P						
Plumulariidae sp.																		P		P	P	
Nemertesia sp.																						
Nemertesia ramosa																						
Campanulariidae sp.																P	P					
Alcyonium digitatum				P																		
ACTINIARIA sp.																						
Filogranae sp.																						
Filograna implexa																						
Salmacina dysteri													P									
Cirripedia sp.								P									P					
Verruca stroemi					P		P	P	P	P		P			P	P	P	P		P	P	
Balanus sp. juv.																						
Balanus crenatus														P		P	P	P		P	P	
Crisidia cornuta					P		P	P	P		P	P						P		P	P	
Crisia sp.					P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
Tubulipora sp.				P			P		P		P							P		P	P	
Alcyonidium diaphanum	P	P									P		P				P	P		P	P	P
Vesicularia spinosa	P			P							P											
Amathia lendigera	P	P	P			P		P	P	P	P	P	P	P		P	P		P			
Conopeum reticulatum																						
Electra pilosa											P											
Flustra foliacea							P	P			P		P		P		P				P	
Securiflustra securifrons								P	P													
Callopora sp.									P		P						P					P
Callopora rylandi																						
Amphiblestrum auritum							P			P		P	P	P	P							
Bugula flabellata					P	P	P		P													
Bicellariella ciliata					P	P	P				P						P					
Scrupocellaria scruposa			P		P	P	P	P	P	P	P	P	P	P	P	P	P	P		P	P	
Cellaria sp.					P																	
Chorizopora brongniartii												P										
Escharoides coccinea											P	P			P							
Escharella immersa								P	P		P	P	P	P		P	P	P		P	P	
Escharella ventricosa				P			P			P												P
Phaeostachys spinifera											P	P				P	P	P				
Parasmittina trispinosa				P	P																P	P
Schizomavella sp.				P	P	P		P			P		P				P	P		P	P	
Microporella ciliata				P			P		P							P	P	P				P
Cellepora pumicosa				P							P											P
Turbicellepora avicularis					P							P									P	P
Didemniidae sp.					P		P			P												
Dendrodoa grossularia			2			P		P		P	P	P	P	P	P		P			P	P	
Molgula sp.											P	P	P									
Corallinaceae sp.																						
Plocamium cartilagineum			P	P																		

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31A	31B	31C	32A	32B	32C
Edwardsiidae sp.		1																		
TURBELLARIA sp.																				
NEMERTEA sp.	1		4		1	3	1	1	4			2	1							3
NEMATODA sp.	7	5			2		2		2		1	1					2	4	5	7
Golfingia vulgaris vulgaris	1	1			2		3													
Phascolion strombus strombus																				
Pisione remota																				
Polynoidae sp.									1					1				2		
Gattyana cirrhosa							2													
Harmothoe sp.			8					2											1	
Malmgreniella castanea																				
Harmothoe abyssicola											3									
Harmothoe extenuata												1								
Harmothoe fragilis			1								1									
Harmothoe fraserthomsoni																				
Harmothoe impar	3	4	8	3		1	1	2	1			4	1							1
Harmothoe pagenstecheri																				
Lepidonotus squamatus	2	1	5	1	1			3	1		5	3				1	2	2	1	3
Pholoe inornata					1							1								
Pholoe baltica		5			3	2		3	2		3	4	1	1						2
Sthenelais boa																				
Eteone longa agg.		1	3		1	1					3			1				1		
Eteone foliosa																				
Eulalia expusilla																				
Eumida sanguinea		1		1								2			1			1		1
Glycera alba																				
Glycera lapidum agg.	3	1	1			2		1	3	4	2	3	2	1				1	1	1
Glycera oxycephala							1													
Glycine nordmanni								1												
Goniada maculata			1																	
Sphaerodorum gracilis																				
Kefersteinia cirrata											1									
Nereimyra punctata																				
Syllidia armata																				
Syllidae epitoke												1								
Syllis columbretensis		2	4		1	3			1		2	3								1
Syllis garciai			3				1													
Syllis armillaris					1		1											1		
Syllis variegata																				
Eusyllis blomstrandii																				1
Syllides sp.												1								
Exogone dispar						2													2	
Exogone hebes																		1		
Exogone verugera																		1		1
Sphaerosyllis taylori													1							1
Autolytus sp.												1								1
Eunereis longissima					2															
Nephtys juv.		1	1																	
Nephtys caeca					1															
Nephtys cirrosa																				
Nephtys kersivalensis																				
Nephtys pente																				
Lumbrineridae sp. Fragments																				
Lumbrineris cingulata											1									
Protodorvillea kefersteini		1			7							1								4
Scoloplos armiger			1						1											
Paradoneis lyra			1								1	2								
Poecilochaetus serpens																				
Aonides oxycephala						4			3		3	1								
Aonides paucibranchiata	1	1										2							1	
Laonice sp. juv.																				
Laonice bahusiensis																				
Polydora caeca								1										1		
Polydora caulleryi	1																			
Prionospio sp.																				
Pseudopolydora pulchra																				
Spio armata agg.	4	3	6		4	13		8	2			3	1	1	2	1		1	2	4
Spiophanes bombyx							1													
Spiophanes kroyeri																				
Aphelochaeta sp. 'A'																				1
Aphelochaeta marioni			1																	
Caulleriella alata			6					1	1		1	2								
Caulleriella zetlandica																				
Cirriformia sp. juv.																				
Cirriformia tentaculata					2															
Cauleriella killariensis											1									
Capitella sp.																				

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31A	31B	31C	32A	32B	32C
Mediomastus fragilis	1		3		1	3		2	3		4	1		1						
Notomastus sp.		1																		
Maldanidae sp.	P																			
Clymenura sp.												2								
Microclymene tricirrata																				
Clymenura johnstoni			1																	
Praxillella affinis																				
Ophelia borealis													1							
Scalibregma celticum		1	1		2				1		6	1			1					
Scalibregma inflatum			1					1			1	1								
Galathowenia oculata																				
Owenia fusiformis			1																	
Lagis koreni												1								
Sabellaria spinulosa		1	4		23	4	38					5	1		10	24	11	69	10	16
Melinna elisabethae			1					4												
Ampharetinae sp. juv.								1												
Ampharete lindstroemi																				
Anobothrus gracilis			1																	
Terebellides stroemi																				
Trichobranchus glacialis																				
Terebellidae sp. juv.					1														2	
Eupolymnia nesidensis																				
Lanice conchilega																				
Amphitrite sp.															1					
Pista sp.																				
Polycirrus sp.	1	4					3	1		1		1	2	3	1		2	1		6
Thelepus setosus							2	1										1		
Sabellidae sp.																				
Chone sp.																				
Euchone rubrocincta																				
Jasmineira caudata																				
Pseudopotamilla reniformis												2						1		
Sabella pavonina																				
Hydroides norvegica			1					1	1											
Spirobranchus sp.																				
Spirobranchus lamarcki																				
Spirobranchus triqueter												1								
Limnodriloides sp.																				
Nymphon brevirostre											1									
Achelia echinata	6	3	9	2	1	1	1	3	2		1	23		1					3	
Endeis spinosa																				
Callipallene brevirostris			1	3		1						7								
Nebalia bipes																				
Eusirus longipes											1									
Gammarellus homari										1										
Periculodes longimanus																				
Amphilochus manudens																				
Urothoe elegans																				
Harpinia antennaria																				
Metaphoxus fultoni																				
Orchomene humilis		2	8	1	3	3			1						7		1		3	
Orchomenella nana											2									
Tmetonyx cicada		1																		
Tmetonyx similis	1																			
Iphimedia sp.												1								
Nototropis swammerdamei							1											1		
Ampelisca diadema																				
Ampelisca spinipes					1															
Cheirocratus sp. female	1		1					2				1		1						
Cheirocratus assimilis											1									
Cheirocratus intermedius	2		1																	
Othomaera othonis			1	1							1	1			1					
Gammaropsis maculata																				
Leptocheirus hirsutimanus																				
Crassicorophium bonellii																				
Crassicorophium crassicornae					1															
Unciola crenatipalma															5	1	1	6		
Dyopededos porrectus																				
Pseudoprotella phasma																				
Gnathia juv. & females																				
Gnathia dentata							1	1	1		1	1					1			
Janira maculosa	1		2					1							2		1	1		
Munna minuta				1								1								1
Pleurogonium rubicundum																				
Tanaopsis graciloides																				
Bodotria scorioides			1																	1
Thoralus cranchii		1						1	1		10			3						



	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31A	31B	31C	32A	32B	32C
Pandalina brevirostris																				
Pandalus montagui																				
Anapagurus hyndmanni																				
Pagurus bernhardus		1																		
Galathea intermedia	6	7	3	2				2	2			22	4	1			1	1		
Pisidia longicornis	4	11	207	4		4		8	12			55	56		1		1			
Ebalia sp. juv.																				
Ebalia tuberosa											2									
Ebalia tumefacta																				
Majidae sp. juv.																				
Inachus sp.																				
Macropodia sp. juv.																				
Macropodia linaresi																				
Eurynome aspersa																				
Cancer pagurus																				
Liocarcinus pusillus								2												
Pilumnus hirtellus																				
Leptochiton asellus	4	3	5	1	5	1		1		1	3	9				1		1		
Gastropoda sp.															1					
Gibbula tumida	2		5		2	3		3	1		4	6								
Gibbula cineraria			10		2															
Calliostoma zizyphinum			1									1								
Rissoa parva				4		1	1	1				1								
Alvania punctura																				
Manzonina crassa			1			2														
Onoba semicostata			7	2		19		3	5		2	4							1	
Crepidula fornicata																				
Trivia arctica									1											
Euspira pulchella					1															1
Vitreolina philippi																				
Boreotrophon truncatus																				
Ocenebra erinaceus	1	1										1				1				1
Hinia incrassata			4									1								
Oenopota rufa																				
Odostomia turrita																				
Brachystomia scalaris																				
Nudibranchia sp.																				1
Goniodoris sp.																				
Onchidorididae sp.			1									2								
Onchidoris muricata									1			2								
Bivalvia sp. # siphon																				
Nucula nucleus			3	1		6		2			3	3					1			
Nuculana minuta			4					1			1	2								
Mytilus edulis juv.			4			2														
Modiolus juv.	1																			
Modiolarca tumida		1																		
Musculus discors juv.			1	2				1				2								1
Palliolium tigrinum																				
Anomiidae sp. juv.								1				2								
Anomia ehippium																				
Lucinoma borealis																				
Hemilepton nitidum			2						1		1		1					1		
Kurtiella bidentata									2		1	2								
Goodallia triangularis																				
Astarte montagui																				
Parvicardium ovale								1				3								
Parvicardium scabrum																				
Spisula sp. juv.																				1
Spisula elliptica	1													2						1
Ensis sp. damaged																				
Gari tellinella			1	1					1											
Abra alba			4					3	2		7	1				1				
Clausinella fasciata																				
Timoclea ovata								1												
Tapes rhomboides						1								1						
Dosinia exoleta																				
Mya sp. juv.			1									2								1
Mya arenaria		1	1		1							2								
Hiatella arctica	1	2	2					8	1		6	9					1	2	2	1
Phoronis sp.			7			1		2	3			1		1						
Asteroidea sp. juv.			1																	
Crossaster papposus juv.														1						
Henricia sp. juv.											1									
Henricia oculata																				
Asterias rubens																				
Ophiothrix sp. juv.																				
Ophiothrix fragilis		2										1					1	1		

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31A	31B	31C	32A	32B	32C
Ophiactis balli																				
Ophiopholis aculeata	10	1	1		1			1				1								
Amphiuridae juv.												2								
Amphipholis squamata	2	6	13		1	2	1	3	6		7	9			4		1	2	1	3
Ophiuridae juv.			1									1								
Ophiura albida														1						
Echinocyamus pusillus																				
Thyone fusus																				
Porifera sp.																				
Leucosolenia sp.																				
Sycon ciliatum																				
Cliona sp.																				
Tubularia sp.												p								
Halecium sp.																				
Hydrallmania falcata		p					p						p					p	p	p
Sertularia sp.	p	p	p				p			p		p						p		
Plumulariidae sp.				p									p							
Nemertea sp.																				
Nemertea ramosa																				p
Campanulariidae sp.																				
Alcyonium digitatum																				
ACTINARIA sp.																				
Filigraninae sp.																				
Filograna implexa																				
Salmacina dysteri																				
Cirripedia sp.							p													
Verruca stroemi			p			p		p	p		p	p								p
Balanus sp. juv.																				
Balanus crenatus			p	p	p	p			p		p	p		p		p		p	p	p
Crisidia cornuta	p			p	p			p	p		p	p								
Crisia sp.	p	p	p	p			p	p	p	p	p	p		p			p	p		p
Tubulipora sp.						p		p	p	p	p			p					p	
Alcyonium diaphanum	p	p	p	p	p		p	p				p	p	p	p			p	p	p
Vesicularia spinosa	p						p		p		p									
Amathia lendigera	p	p	p			p		p	p		p	p	p		p		p			
Conopeum reticulum					p															
Electra pilosa			p		p		p			p		p	p	p	p	p		p	p	p
Flustra foliacea		p	p	p	p				p		p	p					p			
Securiflustra securifrons																				
Callopora sp.								p	p		p	p		p						
Callopora rylandi																				
Amphiblestrum auritum					p	p	p			p								p		p
Bugula flabellata																				
Bicellariella ciliata				p	p			p						p					p	p
Scrupocellaria scruposa	p	p	p	p	p		p	p	p	p	p	p	p	p	p		p	p		
Cellaria sp.									p		p									
Chorizopora bronngiartii																				
Escharoides coccinea									p		p									
Escharella immersa					p	p	p	p	p		p	p		p				p		
Escharella ventricosa			p	p			p			p									p	p
Phaeostachys spinifera											p			p					p	
Parasmittina trispinosa																				
Schizomavella sp.			p			p	p	p	p	p	p							p	p	p
Microporella ciliata			p																	
Cellepora pumicosa	p		p								p	p								
Turbicellepora avicularis									p					p	p					
Didemniidae sp.	p	p																		
Dendrodoa grossularia		2	p	p	p	p	p	p		p	p	p		p		p		p	p	p
Molgula sp.												p							p	
Corallinaceae sp.						p	p													
Plocamium cartilagineum												p						p		

	35A	35B	35C	36A	36B	36C	37A	37B	37C	38	39	40	41	42
Edwardsiidae sp.														
TURBELLARIA sp.														
NEMERTEA sp.			6	2		1			5	2	1	5		1
NEMATODA sp.					2		2		3	6		6	5	
Golfingia vulgaris vulgaris												1		
Phascolion strombus strombus										1				
Pisione remota										1				
Polynoidae sp.				5								1	1	
Gattyna cirrhosa			1		1			1	3					
Harmothoe sp.	1	3			8	3	2	5	5					
Malmgreniella castanea		1												
Harmothoe abyssicola								2						
Harmothoe extenuata		2			1	2			1					1
Harmothoe fragilis														
Harmothoe fraserthomsoni														
Harmothoe impar	5	4	10		2	8	4	3	10		1	1	1	
Harmothoe pagenstecheri														
Lepidonotus squamatus	2	9	4	2	4	2		8	3			1	1	
Pholoe inornata	2				1	3	2	1						
Pholoe baltica		3		2	3	3	1		2			1		
Sthenelais boa					1									
Eteone longa agg.	1		1		1	1		2	2		1			
Eteone foliosa														
Eulalia expusilla												1		
Eumida sanguinea			4		4	1			4		1	1		
Glycera alba					1									
Glycera lapidum agg.									3	3	2			1
Glycera oxycephala														
Glycinde nordmanni						1								
Goniada maculata														
Sphaerodorum gracilis									1					
Kefersteinia cirrata													1	
Nereimyra punctata									1					
Syllidia armata				1										
Syllidae epitoke														
Syllis columbretensis	2	5	7	1	1	1	3		6		2	1		
Syllis garciai			1											
Syllis armillaris	2	5	7		1	1			6		9	1	1	
Syllis variegata														
Eusyllis blomstrandii		1												1
Syllides sp.														
Exogone dispar														
Exogone hebes														
Exogone verugera														
Sphaerosyllis taylori										2				
Autolytus sp.					1									
Eunereis longissima	P													
Nephtys juv.	2	1			1			1						
Nephtys caeca						1								
Nephtys cirrosa														
Nephtys kersivalensis									1					
Nephtys pente														
Lumbrineridae sp. Fragments					P			P						
Lumbrineris cingulata		2	1						3					
Protodorvillea kefersteini					1		1	1	1			2		
Scoloplos armiger														
Paradoneis lyra			1	2		1								
Poecilochaetus serpens														
Aonides oxycephala		1	4	1	1		1							1
Aonides paucibranchiata									3					1
Laonice sp. juv.							1							
Laonice bahusiensis														
Polydora caeca														
Polydora caulleryi										2				
Prionospio sp.														
Pseudopolydora pulchra														
Spio armata agg.	6	9	4	1	1				5			6	4	
Spiophanes bombyx														
Spiophanes kroyeri														
Aphelochaeta sp. 'A'						1							1	
Aphelochaeta marioni									1					
Caulleriella alata	2	3	3	1	4	2		1	6					
Caulleriella zetlandica								1						
Cirriformia sp. juv.														
Cirriformia tentaculata														
Caulleriella killariensis														
Capitella sp.	1	1												



	35A	35B	35C	36A	36B	36C	37A	37B	37C	38	39	40	41	42
Mediomastus fragilis	5	3	17	3	25	28	2	11	20					
Notomastus sp.														
Maldanidae sp.													p	
Clymenura sp.					1							3		
Microclymene tricirrata														
Clymenura johnstoni														
Praxillella affinis	1													
Ophelia borealis														
Scalibregma celticum		2	2			2		5	3				1	
Scalibregma inflatum	1		3		1				2					
Galathowenia oculata														
Owenia fusiformis				1		1								
Lagis koreni														
Sabellaria spinulosa	2	3	9	3	5	3	11	4	6	1			1	
Melinna elisabethae	4		12	1	4	3	3	6	4					
Ampharetinae sp. juv.									1					
Ampharete lindstroemi														
Anobothrus gracilis						1								
Terebellides stroemi														
Trichobranchus glacialis														
Terebellidae sp. juv.	2			1			1		1					
Eupolymnia nesidensis		1			3				2					
Lanice conchilega														
Amphitrite sp.														
Pista sp.														
Polycirrus sp.		1	1	2				3	2	1		3		
Thelepus setosus		1												
Sabellidae sp.														
Chone sp.										1				
Euchone rubrocincta														
Jasmineira caudata														
Pseudopotamilla reniformis									1					
Sabella pavonina							1							
Hydroides norvegica					2									
Spirobranchus sp.														
Spirobranchus lamarcki						1					1			
Spirobranchus triqueter									1	1				
Limnodriloides sp.						4			3					
Nymphon brevirostre					2	1								
Achelia echinata		3	4	3	24	13	6	13	12				1	
Endeis spinosa														
Callipallene brevirostris				2	5	3	1	3	8				1	
Nebalia bipes								1						
Eusirus longipes														
Gammarellus homari														
Periculodes longimanus	1													
Amphilochus manudens					1									
Urothoe elegans														
Harpinia antennaria	1	1												
Metaphoxus fultoni									1					
Orchomene humilis	4		3	1				1	10					
Orchomenella nana	1	1	1		1				4					
Tmetonyx cicada														
Tmetonyx similis														
Iphimedia sp.									1					
Nototropis swammerdamei	1													
Ampelisca diadema														
Ampelisca spinipes														
Cheirocratus sp. female	2	1	2	1	1	2			3					
Cheirocratus assimilis														
Cheirocratus intermedius	3	4	1		1				1					
Othomaera othonis					1	2								
Gammaropsis maculata		1			1									
Leptocheirus hirsutimanus														
Crassikorophium bonellii														
Crassikorophium crassicorne														
Unciola crenatipalma														
Dyopedes porrectus														
Pseudoprotella phasma														
Gnathia juv. & females		1	1		1									
Gnathia dentata	1		5	2	2				2					
Janira maculosa	1		1						4					
Munna minuta				1	3									
Pleurogonium rubicundum														
Tanaopsis graciloides									1					
Bodotria scorioides														
Thoralus cranchii	3	3	3	1	2	3		1	4					

	35A	35B	35C	36A	36B	36C	37A	37B	37C	38	39	40	41	42
Pandalina brevirostris														
Pandalus montagui														
Anapagurus hyndmanni														
Pagurus bernhardus														
Galathea intermedia	3	1	8	6	5	4	1	2	1		1	1	1	
Pisidia longicornis	13	24	33	37	72	38	32	31	104		3		2	
Ebalia sp. juv.														
Ebalia tuberosa					1	1	2		1					
Ebalia tumefacta														
Majidae sp. juv.		1												
Inachus sp.														
Macropodia sp. juv.									1					
Macropodia linaresi														
Eurynome aspersa						1								
Cancer pagurus		1												
Liocarcinus pusillus														
Pilumnus hirtellus		1												
Leptochiton asellus		1	3	2	6	3	5	3	6			2	2	
Gastropoda sp.														
Gibbula tumida	1	1	1		4	4	5		3	1	2	4	3	
Gibbula cineraria		1						2						
Calliostoma zizyphinum			1											
Rissoa parva	3	5	2			1	3		4					4
Alvania punctura		1			1	4								
Manzonina crassa	7	3	2		3		1	1	3					
Onoba semicostata	29	14	19	9	21	14	5	6	11			1	1	
Crepidula fornicata			1											1
Trivia arctica														
Euspira pulchella														
Vitreolina philippi														
Boreotrophon truncatus							1	2	5					
Ocenebra erinaceus									1		1			
Hinia incrassata					2	1	1	1	2					1
Oenopota rufa														
Odostomia turrita														
Brachystomia scalaris														
Nudibranchia sp.									2					
Goniodoris sp.		12							2					
Onchidorididae sp.				1		1								
Onchidoris muricata														
Bivalvia sp. # siphon				P			P							
Nucula nucleus	28	14	21	4	4	2	1	8	4					
Nuculana minuta	7	8	2	1	3	1		4	5					
Mytilus edulis juv.					3					1				
Modiolus juv.					2		2	3					1	
Modiolarca tumida					1	1	1							
Musculus discors juv.		2	1	1	9	5	1	1	6					1
Palliolium tigrinum					1									
Anomiidae sp. juv.						1								
Anomia ephippium								2						
Lucinoma borealis			1											
Hemilepton nitidum				4	3	1	1	2	2					
Kurtiella bidentata		4			1		1		1					
Goodallia triangularis														
Astarte montagui														1
Parvicardium ovale					1		2	4	1					
Parvicardium scabrum						1								
Spisula sp. juv.														
Spisula elliptica										1				
Ensis sp. damaged														
Gari tellinella														
Abra alba	4		3	9	2	4	1	1	4					
Clausinella fasciata								1						1
Timoclea ovata								3	2					
Tapes rhomboides														
Dosinia exoleta														
Mya sp. juv.			1		2	1		1						
Mya arenaria						1			1					
Hiatella arctica			7	3	22	5	7	4	7			1	1	1
Phoronis sp.							1							
Asteroidea sp. juv.					1									
Crossaster papposus juv.			1											
Henricia sp. juv.			1		1									
Henricia oculata	1								1					
Asterias rubens														
Ophiothrix sp. juv.														
Ophiothrix fragilis						3							1	1

	35A	35B	35C	36A	36B	36C	37A	37B	37C	38	39	40	41	42
Ophiactis balli						1	1							
Ophiopholis aculeata		5			3							7		
Amphiuridae juv.						1					1			
Amphipholis squamata	10	15	8	5	7	8	11	13	16	6		1	3	
Ophiuridae juv.														
Ophiura albida														
Echinocyamus pusillus														
Thyone fusus						1								
Porifera sp.			P		P									
Leucosolenia sp.						P								
Sycon ciliatum														
Cliona sp.														
Tubularia sp.									P					
Halecium sp.			P											
Hydrallmania falcata														
Sertularia sp.					P		P		P		P	P		P
Plumulariidae sp.				P										
Nemertea sp.														
Nemertea ramosa														
Campanulariidae sp.						P								
Alcyonium digitatum														
ACTINARIA sp.									P					
Filigraninae sp.														
Filograna implexa			P											
Salmacina dysteri														
Cirripedia sp.			P											
Verruca stroemi	P	P	P	P	P	P	P	P	P	P		P	P	P
Balanus sp. juv.														
Balanus crenatus			P	P	P	P	P	P	P		P		P	P
Crisidia cornuta	P		P	P	P	P	P	P	P		P		P	P
Crisia sp.	P		P	P	P	P	P	P	P	P			P	P
Tubulipora sp.		P		P	P	P	P	P				P	P	P
Alcyonium diaphanum	P			P	P		P	P		P	P		P	
Vesicularia spinosa									P					P
Amathia lendigera	P	P	P	P	P	P	P	P	P		P			P
Conopeum reticulum														
Electra pilosa								P				P		
Flustra foliacea		P			P	P							P	
Securiflustra securifrons														
Callopora sp.				P	P				P	P				
Callopora rylandi											P			
Amphiblestrum auritum		P	P						P			P		
Bugula flabellata														
Bicellariella ciliata		P				P	P						P	P
Scrupocellaria scruposa	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Cellaria sp.				P	P	P								
Chorizopora brongniartii														
Escharoides coccinea							P	P	P		P	P	P	
Escharella immersa		P	P	P	P	P	P	P	P	P	P	P	P	
Escharella ventricosa	P		P				P							P
Phaeostachys spinifera	P	P						P				P	P	P
Parasmittina trispinosa										P				
Schizomavella sp.	P	P	P	P	P	P	P	P	P		P	P		
Microporella ciliata												P		
Cellepora pumicosa							P	P	P			P		
Turbicellepora avicularis														
Didemnidae sp.														
Dendrodoa grossularia	P	P	P	P	P	P	P	P	P	P		P		P
Molgula sp.			P		P		P							
Corallinaceae sp.	P		P											P
Plocamium cartilagineum														



## Appendix 5 Particle Size Analysis Summary Data

SAMPLE	PARAMETER	1	2	3	4	5	6	7	8
SAMPLE TYPE		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Bimodal, Poorly Sorted	Polymodal, Poorly Sorted	Trimodal, Very Poorly Sorted	Polymodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Polymodal, Very Poorly Sorted
TEXTURAL GROUP		Gravel	Gravel	Gravel	Muddy Sandy Gravel	Sandy Gravel	Sandy Gravel	Muddy Sandy Gravel	Muddy Sandy Gravel
SEDIMENT NAME		Coarse Gravel	Coarse Gravel	Coarse Gravel	Medium Silty Sandy Medium Gravel	Sandy Very Fine Gravel	Sandy Coarse Gravel	Fine Silty Sandy Medium Gravel	Very Coarse Silty Sandy Medium Gravel
FOLK AND WARD METHOD (mm)	MEDIAN GRAIN SIZE (mm)	12333.72	16638.87	15911.87	6913.99	4016.45	7641.02	2744.18	5926.62
	MEAN GRAIN SIZE (mm)	9702.35	11980.23	10883.28	5806.99	5262.14	5508.81	1987.82	3525.73
	SORTING	3.38	2.78	3.17	3.84	4.05	5.59	8.75	6.81
	SKEWNESS	-0.38	-0.69	-0.65	-0.29	0.17	-0.32	-0.32	-0.40
	KURTOSIS	1.02	2.08	1.59	1.03	0.94	0.84	0.86	0.90
FOLK AND WARD METHOD (Phi - Ø)	MEDIAN GRAIN SIZE (Ø)	-3.62	-4.06	-3.99	-2.79	-2.01	-2.93	-1.46	-2.57
	MEAN GRAIN SIZE (Ø)	-3.28	-3.58	-3.44	-2.54	-2.40	-2.46	-0.99	-1.82
	SORTING	1.76	1.47	1.66	1.94	2.02	2.48	3.13	2.77
	SKEWNESS	0.38	0.69	0.65	0.29	-0.17	0.32	0.32	0.40
	KURTOSIS	1.02	2.08	1.59	1.03	0.94	0.84	0.86	0.90
FOLK AND WARD DESCRIPTION	MEAN:	Medium Gravel	Medium Gravel	Medium Gravel	Fine Gravel	Fine Gravel	Fine Gravel	Very Coarse Sand	Very Fine Gravel
	SORTING:	Poorly Sorted	Poorly Sorted	Poorly Sorted	Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted
	SKEWNESS:	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Fine Skewed	Coarse Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	KURTOSIS:	Mesokurtic	Very Leptokurtic	Very Leptokurtic	Mesokurtic	Mesokurtic	Platykurtic	Platykurtic	Mesokurtic
BULK GRAIN SIZE	% GRAVEL:	87.77	89.08	88.03	79.56	73.68	74.79	54.54	65.79
	% SAND:	10.93	10.23	10.96	18.19	26.27	23.38	38.15	30.40
	% MUD:	1.30	0.69	1.01	2.25	0.05	1.83	7.30	3.81
	% V COARSE GRAVEL:	9.91	0.00	0.00	0.00	13.25	13.15	0.00	9.47
	% COARSE GRAVEL:	31.58	54.53	49.79	22.57	8.44	18.06	14.69	16.31
	% MEDIUM GRAVEL:	20.12	23.60	23.07	23.55	10.18	17.90	15.36	18.56
	% FINE GRAVEL:	15.43	7.49	9.58	19.50	18.26	14.44	13.51	11.47
	% V FINE GRAVEL:	10.72	3.46	5.59	13.94	23.55	11.23	10.99	9.98
	% V COARSE SAND:	5.59	2.21	3.16	7.37	15.73	7.41	6.94	9.22
	% COARSE SAND:	2.28	3.06	2.08	4.98	6.92	5.34	7.32	5.52
	% MEDIUM SAND:	1.85	3.49	3.61	4.36	3.23	6.64	11.32	7.67
	% FINE SAND:	0.86	1.13	1.66	0.97	0.17	2.97	8.68	4.53
	% V FINE SAND:	0.35	0.34	0.45	0.51	0.21	1.02	3.88	3.47
	% V COARSE SILT:	0.26	0.23	0.31	0.45	0.05	0.42	1.28	1.21
	% COARSE SILT:	0.29	0.11	0.19	0.42	0.00	0.46	1.29	0.57
	% MEDIUM SILT:	0.33	0.15	0.21	0.56	0.00	0.43	1.68	0.75
	% FINE SILT:	0.27	0.13	0.19	0.51	0.00	0.33	1.74	0.70
% V FINE SILT:	0.13	0.07	0.10	0.27	0.00	0.18	1.09	0.46	
% CLAY:	0.02	0.01	0.01	0.04	0.00	0.02	0.23	0.12	
% LOI		1.33	1.12	1.07	2.10	1.01	1.26	1.12	1.16

SAMPLE	PARAMETER	9	10	11	12	13	14	15	16
SAMPLE TYPE		Bimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Polymodal, Very Poorly Sorted	Polymodal, Very Poorly Sorted	Bimodal, Poorly Sorted	Trimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted
TEXTURAL GROUP		Muddy Sandy Gravel	Sandy Gravel	Gravel	Sandy Gravel	Sandy Gravel	Sandy Gravel	Muddy Sandy Gravel	Muddy Sandy Gravel
SEDIMENT NAME		Fine Silty Sandy Medium Gravel	Sandy Very Fine Gravel	Very Coarse Gravel	Sandy Medium Gravel	Sandy Fine Gravel	Sandy Medium Gravel	Medium Silty Sandy Medium Gravel	Medium Silty Sandy Coarse Gravel
FOLK AND WARD METHOD (mm)	MEDIAN GRAIN SIZE (mm)	597.97	2281.86	20513.91	5266.18	4475.00	7910.88	4276.68	11933.43
	MEAN GRAIN SIZE (mm)	1074.16	2446.07	18816.26	3522.54	4391.40	5616.40	2242.81	6321.49
	SORTING	8.06	5.23	4.43	4.83	5.56	3.01	10.83	4.51
	SKEWNESS	0.21	0.02	-0.28	-0.38	-0.10	-0.46	-0.48	-0.58
	KURTOSIS	0.89	1.00	1.06	0.81	0.92	0.82	0.95	1.04
FOLK AND WARD METHOD (Phi - ϕ)	MEDIAN GRAIN SIZE (ϕ)	0.74	-1.19	-4.36	-2.40	-2.16	-2.98	-2.10	-3.58
	MEAN GRAIN SIZE (ϕ)	-0.10	-1.29	-4.23	-1.82	-2.13	-2.49	-1.17	-2.66
	SORTING	3.01	2.39	2.15	2.27	2.47	1.59	3.44	2.17
	SKEWNESS	-0.21	-0.02	0.28	0.38	0.10	0.46	0.48	0.58
	KURTOSIS	0.89	1.00	1.06	0.81	0.92	0.82	0.95	1.04
FOLK AND WARD DESCRIPTION	MEAN:	Very Coarse Sand	Very Fine Gravel	Coarse Gravel	Very Fine Gravel	Fine Gravel	Fine Gravel	Very Fine Gravel	Fine Gravel
	SORTING:	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted
	SKEWNESS:	Coarse Skewed	Symmetrical	Fine Skewed	Very Fine Skewed	Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	KURTOSIS:	Platykurtic	Mesokurtic	Mesokurtic	Platykurtic	Mesokurtic	Platykurtic	Mesokurtic	Mesokurtic
BULK GRAIN SIZE	% GRAVEL:	41.17	53.75	89.40	67.79	66.85	78.12	62.77	78.31
	% SAND:	51.16	44.48	9.92	30.01	30.23	21.14	25.97	19.13
	% MUD:	7.67	1.77	0.68	2.19	2.92	0.73	11.26	2.56
	% V COARSE GRAVEL:	0.00	0.00	29.38	0.00	10.84	0.00	0.00	8.99
	% COARSE GRAVEL:	8.09	15.43	28.37	17.21	11.71	12.39	17.85	27.73
	% MEDIUM GRAVEL:	14.44	9.97	18.62	24.27	13.15	37.26	19.43	22.64
	% FINE GRAVEL:	11.91	10.95	8.77	14.26	17.10	14.44	14.19	10.34
	% V FINE GRAVEL:	6.74	17.39	4.26	12.06	14.05	14.03	11.31	8.62
	% V COARSE SAND:	3.99	23.51	2.63	9.41	13.92	12.99	8.42	5.64
	% COARSE SAND:	8.18	4.25	2.51	6.95	6.74	5.59	2.48	6.63
	% MEDIUM SAND:	23.78	9.91	3.23	8.86	6.29	2.16	6.43	5.03
	% FINE SAND:	13.38	5.96	1.28	3.82	2.51	0.17	5.36	1.19
	% V FINE SAND:	1.82	0.86	0.27	0.96	0.76	0.24	3.28	0.63
	% V COARSE SILT:	1.34	0.55	0.17	0.60	0.56	0.15	1.89	0.47
	% COARSE SILT:	1.32	0.36	0.13	0.44	0.53	0.16	2.01	0.44
	% MEDIUM SILT:	1.79	0.37	0.16	0.47	0.70	0.19	2.84	0.66
	% FINE SILT:	1.92	0.34	0.14	0.42	0.69	0.15	2.72	0.62
% V FINE SILT:	1.10	0.15	0.07	0.23	0.38	0.05	1.50	0.32	
% CLAY:	0.20	0.01	0.01	0.03	0.06	0.04	0.30	0.05	
% LOI		1.63	1.03	1.58	1.09	1.41	1.17	1.12	1.73

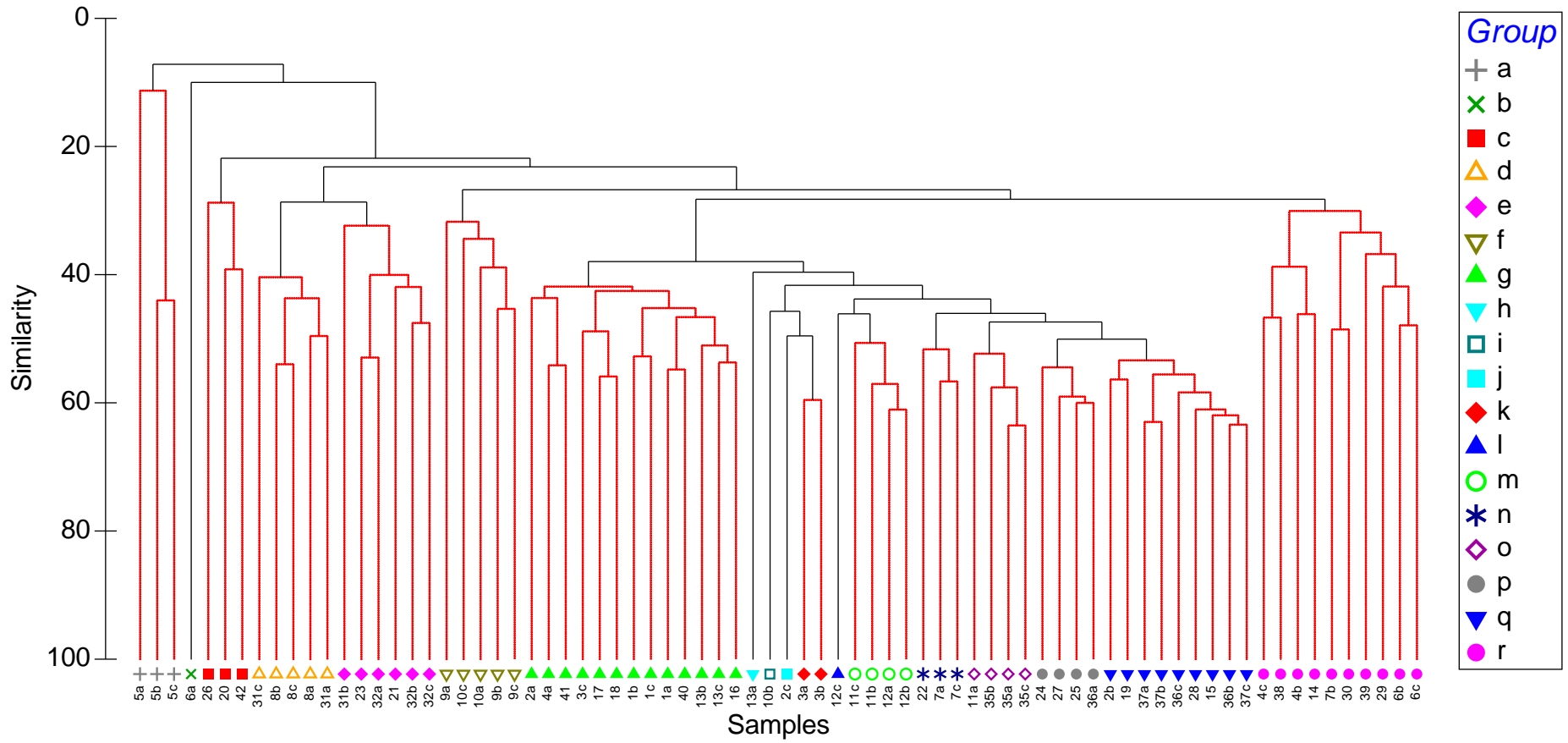
SAMPLE	PARAMETER	17	18	19	20	21	22	23	24
SAMPLE TYPE		Bimodal, Very Poorly Sorted	Polymodal, Very Poorly Sorted	Unimodal, Poorly Sorted	Polymodal, Very Poorly Sorted	Bimodal, Very Poorly Sorted	Polymodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted
TEXTURAL GROUP		Gravel	Sandy Gravel	Gravel	Gravel	Sandy Gravel	Sandy Gravel	Sandy Gravel	Sandy Gravel
SEDIMENT NAME		Very Coarse Gravel	Sandy Coarse Gravel	Coarse Gravel	Medium Gravel	Sandy Coarse Gravel	Sandy Very Coarse Gravel	Sandy Coarse Gravel	Sandy Coarse Gravel
FOLK AND WARD METHOD (mm)	MEDIAN GRAIN SIZE (mm)	21856.90	7495.11	16185.08	10903.79	10251.80	4334.23	17192.99	9095.33
	MEAN GRAIN SIZE (mm)	11811.42	4475.51	10755.26	8289.14	6176.66	3626.86	6900.98	3974.41
	SORTING	5.64	6.51	3.32	4.43	4.53	6.74	7.31	6.48
	SKEWNESS	-0.57	-0.38	-0.64	-0.32	-0.54	-0.13	-0.57	-0.58
	KURTOSIS	0.83	0.74	1.68	1.32	1.09	0.57	0.56	0.61
FOLK AND WARD METHOD (Phi - $\phi$ )	MEDIAN GRAIN SIZE ( $\phi$ )	-4.45	-2.91	-4.02	-3.45	-3.36	-2.12	-4.10	-3.19
	MEAN GRAIN SIZE ( $\phi$ )	-3.56	-2.16	-3.43	-3.05	-2.63	-1.86	-2.79	-1.99
	SORTING	2.50	2.70	1.73	2.15	2.18	2.75	2.87	2.70
	SKEWNESS	0.57	0.38	0.64	0.32	0.54	0.13	0.57	0.58
	KURTOSIS	0.83	0.74	1.68	1.32	1.09	0.57	0.56	0.61
FOLK AND WARD DESCRIPTION	MEAN:	Medium Gravel	Fine Gravel	Medium Gravel	Medium Gravel	Fine Gravel	Very Fine Gravel	Fine Gravel	Very Fine Gravel
	SORTING:	Very Poorly Sorted	Very Poorly Sorted	Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted
	SKEWNESS:	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Fine Skewed	Very Fine Skewed	Very Fine Skewed
	KURTOSIS:	Platykurtic	Platykurtic	Very Leptokurtic	Leptokurtic	Mesokurtic	Very Platykurtic	Very Platykurtic	Very Platykurtic
BULK GRAIN SIZE	% GRAVEL:	80.48	69.06	88.03	83.15	79.37	57.29	65.26	64.55
	% SAND:	17.80	28.77	10.75	16.31	18.68	42.17	33.70	32.97
	% MUD:	1.73	2.17	1.22	0.54	1.95	0.54	1.05	2.48
	% V COARSE GRAVEL:	38.10	10.83	8.18	15.59	0.00	15.34	21.70	0.00
	% COARSE GRAVEL:	21.48	23.97	42.99	22.57	35.53	13.10	30.65	36.51
	% MEDIUM GRAVEL:	6.33	14.34	20.70	22.64	21.71	13.73	3.42	16.73
	% FINE GRAVEL:	6.71	10.41	10.20	16.75	14.15	8.79	4.42	7.78
	% V FINE GRAVEL:	7.86	9.51	5.96	5.60	7.98	6.33	5.05	3.53
	% V COARSE SAND:	6.64	8.29	2.52	3.01	4.83	4.72	4.77	1.93
	% COARSE SAND:	2.82	4.07	2.16	5.75	2.85	10.12	8.61	9.33
	% MEDIUM SAND:	5.45	9.96	4.01	6.17	6.52	21.77	17.75	12.31
	% FINE SAND:	2.45	5.58	1.73	1.17	4.15	5.54	2.52	7.29
	% V FINE SAND:	0.43	0.87	0.33	0.21	0.34	0.02	0.04	2.12
	% V COARSE SILT:	0.43	0.55	0.29	0.20	0.32	0.22	0.29	0.79
	% COARSE SILT:	0.34	0.39	0.22	0.07	0.50	0.07	0.11	0.44
	% MEDIUM SILT:	0.36	0.44	0.28	0.12	0.51	0.10	0.28	0.50
	% FINE SILT:	0.35	0.47	0.27	0.10	0.42	0.11	0.26	0.48
	% V FINE SILT:	0.20	0.27	0.15	0.05	0.19	0.04	0.10	0.26
% CLAY:	0.04	0.05	0.03	0.00	0.02	0.00	0.00	0.01	
% LOI		1.87	1.20	0.77	1.01	0.90	1.31	0.86	3.19



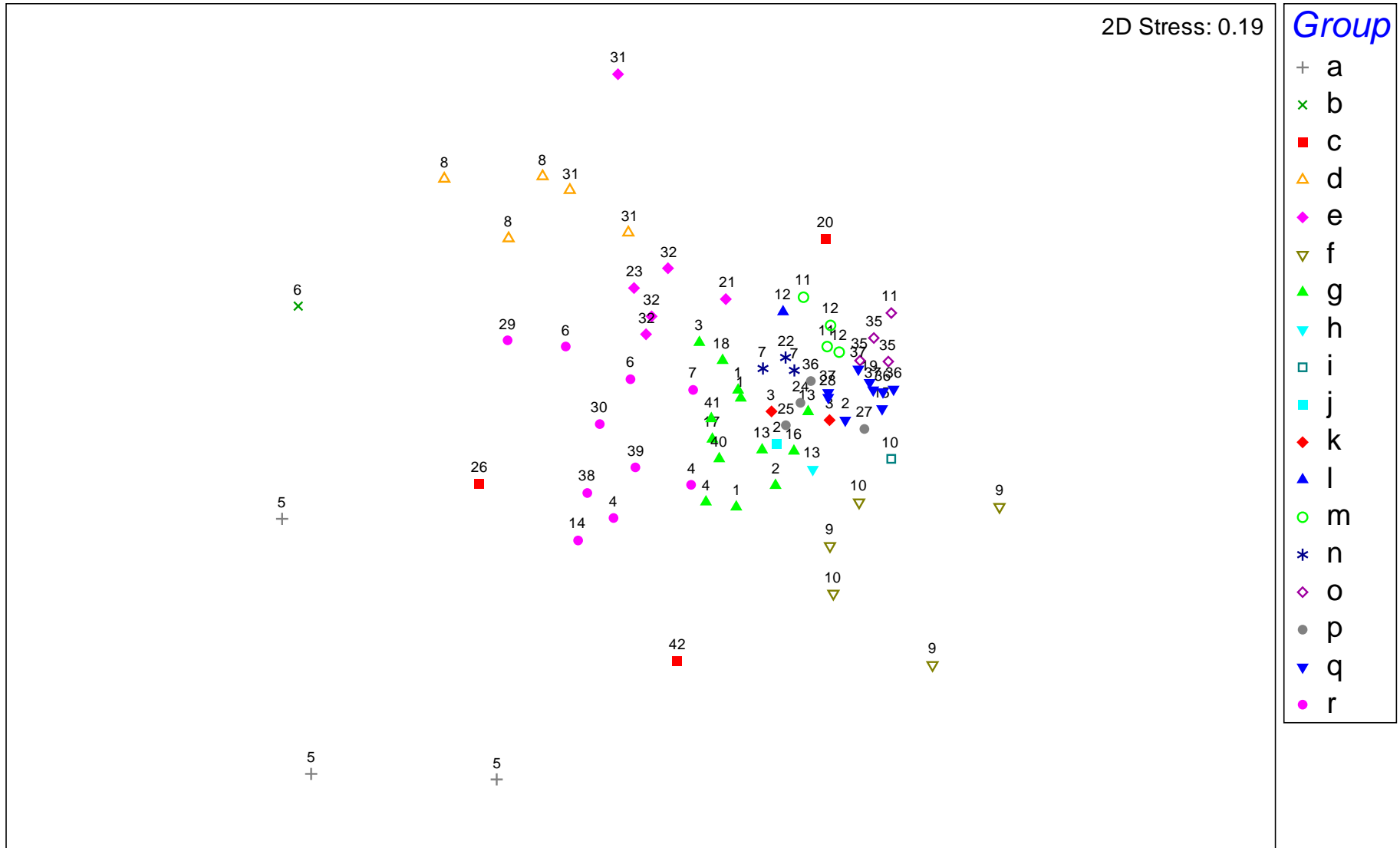
SAMPLE	PARAMETER	25	26	27	28	29	30	31
SAMPLE TYPE		Unimodal, Poorly Sorted	Trimodal, Very Poorly Sorted	Bimodal, Very Poorly Sorted	Bimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Bimodal, Very Poorly Sorted
TEXTURAL GROUP		Gravel	Sandy Gravel	Muddy Sandy Gravel	Gravel	Muddy Sandy Gravel	Sandy Gravel	Gravel
SEDIMENT NAME		Coarse Gravel	Sandy Coarse Gravel	Very Coarse Silty Sandy Coarse Gravel	Coarse Gravel	Coarse Silty Sandy Medium Gravel	Sandy Medium Gravel	Coarse Gravel
FOLK AND WARD METHOD (mm)	MEDIAN GRAIN SIZE (mm)	22846.32	13169.56	10790.16	20911.09	3262.18	5260.54	19835.18
	MEAN GRAIN SIZE (mm)	10801.25	7565.98	5640.40	8856.74	2429.55	3576.62	10309.55
	SORTING	3.86	4.87	5.60	5.72	7.03	4.65	4.56
	SKEWNESS	-0.85	-0.51	-0.58	-0.71	-0.30	-0.39	-0.70
	KURTOSIS	1.24	0.78	0.99	1.15	0.77	0.90	1.16
FOLK AND WARD METHOD (Phi - $\phi$ )	MEDIAN GRAIN SIZE ( $\phi$ )	-4.51	-3.72	-3.43	-4.39	-1.71	-2.40	-4.31
	MEAN GRAIN SIZE ( $\phi$ )	-3.43	-2.92	-2.50	-3.15	-1.28	-1.84	-3.37
	SORTING	1.95	2.29	2.49	2.52	2.81	2.22	2.19
	SKEWNESS	0.85	0.51	0.58	0.71	0.30	0.39	0.70
	KURTOSIS	1.24	0.78	0.99	1.15	0.77	0.90	1.16
FOLK AND WARD DESCRIPTION	MEAN:	Medium Gravel	Fine Gravel	Fine Gravel	Medium Gravel	Very Fine Gravel	Very Fine Gravel	Medium Gravel
	SORTING:	Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted
	SKEWNESS:	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	KURTOSIS:	Leptokurtic	Platykurtic	Mesokurtic	Leptokurtic	Platykurtic	Mesokurtic	Leptokurtic
BULK GRAIN SIZE	% GRAVEL:	83.78	76.32	77.07	81.14	56.90	71.23	83.00
	% SAND:	15.21	22.11	20.11	17.15	37.60	26.69	15.27
	% MUD:	1.01	1.57	2.82	1.71	5.50	2.08	1.73
	% V COARSE GRAVEL:	0.00	15.32	0.00	30.80	0.00	0.00	15.57
	% COARSE GRAVEL:	62.64	31.12	39.59	30.85	16.97	14.79	38.45
	% MEDIUM GRAVEL:	11.00	11.26	18.63	9.24	17.86	22.39	14.98
	% FINE GRAVEL:	4.85	8.72	11.16	6.39	12.16	21.33	7.28
	% V FINE GRAVEL:	5.29	9.90	7.69	3.87	9.90	12.73	6.72
	% V COARSE SAND:	4.86	8.14	5.65	2.48	7.88	6.90	4.42
	% COARSE SAND:	3.74	6.03	2.81	3.43	8.23	7.31	2.75
	% MEDIUM SAND:	4.49	6.31	6.08	6.78	12.18	7.75	4.12
	% FINE SAND:	1.72	1.14	3.96	3.42	6.79	3.44	2.99
	% V FINE SAND:	0.40	0.49	1.60	1.04	2.51	1.29	0.99
	% V COARSE SILT:	0.21	0.45	0.77	0.54	1.24	0.40	0.34
	% COARSE SILT:	0.18	0.29	0.50	0.24	1.33	0.38	0.41
	% MEDIUM SILT:	0.26	0.35	0.60	0.35	1.29	0.50	0.41
	% FINE SILT:	0.23	0.29	0.57	0.35	1.02	0.47	0.34
	% V FINE SILT:	0.11	0.15	0.32	0.19	0.53	0.28	0.19
% CLAY:	0.01	0.02	0.05	0.03	0.08	0.05	0.03	
% LOI		1.06	0.74	1.75	1.56	1.56	1.36	1.03

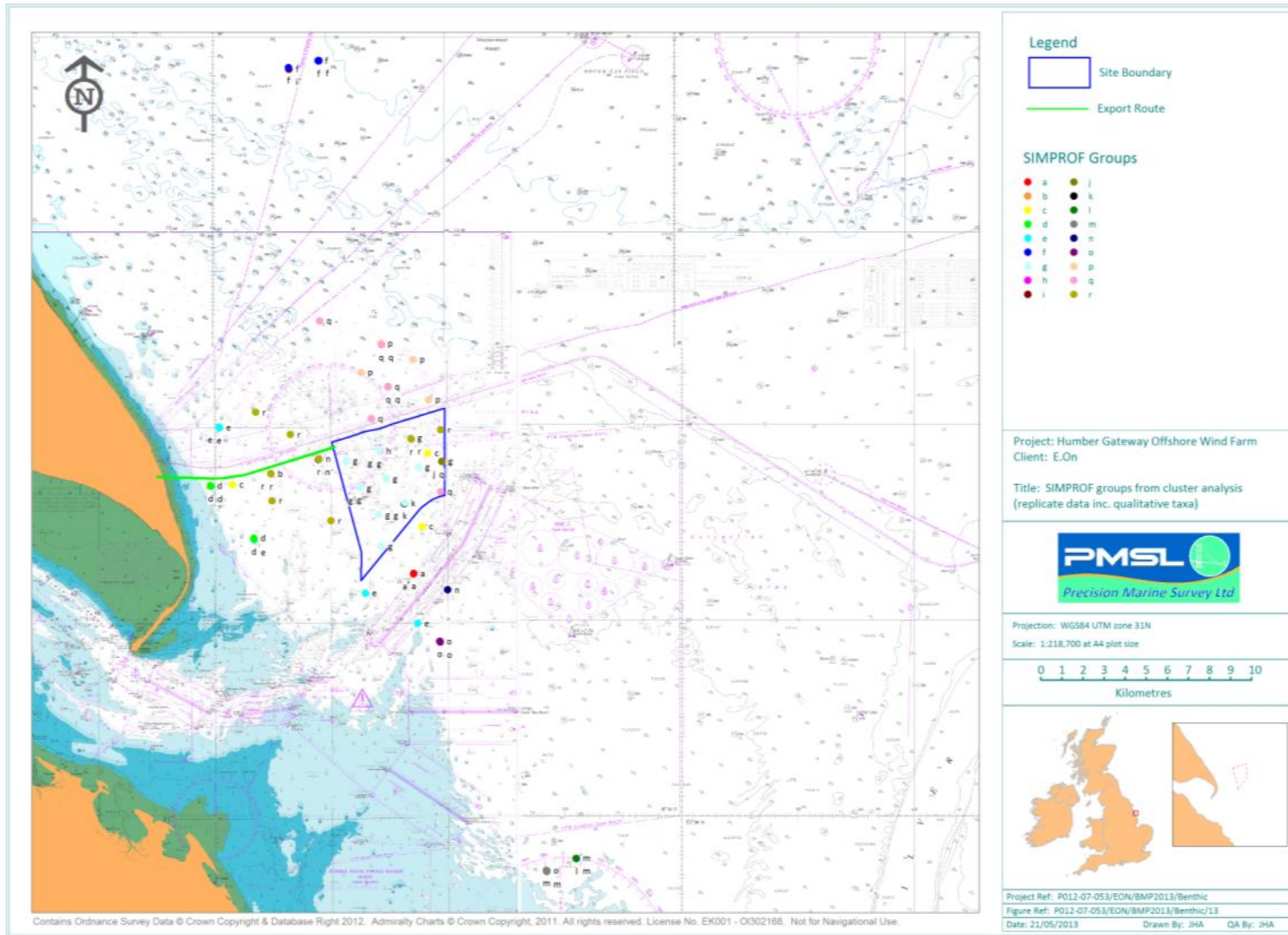
SAMPLE	PARAMETER	32	35	36	37	38	39	40	41	42
SAMPLE TYPE		Polymodal, Very Poorly Sorted	Bimodal, Very Poorly Sorted	Unimodal, Very Poorly Sorted	Unimodal, Poorly Sorted	Bimodal, Poorly Sorted	Trimodal, Very Poorly Sorted	Trimodal, Very Poorly Sorted	Bimodal, Very Poorly Sorted	Unimodal, Moderately Well Sorted
TEXTURAL GROUP		Sandy Gravel	Sandy Gravel	Sandy Gravel	Gravel	Gravel	Sandy Gravel	Muddy Sandy Gravel	Gravel	Gravel
SEDIMENT NAME		Sandy Medium Gravel	Sandy Coarse Gravel	Sandy Coarse Gravel	Coarse Gravel	Fine Gravel	Sandy Very Coarse Gravel	Medium Silty Sandy Coarse Gravel	Coarse Gravel	Very Coarse Gravel
FOLK AND WARD METHOD (mm)	MEDIAN GRAIN SIZE (mm)	2691.03	18243.91	11763.65	18271.85	6056.86	9051.00	13729.87	17009.31	68969.93
	MEAN GRAIN SIZE (mm)	2604.92	6866.50	6725.74	14590.32	6257.27	6580.70	8020.65	10465.42	62389.32
	SORTING	4.67	6.13	4.46	2.78	2.71	5.45	5.23	4.25	1.43
	SKEWNESS	-0.04	-0.71	-0.59	-0.52	-0.02	-0.32	-0.53	-0.55	-0.53
	KURTOSIS	0.66	0.99	1.04	1.73	0.97	0.77	0.96	0.96	1.22
FOLK AND WARD METHOD (Phi - ϕ)	MEDIAN GRAIN SIZE (ϕ)	-1.43	-4.19	-3.56	-4.19	-2.60	-3.18	-3.78	-4.09	-6.11
	MEAN GRAIN SIZE (ϕ)	-1.38	-2.78	-2.75	-3.87	-2.65	-2.72	-3.00	-3.39	-5.96
	SORTING	2.22	2.62	2.16	1.47	1.44	2.45	2.39	2.09	0.51
	SKEWNESS	0.04	0.71	0.59	0.52	0.02	0.32	0.53	0.55	0.53
	KURTOSIS	0.66	0.99	1.04	1.73	0.97	0.77	0.96	0.96	1.22
FOLK AND WARD DESCRIPTION	MEAN:	Very Fine Gravel	Fine Gravel	Fine Gravel	Medium Gravel	Fine Gravel	Fine Gravel	Medium Gravel	Medium Gravel	Very Coarse Gravel
	SORTING:	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Poorly Sorted	Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Very Poorly Sorted	Moderately Well Sorted
	SKEWNESS:	Symmetrical	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Symmetrical	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	KURTOSIS:	Very Platykurtic	Mesokurtic	Mesokurtic	Very Leptokurtic	Mesokurtic	Platykurtic	Mesokurtic	Mesokurtic	Leptokurtic
BULK GRAIN SIZE	% GRAVEL:	55.41	77.47	79.48	91.72	87.49	76.71	78.58	83.42	99.81
	% SAND:	42.69	21.09	19.03	7.96	11.65	22.74	18.65	15.94	0.18
	% MUD:	1.90	1.43	1.49	0.32	0.86	0.55	2.77	0.65	0.00
	% V COARSE GRAVEL:	0.00	15.80	0.00	11.00	0.00	26.08	18.66	24.19	89.98
	% COARSE GRAVEL:	13.36	38.31	38.96	48.34	18.82	14.08	27.72	28.24	7.75
	% MEDIUM GRAVEL:	16.23	13.66	20.83	20.47	20.25	12.05	14.07	14.01	1.68
	% FINE GRAVEL:	13.70	5.96	11.37	7.43	27.63	13.82	10.04	9.62	0.15
	% V FINE GRAVEL:	12.12	3.75	8.31	4.48	20.80	10.68	8.10	7.36	0.25
	% V COARSE SAND:	11.27	3.55	5.12	2.31	8.01	6.48	6.36	5.78	0.16
	% COARSE SAND:	14.74	3.81	3.96	1.96	1.73	5.25	4.53	3.96	0.01
	% MEDIUM SAND:	14.06	8.32	5.90	2.20	1.29	7.77	4.68	4.40	0.01
	% FINE SAND:	1.97	4.58	3.20	1.13	0.33	3.04	2.28	1.41	0.00
	% V FINE SAND:	0.65	0.83	0.86	0.36	0.28	0.20	0.80	0.39	0.00
	% V COARSE SILT:	0.57	0.47	0.39	0.13	0.15	0.20	0.51	0.22	0.00
	% COARSE SILT:	0.23	0.28	0.24	0.05	0.17	0.10	0.52	0.12	0.00
	% MEDIUM SILT:	0.44	0.27	0.32	0.06	0.24	0.10	0.70	0.14	0.00
	% FINE SILT:	0.40	0.27	0.33	0.05	0.20	0.11	0.65	0.11	0.00
% V FINE SILT:	0.23	0.14	0.19	0.02	0.09	0.04	0.33	0.06	0.00	
% CLAY:	0.02	0.01	0.03	0.00	0.01	0.00	0.05	0.00	0.00	
% LOI		1.44	1.73	1.26	2.10	1.16	1.02	1.76	1.24	-

### Appendix 6 Multivariate analysis incorporating qualitative data (replicate data)









*Group a*

Average similarity: 22.16

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
NEMATODA sp.	1.15	14.66	0.58	66.13	66.13
Goodallia triangularis	1.14	7.51	0.58	33.87	100.00

*Group b*

Less than 2 samples in group

*Group c*

Average similarity: 32.19

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Crisia sp.	1.00	4.74	4.65	14.73	14.73
Scrupocellaria scruposa	1.00	4.74	4.65	14.73	29.46
Escharella ventricosa	1.00	4.74	4.65	14.73	44.19
Dendrodoa grossularia	1.00	4.74	4.65	14.73	58.92
Rissoa parva	1.33	2.61	0.58	8.10	67.03
Sertularia sp.	0.67	1.96	0.58	6.09	73.12
Tubulipora sp.	0.67	1.96	0.58	6.09	79.21
Leptochiton asellus	0.67	1.48	0.58	4.59	83.80
Musculus discors juv.	0.80	1.30	0.58	4.05	87.85
Balanus crenatus	0.67	1.30	0.58	4.05	91.90

*Group d*

Average similarity: 43.94

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Sabellaria spinulosa	2.98	15.52	5.95	35.33	35.33
Polycirrus sp.	1.17	5.92	5.63	13.47	48.80
Amathia lendigera	1.00	5.71	5.82	12.99	61.79
Unciola crenatipalma	0.99	1.97	0.57	4.49	66.28
Spio armata agg.	0.68	1.83	0.61	4.17	70.46
Alcyonidium diaphanum	0.60	1.74	0.61	3.96	74.41
Plocamium cartilagineum	0.60	1.69	0.62	3.84	78.25
Eumida sanguinea	0.60	1.65	0.62	3.76	82.01
Amphipholis squamata	0.80	1.49	0.62	3.40	85.41
Scrupocellaria scruposa	0.60	1.49	0.62	3.40	88.80
Orchomene humilis	0.93	1.43	0.62	3.25	92.06

*Group e*

Average similarity: 39.04

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Sabellaria spinulosa	5.22	10.81	3.36	27.69	27.69
Electra pilosa	1.00	2.63	4.07	6.73	34.42
Dendrodoa grossularia	1.00	2.63	4.07	6.73	41.15
NEMATODA sp.	1.62	2.42	1.25	6.19	47.34
Spio armata agg.	1.24	2.08	1.27	5.33	52.66
Lepidonotus squamatus	1.02	1.87	1.27	4.78	57.45
Balanus crenatus	0.83	1.81	1.26	4.63	62.08
Amphipholis squamata	1.02	1.54	1.33	3.96	66.03
Alcyonidium diaphanum	0.83	1.49	1.35	3.81	69.84
Hiatella arctica	1.11	1.12	0.76	2.87	72.71
Hydrallmania falcata	0.67	0.93	0.79	2.37	75.08
Schizomavella sp.	0.67	0.93	0.79	2.37	77.45
Amphiblestrum auritum	0.67	0.84	0.79	2.15	79.60
Leptochiton asellus	0.71	0.54	0.47	1.39	80.99
Polycirrus sp.	0.86	0.54	0.46	1.38	82.37
Escharella ventricosa	0.50	0.48	0.48	1.24	83.61
Glycera lapidum agg.	0.50	0.47	0.48	1.20	84.81
Bicellariella ciliata	0.50	0.46	0.48	1.18	85.99
Achelia echinata	0.62	0.46	0.48	1.17	87.17
Crisia sp.	0.50	0.43	0.48	1.10	88.27
NEMERTEA sp.	0.62	0.42	0.48	1.08	89.36
Syllis armillaris	0.50	0.41	0.48	1.05	90.40



*Group f*

Average similarity: 35.28

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Chone sp.	2.81	3.27	2.58	9.26	9.26
Spirobranchus triqueter	1.84	2.25	5.20	6.37	15.63
Mediomastus fragilis	2.32	2.22	4.86	6.30	21.93
NEMERTEA sp.	1.93	1.96	2.71	5.54	27.48
Glycera lapidum agg.	1.15	1.47	5.10	4.18	31.65
Leptochiton asellus	1.74	1.46	1.13	4.14	35.79
Timoclea ovata	1.26	1.06	1.12	3.02	38.81
Amphipholis squamata	1.08	0.95	1.13	2.68	41.49
Caulerliella zetlandica	1.08	0.87	1.07	2.47	43.96
Lumbrineris cingulata	1.08	0.85	1.14	2.42	46.38
Crisia sp.	0.80	0.83	1.12	2.36	48.74
Bugula flabellata	0.80	0.83	1.12	2.36	51.09
Scrupocellaria scruposa	0.80	0.83	1.12	2.36	53.45
Melinna elisabethae	1.69	0.62	0.54	1.75	55.21
Pisidia longicornis	1.35	0.61	0.57	1.72	56.93
Achelia echinata	0.97	0.57	0.61	1.63	58.55
Nucula nucleus	0.85	0.56	0.61	1.60	60.15
Urothoe elegans	1.06	0.55	0.61	1.57	61.72
Tubulipora sp.	0.60	0.53	0.62	1.51	63.23
Microporella ciliata	0.60	0.53	0.62	1.51	64.74
Clymenura sp.	0.88	0.50	0.61	1.42	66.16
Aonides paucibranchiata	0.68	0.48	0.62	1.36	67.53
Verruca stroemi	0.60	0.48	0.62	1.36	68.89
Crisidia cornuta	0.60	0.48	0.62	1.36	70.25
Harmothoe impar	0.60	0.46	0.62	1.31	71.55
Ampelisca spinipes	0.77	0.45	0.62	1.28	72.83
Galathowenia oculata	0.93	0.45	0.61	1.27	74.11
Ampharetinae sp. juv.	1.28	0.44	0.61	1.25	75.36
Spiophanes kroyeri	0.83	0.44	0.62	1.24	76.60
Galathea intermedia	0.93	0.42	0.59	1.20	77.79
Abra alba	0.77	0.42	0.59	1.20	78.99
Nephtys caeca	0.60	0.41	0.61	1.18	80.16
Euchone rubrocincta	0.80	0.41	0.61	1.15	81.31
Nuculana minuta	0.68	0.40	0.61	1.13	82.44
Halecium sp.	0.60	0.40	0.61	1.13	83.57
Schizomavella sp.	0.60	0.39	0.61	1.11	84.68
Hydroides norvegica	0.89	0.36	0.62	1.03	85.71
Cheirocratus sp. female	0.68	0.36	0.62	1.03	86.74
Ebalia tuberosa	0.68	0.36	0.62	1.03	87.77
Bicellariella ciliata	0.60	0.36	0.62	1.03	88.80
Ampelisca diadema	1.47	0.33	0.32	0.92	89.73
Eteone longa agg.	0.40	0.20	0.32	0.56	90.29

**Group g**

Average similarity: 44.05

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
NEMATODA sp.	2.52	2.82	1.67	6.41	6.41
Spio armata agg.	2.12	2.73	1.78	6.19	12.60
Pisidia longicornis	2.12	2.30	1.31	5.22	17.82
Scrupocellaria scruposa	1.00	1.79	5.56	4.06	21.88
Amphipholis squamata	1.53	1.71	1.29	3.88	25.76
Glycera lapidum agg.	1.22	1.69	2.04	3.83	29.59
Crisia sp.	0.92	1.49	2.12	3.38	32.97
Gibbula tumida	1.22	1.46	1.05	3.31	36.28
Leptochiton asellus	1.30	1.46	1.07	3.31	39.59
Galathea intermedia	1.37	1.37	1.02	3.11	42.70
Achelia echinata	1.43	1.37	1.02	3.11	45.81
Ophiopholis aculeata	1.68	1.30	0.73	2.96	48.77
Lepidonotus squamatus	1.15	1.20	1.10	2.72	51.49
NEMERTEA sp.	1.10	1.19	1.10	2.69	54.18
Hiatella arctica	0.91	1.16	1.12	2.64	56.82
Pholoe baltica	1.19	1.03	0.86	2.35	59.17
Escharella immersa	0.77	1.01	1.11	2.28	61.45
Polycirrus sp.	1.09	0.98	0.88	2.24	63.69
Dendrodoa grossularia	0.80	0.98	1.12	2.22	65.91
Syllis columbretensis	0.90	0.84	0.88	1.90	67.81
Tubulipora sp.	0.62	0.66	0.73	1.51	69.32
Syllis armillaris	0.95	0.65	0.70	1.47	70.79
Verruca stroemi	0.62	0.65	0.72	1.47	72.26
Phaeostachys spinifera	0.62	0.64	0.72	1.46	73.72
Ophiothrix fragilis	0.88	0.60	0.73	1.37	75.09
Balanus crenatus	0.62	0.60	0.72	1.37	76.46
Alcyonidium diaphanum	0.62	0.59	0.72	1.34	77.80
Onoba semicostata	0.88	0.54	0.58	1.23	79.03
Sabellaria spinulosa	0.77	0.54	0.58	1.23	80.26
Harmothoe impar	0.76	0.53	0.58	1.21	81.47
Scalibregma celticum	0.60	0.48	0.59	1.09	82.56
Golfingia vulgaris vulgaris	0.65	0.47	0.59	1.07	83.63
Microporella ciliata	0.54	0.47	0.59	1.06	84.69
Schizomavella sp.	0.54	0.45	0.59	1.02	85.71
Sertularia sp.	0.46	0.39	0.48	0.89	86.59
Polynoidae sp.	0.62	0.37	0.47	0.83	87.42
Amathia lendigera	0.46	0.36	0.47	0.82	88.24
Modiolus juv.	0.46	0.35	0.47	0.80	89.04
Aonides paucibranchiata	0.64	0.32	0.48	0.73	89.77
Mediomastus fragilis	0.66	0.32	0.46	0.73	90.49

**Group h**

Less than 2 samples in group

**Group i**

Less than 2 samples in group

**Group j**

Less than 2 samples in group

**Group k**

Average similarity: 59.50

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	9.11	12.27	#####	20.63	20.63
Orchomene humilis	3.48	3.86	#####	6.48	27.11
Galathea intermedia	3.00	2.73	#####	4.58	31.69
Amphipholis squamata	2.41	2.73	#####	4.58	36.28
Gibbula tumida	2.45	2.36	#####	3.97	40.25
Lepidonotus squamatus	1.57	1.93	#####	3.24	43.49
Glycera lapidum agg.	1.41	1.93	#####	3.24	46.73
Spio armata agg.	1.83	1.93	#####	3.24	49.97
Achelia echinata	2.12	1.93	#####	3.24	53.21
Modiolus juv.	1.41	1.93	#####	3.24	56.45
NEMATODA sp.	1.37	1.36	#####	2.29	58.75
Harmothoe fragilis	1.21	1.36	#####	2.29	61.04
Harmothoe impar	1.91	1.36	#####	2.29	63.33
Aonides oxycephala	1.00	1.36	#####	2.29	65.62
Caulleriella alata	1.00	1.36	#####	2.29	67.91
Sabellaria spinulosa	1.00	1.36	#####	2.29	70.21
Othomaera othonis	1.21	1.36	#####	2.29	72.50
Leptochiton asellus	1.37	1.36	#####	2.29	74.79
Ophiopholis aculeata	1.21	1.36	#####	2.29	77.08
Crisidia cornuta	1.00	1.36	#####	2.29	79.37
Crisia sp.	1.00	1.36	#####	2.29	81.66
Alcyonidium diaphanum	1.00	1.36	#####	2.29	83.96
Amathia lendigera	1.00	1.36	#####	2.29	86.25
Electra pilosa	1.00	1.36	#####	2.29	88.54
Flustra foliacea	1.00	1.36	#####	2.29	90.83

*Group l*

Less than 2 samples in group

*Group m*

Average similarity: 54.47

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Sabellaria spinulosa	5.78	5.62	6.76	10.32	10.32
Pisidia longicornis	5.39	4.20	1.71	7.72	18.04
Melinna elisabethae	2.78	2.64	4.50	4.85	22.89
Nucula nucleus	1.99	2.04	6.84	3.75	26.64
Protodorvillea kefersteini	2.13	1.84	2.06	3.38	30.02
Cirriformia tentaculata	1.72	1.71	11.62	3.13	33.15
Spirobranchus lamarcki	2.13	1.70	4.06	3.11	36.26
Gibbula tumida	1.88	1.68	6.38	3.08	39.34
Rissoa parva	2.87	1.58	0.80	2.90	42.24
NEMERTEA sp.	1.74	1.54	2.88	2.84	45.07
Abra alba	2.06	1.52	2.38	2.79	47.86
Amphipholis squamata	1.66	1.40	4.20	2.57	50.44
Mediomastus fragilis	2.26	1.36	0.91	2.50	52.94
Spio armata agg.	1.39	1.31	6.54	2.40	55.33
Achelia echinata	1.43	1.21	4.97	2.22	57.55
Scalibregma inflatum	1.29	1.17	5.54	2.14	59.70
Eteone foliosa	1.00	1.09	13.19	2.00	61.70
Cheirocratus sp. female	1.25	1.09	13.19	2.00	63.70
Crisia sp.	1.00	1.09	13.19	2.00	65.70
Amathia lendigera	1.00	1.09	13.19	2.00	67.70
Scrupocellaria scruposa	1.00	1.09	13.19	2.00	69.70
Escharella immersa	1.00	1.09	13.19	2.00	71.70
Dendrodoa grossularia	1.00	1.09	13.19	2.00	73.70
Sphaerosyllis taylori	1.30	0.91	0.91	1.68	75.38
Syllis columbretensis	1.41	0.84	0.88	1.54	76.92
Eteone longa agg.	1.14	0.74	0.91	1.35	78.28
NEMATODA sp.	1.04	0.66	0.87	1.21	79.49
Lepidonotus squamatus	0.96	0.59	0.88	1.09	80.58
Harmothoe impar	1.26	0.59	0.90	1.08	81.66
Laonice bahusiensis	1.04	0.59	0.90	1.08	82.74
Thoralus cranchii	0.75	0.58	0.91	1.06	83.80
Amphiblestrum auritum	0.75	0.56	0.91	1.02	84.82
Glycera lapidum agg.	0.93	0.53	0.91	0.97	85.79
Molgula sp.	0.75	0.53	0.91	0.97	86.75
Aonides paucibranchiata	1.00	0.52	0.91	0.96	87.71
Nuculana minuta	0.93	0.52	0.91	0.96	88.67
Onoba semicostata	1.36	0.40	0.41	0.73	89.40
Terebellidae sp. juv.	1.06	0.37	0.41	0.69	90.09

*Group n*

Average similarity: 53.27

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Onoba semicostata	4.96	6.23	7.20	11.70	11.70
Spio armata agg.	2.83	3.42	4.32	6.42	18.11
Sabellaria spinulosa	2.29	2.96	11.49	5.55	23.66
Pisidia longicornis	2.33	2.86	7.20	5.37	29.03
NEMERTEA sp.	2.14	2.68	17.14	5.03	34.06
Nucula nucleus	2.23	2.52	2.71	4.73	38.79
Manzonina crassa	2.34	2.26	11.20	4.24	43.04
Syllis columbretensis	1.93	2.17	5.43	4.08	47.12
Amphipholis squamata	2.15	2.15	17.18	4.04	51.16
Mediomastus fragilis	1.38	1.65	2.94	3.10	54.26
Pholoe baltica	1.47	1.63	3.96	3.06	57.32
Glycera lapidum agg.	1.28	1.63	3.96	3.06	60.38
Harmothoe impar	1.28	1.60	11.20	3.00	63.38
Leptochiton asellus	1.33	1.43	7.20	2.68	66.06
Phoronis sp.	1.41	1.43	7.20	2.68	68.74
Balanus crenatus	1.00	1.43	7.20	2.68	71.43
Amathia lendigera	1.00	1.43	7.20	2.68	74.11
Amphiblestrum auritum	1.00	1.43	7.20	2.68	76.79
Escharella immersa	1.00	1.43	7.20	2.68	79.48
Dendrodoa grossularia	1.00	1.43	7.20	2.68	82.16
Gibbula tumida	1.05	0.76	0.58	1.43	83.59
Polycirrus sp.	0.94	0.58	0.58	1.08	84.68
Gibbula cineraria	1.29	0.58	0.58	1.08	85.76
Hiatella arctica	1.14	0.58	0.58	1.08	86.84
Orchomene humilis	0.91	0.54	0.58	1.01	87.85
Tubulipora sp.	0.67	0.54	0.58	1.01	88.87
Eteone longa agg.	0.67	0.48	0.58	0.91	89.77
Achelia echinata	1.08	0.48	0.58	0.91	90.68



*Group o*

Average similarity: 55.90

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Nucula nucleus	4.52	4.55	6.99	8.13	8.13
Pisidia longicornis	4.68	4.49	10.12	8.04	16.17
Onoba semicostata	3.93	3.37	3.49	6.03	22.20
Amphipholis squamata	2.90	2.55	3.65	4.57	26.77
Harmothoe impar	2.41	2.33	8.86	4.17	30.94
Mediomastus fragilis	2.64	2.23	5.34	3.98	34.92
Sabellaria spinulosa	2.81	1.95	3.19	3.48	38.40
Syllis armillaris	2.07	1.90	6.00	3.40	41.81
Rissoa parva	1.85	1.79	4.77	3.21	45.01
Manzonina crassa	1.88	1.74	5.46	3.12	48.13
Caulerliella alata	1.57	1.61	15.49	2.88	51.01
Nuculana minuta	1.97	1.55	2.11	2.78	53.79
Thoralus cranchii	1.55	1.49	3.74	2.66	56.45
Lepidonotus squamatus	1.85	1.42	4.12	2.53	58.99
Galathea intermedia	1.64	1.23	3.91	2.20	61.19
Spio armata agg.	1.86	1.15	0.89	2.05	63.24
Melinna elisabethae	1.87	1.12	0.91	2.00	65.24
Orchomenella nana	1.00	1.10	12.33	1.97	67.21
Gibbula tumida	1.00	1.10	12.33	1.97	69.18
Verruca stroemi	1.00	1.10	12.33	1.97	71.15
Amathia lendigera	1.00	1.10	12.33	1.97	73.12
Scrupocellaria scruposa	1.00	1.10	12.33	1.97	75.09
Dendrodoa grossularia	1.00	1.10	12.33	1.97	77.06
Achelia echinata	1.43	0.96	0.91	1.71	78.77
Syllis columbretensis	1.57	0.89	0.89	1.58	80.35
Scalibregma celticum	1.14	0.74	0.91	1.33	81.68
Abra alba	1.18	0.69	0.86	1.23	82.92
Cheirocratus intermedius	1.18	0.67	0.82	1.20	84.12
Cheirocratus sp. female	0.96	0.60	0.88	1.08	85.20
Harpinia antennaria	0.85	0.58	0.91	1.05	86.25
Eteone longa agg.	0.75	0.56	0.91	1.00	87.25
Scalibregma inflatum	0.93	0.56	0.91	1.00	88.25
Crisia sp.	0.75	0.56	0.91	1.00	89.25
Escharella ventricosa	0.75	0.56	0.91	1.00	90.25

*Group p*

Average similarity: 56.85

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	4.95	5.15	3.60	9.06	9.06
Amphipholis squamata	2.27	2.94	6.77	5.17	14.22
Abra alba	2.20	2.49	4.90	4.37	18.60
Onoba semicostata	2.10	2.45	3.78	4.30	22.90
Mediomastus fragilis	1.72	2.29	9.00	4.03	26.93
Galathea intermedia	2.49	2.29	5.02	4.03	30.96
Pholoe baltica	1.57	2.14	10.32	3.76	34.72
Achelia echinata	1.47	1.87	3.22	3.28	38.01
Lepidonotus squamatus	1.60	1.82	4.93	3.21	41.21
Caulerliella alata	1.00	1.46	11.10	2.57	43.78
Gnathia dentata	1.10	1.46	11.10	2.57	46.36
Thoralus cranchii	1.54	1.46	11.10	2.57	48.93
Verruca stroemi	1.00	1.46	11.10	2.57	51.50
Crisidia cornuta	1.00	1.46	11.10	2.57	54.07
Crisia sp.	1.00	1.46	11.10	2.57	56.64
Tubulipora sp.	1.00	1.46	11.10	2.57	59.21
Amathia lendigera	1.00	1.46	11.10	2.57	61.78
Callopora sp.	1.00	1.46	11.10	2.57	64.35
Scrupocellaria scruposa	1.00	1.46	11.10	2.57	66.93
Escharella immersa	1.00	1.46	11.10	2.57	69.50
Schizomavella sp.	1.00	1.46	11.10	2.57	72.07
Nucula nucleus	1.29	1.05	0.91	1.85	73.92
Gibbula tumida	1.18	0.90	0.87	1.59	75.51
Spio armata agg.	1.31	0.90	0.87	1.58	77.09
NEMERTEA sp.	1.10	0.89	0.89	1.57	78.66
Aonides oxycephala	1.12	0.88	0.85	1.54	80.20
Hiatella arctica	1.30	0.86	0.87	1.52	81.72
Glycera lapidum agg.	1.04	0.83	0.89	1.46	83.19
Leptochiton asellus	1.04	0.79	0.90	1.38	84.57
Syllis columbretensis	0.85	0.71	0.91	1.24	85.81
Hemilepton nitidum	1.00	0.71	0.91	1.24	87.05
Balanus crenatus	0.75	0.71	0.91	1.24	88.30
Cellaria sp.	0.75	0.71	0.91	1.24	89.54
Nuculana minuta	0.75	0.70	0.91	1.22	90.76

Group q

Average similarity: 56.23

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	8.10	5.85	9.42	10.40	10.40
Amphipholis squamata	3.42	2.75	5.50	4.90	15.30
Achelia echinata	3.37	2.24	1.73	3.99	19.29
Onoba semicostata	2.90	2.17	6.61	3.85	23.14
Mediomastus fragilis	3.06	1.85	2.14	3.29	26.44
Leptochiton asellus	2.30	1.81	6.79	3.22	29.66
Harmothoe impar	2.30	1.66	3.72	2.95	32.61
Hiatella arctica	2.26	1.39	1.62	2.47	35.08
Gibbula tumida	1.90	1.36	1.71	2.43	37.50
Callipallene brevirostris	1.97	1.36	3.36	2.42	39.93
Nucula nucleus	1.76	1.30	5.88	2.32	42.25
Galathea intermedia	1.73	1.27	3.57	2.26	44.51
Lepidonotus squamatus	1.76	1.12	1.69	1.99	46.50
Sabellaria spinulosa	1.77	1.05	1.13	1.86	48.36
Harmothoe sp.	1.70	0.96	1.13	1.71	50.07
Verruca stroemi	1.00	0.90	7.86	1.60	51.67
Balanus crenatus	1.00	0.90	7.86	1.60	53.27
Crisia sp.	1.00	0.90	7.86	1.60	54.87
Dendrodoa grossularia	1.00	0.90	7.86	1.60	56.46
Nuculana minuta	1.42	0.88	1.62	1.56	58.02
Musculus discors juv.	1.54	0.87	1.61	1.54	59.56
Caulerliella alata	1.46	0.85	1.69	1.52	61.08
Abra alba	1.31	0.84	1.68	1.49	62.57
Melinna elisabethae	1.41	0.82	1.07	1.46	64.03
Hinia incrassata	1.14	0.76	1.78	1.35	65.37
Pholoe baltica	1.25	0.71	1.12	1.26	66.63
Escharella immersa	0.89	0.71	1.78	1.25	67.88
Schizomavella sp.	0.89	0.70	1.78	1.25	69.14
Amathia lendigera	0.89	0.70	1.78	1.25	70.38
Scrupocellaria scruposa	0.89	0.69	1.78	1.24	71.62
Syllis columbretensis	1.26	0.66	1.06	1.18	72.80
Pholoe inornata	0.99	0.60	1.10	1.06	73.87
Manzonina crassa	1.03	0.59	1.14	1.04	74.91
Hemilepton nitidum	1.00	0.58	1.13	1.03	75.94
Spio armata agg.	1.38	0.56	0.77	1.00	76.94
Cheirocratus sp. female	1.07	0.56	1.09	1.00	77.94
Eteone longa agg.	1.00	0.56	1.12	1.00	78.94
Alcyonidium diaphanum	0.78	0.55	1.15	0.97	79.91
Crisidia cornuta	0.78	0.53	1.14	0.94	80.84
Scalibregma celticum	1.15	0.46	0.76	0.81	81.65
Parvicardium ovale	0.91	0.42	0.77	0.74	82.40
Mya sp. juv.	0.84	0.40	0.82	0.72	83.12
Tubulipora sp.	0.67	0.40	0.82	0.72	83.83
Cellepora pumicosa	0.67	0.38	0.82	0.67	84.51
Protodorvillea kefersteini	0.67	0.37	0.82	0.66	85.17
Sertularia sp.	0.67	0.36	0.82	0.64	85.81
Flustra foliacea	0.67	0.36	0.83	0.64	86.45
Scalibregma inflatum	0.76	0.35	0.83	0.62	87.07
Rissoa parva	0.93	0.31	0.57	0.55	87.61
NEMATODA sp.	0.77	0.30	0.59	0.54	88.15
Orchomene humilis	1.00	0.28	0.56	0.49	88.64
Thoralus cranchii	0.79	0.27	0.60	0.48	89.12
Aonides oxycephala	0.71	0.27	0.60	0.47	89.60
Eumida sanguinea	0.82	0.26	0.59	0.46	90.06

Group r

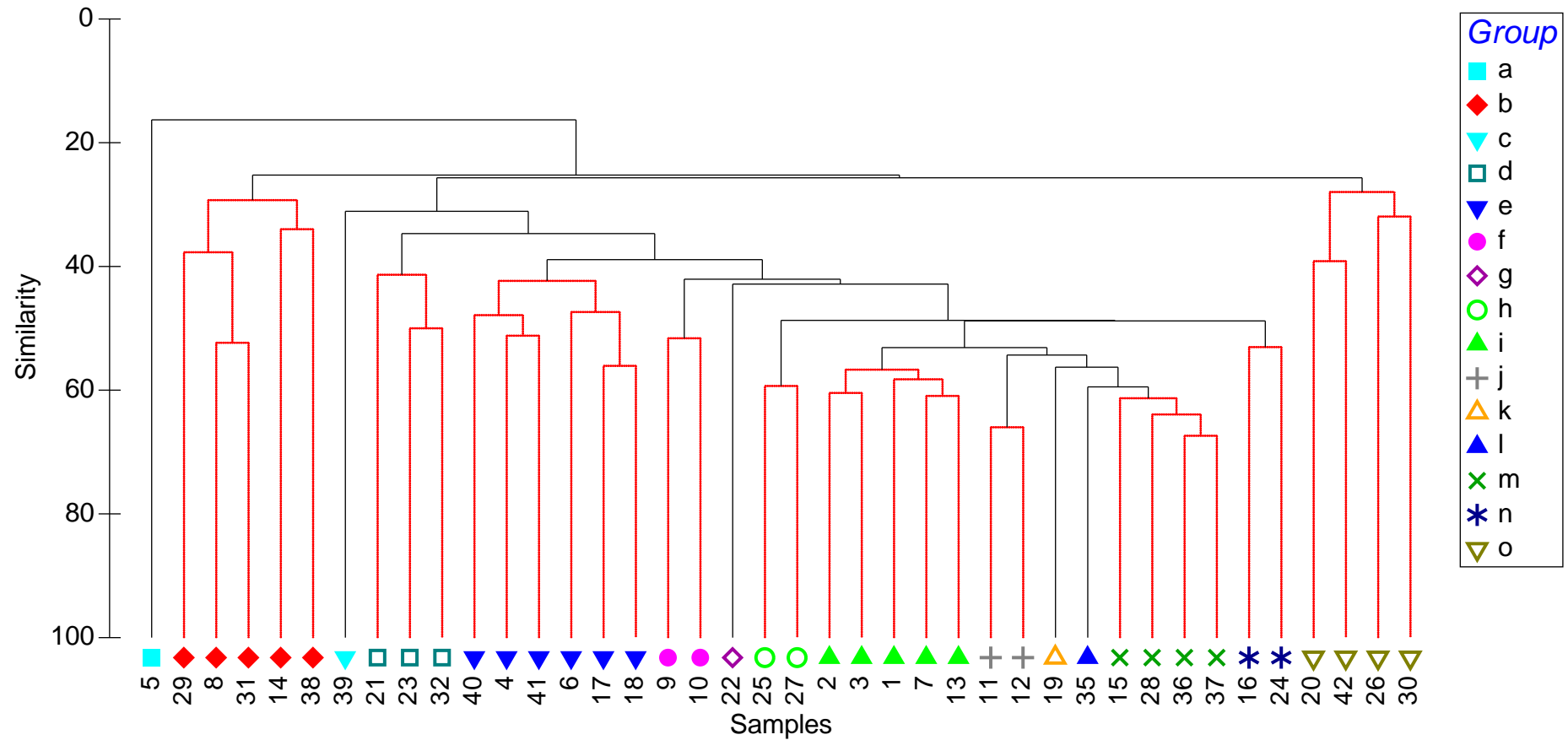
Average similarity: 33.90

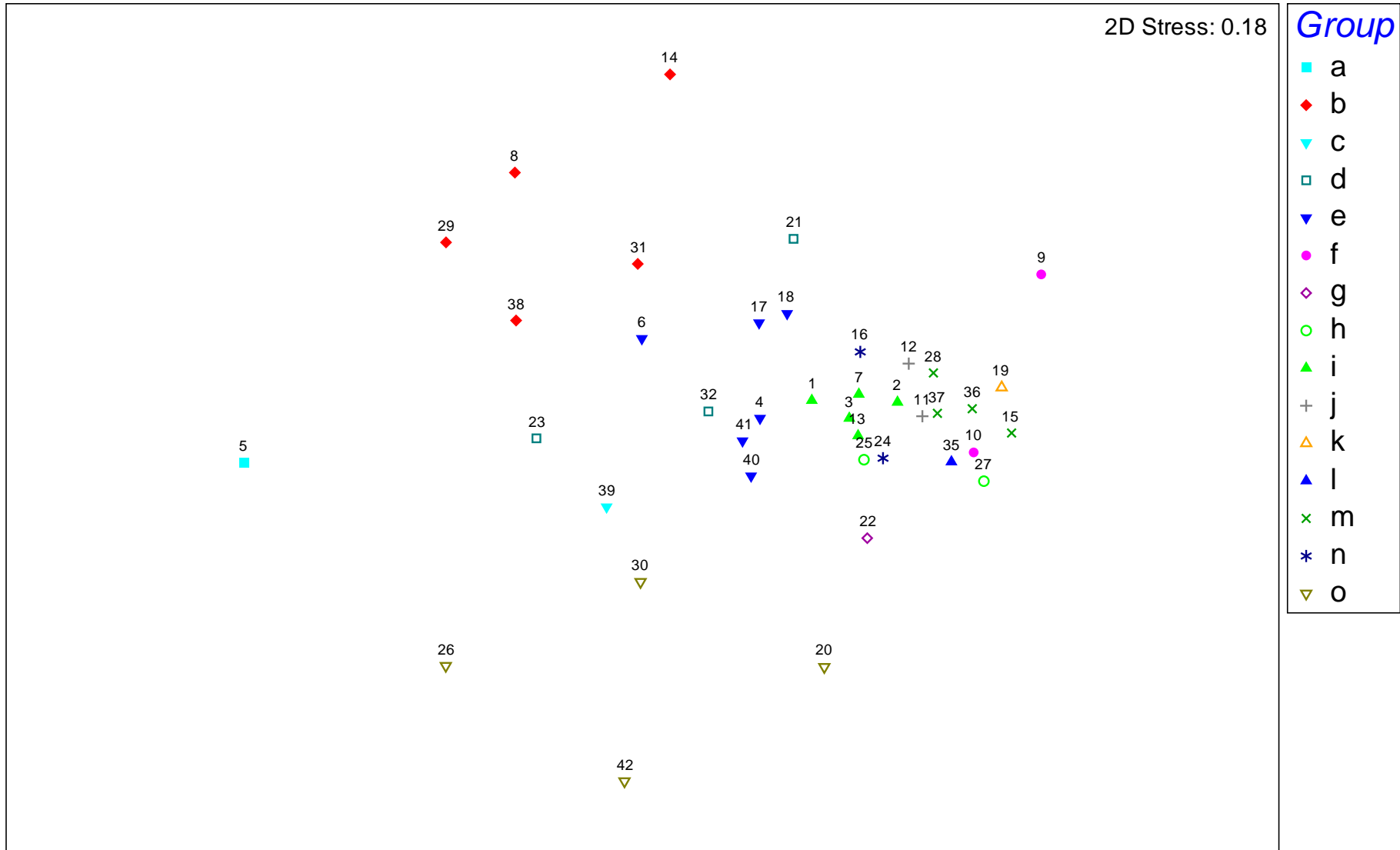
Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Alcyonidium diaphanum	1.00	3.26	5.26	9.62	9.62
NEMERTEA sp.	1.22	2.75	1.83	8.11	17.72
Glycera lapidum agg.	1.22	2.54	1.17	7.51	25.23
Spio armata agg.	1.14	2.16	1.22	6.38	31.60
Scrupocellaria scruposa	0.80	2.03	1.20	5.98	37.59
Crisia sp.	0.80	1.84	1.24	5.43	43.01
Electra pilosa	0.70	1.54	0.89	4.54	47.55
Amphipholis squamata	1.11	1.53	0.64	4.50	52.05
Polycirrus sp.	0.81	1.52	0.87	4.48	56.53
Amathia lendigera	0.70	1.50	0.89	4.41	60.95
Galathea intermedia	0.74	1.08	0.68	3.19	64.14
NEMATODA sp.	1.01	0.98	0.49	2.90	67.03
Sertularia sp.	0.60	0.96	0.69	2.84	69.87
Sabellaria spinulosa	0.57	0.77	0.52	2.27	72.14
Gibbula tumida	0.66	0.71	0.52	2.09	74.24

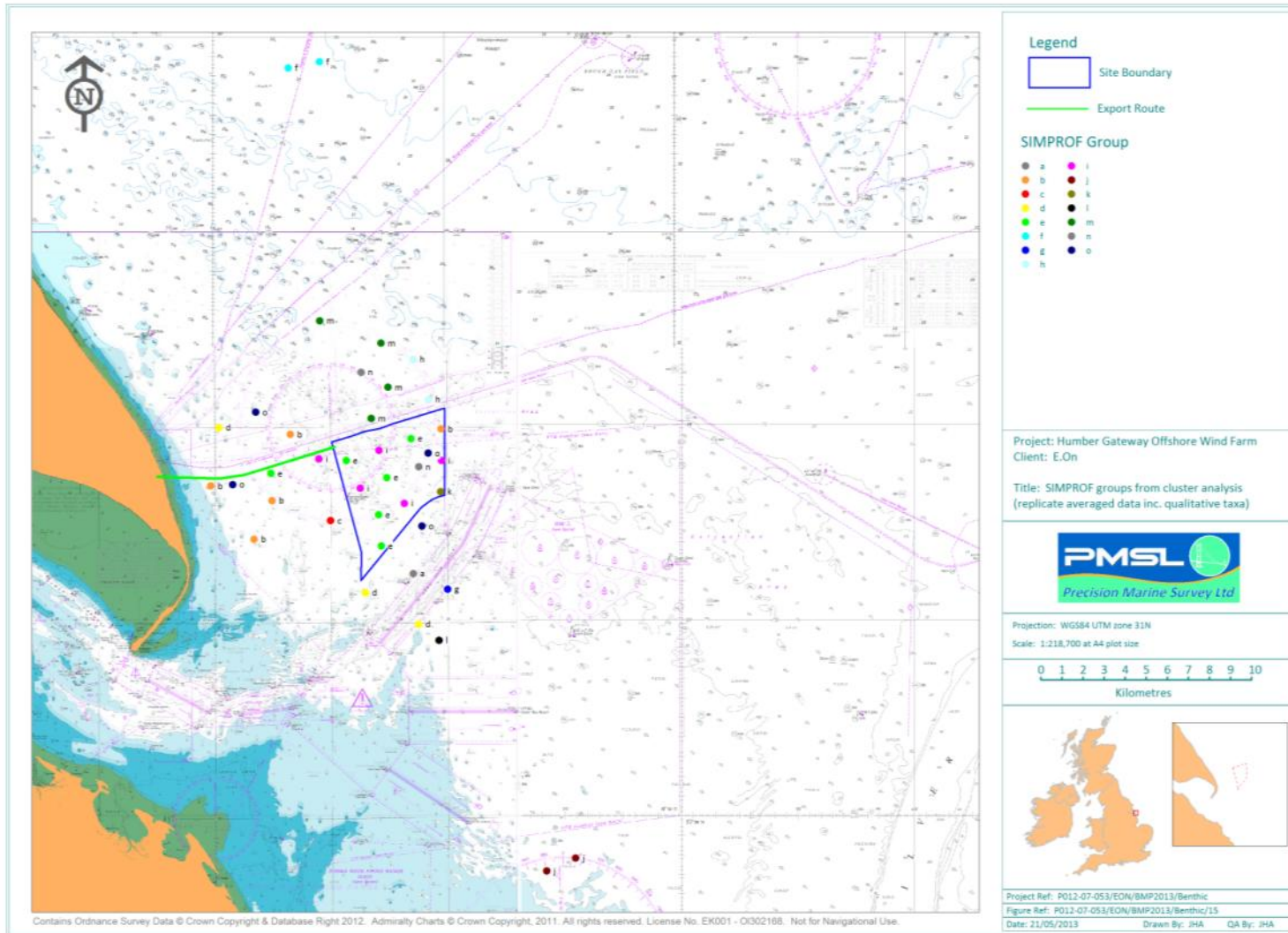
Escharella immersa	0.50	0.71	0.53	2.08	76.32
Thoralus cranchii	0.80	0.69	0.38	2.05	78.37
Pholoe baltica	0.54	0.69	0.51	2.04	80.41
Pisidia longicornis	0.74	0.67	0.52	1.99	82.40
Chone sp.	0.90	0.51	0.37	1.50	83.90
Callopora sp.	0.40	0.36	0.38	1.08	84.98
Crisidia cornuta	0.40	0.36	0.38	1.07	86.04
Balanus crenatus	0.40	0.36	0.38	1.05	87.09
Schizomavella sp.	0.40	0.35	0.38	1.04	88.13
Harmothoe impar	0.34	0.28	0.26	0.82	88.95
Mediomastus fragilis	0.41	0.23	0.26	0.69	89.64
Cheirocratus sp. female	0.37	0.23	0.26	0.67	90.31



### Appendix 7 Multivariate analysis incorporating qualitative data (replicate averaged data)









*Group a*

Less than 2 samples in group

*Group b*

Average similarity: 33.72

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Polycirrus sp.	1.11	4.12	4.95	12.21	12.21
Alcyonidium diaphanum	1.00	4.03	6.55	11.96	24.16
Sabellaria spinulosa	1.74	3.24	0.93	9.62	33.79
Glycera lapidum agg.	1.08	2.82	1.08	8.37	42.16
Scrupocellaria scruposa	0.80	2.54	1.13	7.53	49.69
Amathia lendigera	0.80	2.49	1.13	7.38	57.06
Spio armata agg.	0.76	2.25	1.13	6.66	63.73
Amphipholis squamata	1.15	2.04	1.03	6.04	69.77
NEMERTEA sp.	0.80	2.00	1.08	5.92	75.69
Pholoe baltica	0.56	1.19	0.61	3.52	79.21
Dendrodoa grossularia	0.60	1.14	0.62	3.38	82.59
Crisia sp.	0.60	1.01	0.62	3.00	85.58
NEMATODA sp.	0.85	0.89	0.61	2.63	88.22
Sphaerosyllis taylori	0.48	0.45	0.32	1.33	89.54
Electra pilosa	0.40	0.42	0.32	1.23	90.78

*Group c*

Less than 2 samples in group

*Group d*

Average similarity: 44.21

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Sabellaria spinulosa	5.53	9.60	8.93	21.72	21.72
NEMATODA sp.	1.71	2.68	12.36	6.06	27.78
NEMERTEA sp.	1.00	1.89	12.36	4.28	32.06
Achelia echinata	1.00	1.89	12.36	4.28	36.35
Amphipholis squamata	1.14	1.89	12.36	4.28	40.63
Alcyonidium diaphanum	1.00	1.89	12.36	4.28	44.92
Electra pilosa	1.00	1.89	12.36	4.28	49.20
Amphiblestrum auritum	1.00	1.89	12.36	4.28	53.49
Scrupocellaria scruposa	1.00	1.89	12.36	4.28	57.77
Escharella immersa	1.00	1.89	12.36	4.28	62.06
Dendrodoa grossularia	1.00	1.89	12.36	4.28	66.34
Syllis armillaris	0.86	1.38	2.36	3.13	69.47
Golfingia vulgaris vulgaris	1.05	0.97	0.58	2.20	71.67
Polycirrus sp.	1.09	0.95	0.58	2.15	73.82
Spio armata agg.	1.18	0.89	0.58	2.02	75.84
Hiatella arctica	1.37	0.80	0.58	1.82	77.66
Protodorvillea kefersteini	1.27	0.68	0.58	1.53	79.19
Hydrallmania falcata	0.67	0.62	0.58	1.41	80.60
Sertularia sp.	0.67	0.62	0.58	1.41	82.01
Crisia sp.	0.67	0.62	0.58	1.41	83.42
Escharella ventricosa	0.67	0.62	0.58	1.41	84.83
Schizomavella sp.	0.67	0.62	0.58	1.41	86.23
Lepidonotus squamatus	0.80	0.59	0.58	1.32	87.56
Orchomene humilis	0.91	0.59	0.58	1.32	88.88
Balanus crenatus	0.67	0.59	0.58	1.32	90.20

*Group e*

Average similarity: 45.23

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
NEMATODA sp.	2.12	3.66	2.80	8.09	8.09
Spio armata agg.	1.90	3.34	4.05	7.38	15.48
Amphipholis squamata	1.68	2.73	4.60	6.03	21.51
Leptochiton asellus	1.42	2.44	4.23	5.40	26.91
Galathea intermedia	1.53	2.29	2.61	5.07	31.97
Scrupocellaria scruposa	1.00	2.13	7.03	4.70	36.67
Hiatella arctica	1.00	1.79	5.19	3.95	40.62
Gibbula tumida	1.23	1.73	1.26	3.83	44.45
Glycera lapidum agg.	1.11	1.57	1.29	3.48	47.93
Pisidia longicornis	1.47	1.56	1.15	3.46	51.38
Lepidonotus squamatus	0.93	1.54	1.33	3.40	54.78
Harmothoe impar	1.09	1.48	1.31	3.28	58.06
Crisia sp.	0.83	1.41	1.32	3.12	61.18

Alcyonidium diaphanum	0.83	1.41	1.32	3.12	64.29
Amathia lendigera	0.83	1.41	1.32	3.12	67.41
Sertularia sp.	0.83	1.37	1.33	3.04	70.44
Polycirrus sp.	0.98	1.06	1.08	2.34	72.79
NEMERTEA sp.	1.01	0.89	0.74	1.96	74.75
Aonides paucibranchiata	0.72	0.77	0.78	1.71	76.46
Achelia echinata	0.96	0.72	0.67	1.59	78.05
Sabellaria spinulosa	0.60	0.69	0.70	1.52	79.56
Ophiopholis aculeata	1.13	0.64	0.41	1.40	80.97
Golfingia vulgaris vulgaris	0.60	0.60	0.72	1.33	82.30
Polynoidea sp.	0.47	0.44	0.48	0.97	83.28
Crisidia cornuta	0.50	0.42	0.48	0.93	84.21
Verruca stroemi	0.50	0.40	0.48	0.89	85.10
Tubulipora sp.	0.50	0.40	0.48	0.89	85.98
Escharella immersa	0.50	0.40	0.48	0.89	86.87
Phaeostachys spinifera	0.50	0.40	0.48	0.89	87.76
Cellepora pumicosa	0.50	0.38	0.48	0.84	88.60
Dendrodoa grossularia	0.50	0.36	0.48	0.80	89.40
Ophiothrix fragilis	0.50	0.33	0.47	0.73	90.13

*Group f*

Average similarity: 51.60

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Chone sp.	2.65	2.15	#####	4.17	4.17
Mediomastus fragilis	2.38	1.76	#####	3.41	7.58
Leptochiton asellus	1.99	1.76	#####	3.41	10.99
Spirobranchus triqueter	1.93	1.57	#####	3.05	14.03
Melinna elisabethae	2.18	1.47	#####	2.85	16.88
Hydroides norvegica	1.34	1.11	#####	2.15	19.04
Achelia echinata	1.34	1.11	#####	2.15	21.19
Timoclea ovata	1.39	1.11	#####	2.15	23.35
NEMERTEA sp.	1.79	0.96	#####	1.87	25.21
Galathea intermedia	1.46	0.96	#####	1.87	27.08
Amphipholis squamata	1.37	0.96	#####	1.87	28.95
Halecium sp.	1.00	0.96	#####	1.87	30.81
Sertularia sp.	1.00	0.96	#####	1.87	32.68
Verruca stroemi	1.00	0.96	#####	1.87	34.54
Crisidia cornuta	1.00	0.96	#####	1.87	36.41
Crisia sp.	1.00	0.96	#####	1.87	38.28
Tubulipora sp.	1.00	0.96	#####	1.87	40.14
Amathia lendigera	1.00	0.96	#####	1.87	42.01
Bugula flabellata	1.00	0.96	#####	1.87	43.87
Bicellariella ciliata	1.00	0.96	#####	1.87	45.74
Scrupocellaria scruposa	1.00	0.96	#####	1.87	47.61
Escharella ventricosa	1.00	0.96	#####	1.87	49.47
Schizomavella sp.	1.00	0.96	#####	1.87	51.34
Microporella ciliata	1.00	0.96	#####	1.87	53.21
Didemnidae sp.	1.00	0.96	#####	1.87	55.07
Dendrodoa grossularia	1.00	0.96	#####	1.87	56.94
Harmothoe impar	0.82	0.79	#####	1.52	58.46
Lepidonotus squamatus	0.82	0.79	#####	1.52	59.98
Pholoe baltica	1.22	0.79	#####	1.52	61.51
Glycera lapidum agg.	1.05	0.79	#####	1.52	63.03
Galatowenia oculata	1.17	0.79	#####	1.52	64.56
Ampelisca spinipes	0.99	0.79	#####	1.52	66.08
Cheirocratus sp. female	0.99	0.79	#####	1.52	67.60
Ebalia tuberosa	0.82	0.79	#####	1.52	69.13
Onchidorididae sp.	0.99	0.79	#####	1.52	70.65
Nucula nucleus	0.99	0.79	#####	1.52	72.17
Nuculana minuta	0.82	0.79	#####	1.52	73.70
Abra alba	0.91	0.79	#####	1.52	75.22
Harmothoe fragilis	0.79	0.56	#####	1.08	76.30
Eteone longa agg.	0.58	0.56	#####	1.08	77.38
Sphaerosyllis taylori	0.58	0.56	#####	1.08	78.45
Nephtys caeca	0.70	0.56	#####	1.08	79.53
Lumbrineris cingulata	1.05	0.56	#####	1.08	80.61
Scoloplos armiger	0.58	0.56	#####	1.08	81.68
Aonides paucibranchiata	0.79	0.56	#####	1.08	82.76
Laonice sp. juv.	0.58	0.56	#####	1.08	83.84
Prionospio sp.	0.58	0.56	#####	1.08	84.92
Spio armata agg.	0.58	0.56	#####	1.08	85.99

Caulerliella alata	0.79	0.56	#####	1.08	87.07
Caulerliella zetlandica	1.05	0.56	#####	1.08	88.15
Clymenura sp.	1.00	0.56	#####	1.08	89.23
Scalibregma inflatum	0.58	0.56	#####	1.08	90.30

**Group g**

Less than 2 samples in group

**Group h**

Average similarity: 59.31

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	5.44	4.84	#####	8.16	8.16
Amphipholis squamata	2.55	3.42	#####	5.77	13.93
Aonides oxycephala	1.73	2.42	#####	4.08	18.01
Mediomastus fragilis	1.87	2.42	#####	4.08	22.09
Pholoe baltica	1.57	1.98	#####	3.33	25.42
Glycera lapidum agg.	1.57	1.98	#####	3.33	28.75
Galathea intermedia	3.05	1.98	#####	3.33	32.09
Onoba semicostata	1.83	1.98	#####	3.33	35.42
Abra alba	2.03	1.98	#####	3.33	38.75
NEMATODA sp.	1.21	1.40	#####	2.36	41.11
Lepidonotus squamatus	1.62	1.40	#####	2.36	43.46
Syllis columbretensis	1.21	1.40	#####	2.36	45.82
Caulerliella alata	1.00	1.40	#####	2.36	48.17
Scalibregma celticum	1.72	1.40	#####	2.36	50.53
Achelia echinata	1.21	1.40	#####	2.36	52.88
Gnathia dentata	1.00	1.40	#####	2.36	55.24
Thoralus cranchii	2.08	1.40	#####	2.36	57.60
Gibbula tumida	1.50	1.40	#####	2.36	59.95
Hemilepton nitidum	1.00	1.40	#####	2.36	62.31
Kurtiella bidentata	1.21	1.40	#####	2.36	64.66
Hiatella arctica	1.72	1.40	#####	2.36	67.02
Verruca stroemi	1.00	1.40	#####	2.36	69.37
Balanus crenatus	1.00	1.40	#####	2.36	71.73
Crisidia cornuta	1.00	1.40	#####	2.36	74.09
Crisia sp.	1.00	1.40	#####	2.36	76.44
Tubulipora sp.	1.00	1.40	#####	2.36	78.80
Vesicularia spinosa	1.00	1.40	#####	2.36	81.15
Amathia lendigera	1.00	1.40	#####	2.36	83.51
Flustra foliacea	1.00	1.40	#####	2.36	85.87
Callopora sp.	1.00	1.40	#####	2.36	88.22
Scrupocellaria scruposa	1.00	1.40	#####	2.36	90.58

**Group i**

Average similarity: 57.79

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	4.21	3.01	2.89	5.22	5.22
Spio armata agg.	2.27	2.11	6.10	3.65	8.87
Amphipholis squamata	2.22	2.07	12.46	3.57	12.44
NEMATODA sp.	2.14	1.49	1.67	2.57	15.01
Pholoe baltica	1.64	1.45	4.25	2.51	17.52
Galathea intermedia	1.70	1.31	3.70	2.26	19.78
Leptochiton asellus	1.35	1.20	3.76	2.07	21.85
Gibbula tumida	1.45	1.20	3.54	2.07	23.92
Glycera lapidum agg.	1.23	1.18	10.47	2.05	25.97
Harmothoe impar	1.24	1.17	16.12	2.02	27.99
Lepidonotus squamatus	1.34	1.17	3.04	2.02	30.01
Onoba semicostata	1.97	1.14	1.73	1.97	31.99
NEMERTEA sp.	1.30	1.11	4.63	1.92	33.91
Hiatella arctica	1.14	1.10	12.19	1.90	35.82
Balanus crenatus	1.00	1.07	25.96	1.85	37.67
Crisia sp.	1.00	1.07	25.96	1.85	39.52
Tubulipora sp.	1.00	1.07	25.96	1.85	41.37
Alcyonidium diaphanum	1.00	1.07	25.96	1.85	43.23
Callopora sp.	1.00	1.07	25.96	1.85	45.08
Scrupocellaria scruposa	1.00	1.07	25.96	1.85	46.93
Escharella immersa	1.00	1.07	25.96	1.85	48.79
Phaeostachys spinifera	1.00	1.07	25.96	1.85	50.64
Schizomavella sp.	1.00	1.07	25.96	1.85	52.49
Dendrodoa grossularia	1.00	1.07	25.96	1.85	54.34



Polycirrus sp.	1.15	1.05	3.46	1.81	56.15
Syllis columbretensis	1.37	1.03	2.04	1.78	57.94
Sabellaria spinulosa	1.30	0.99	2.12	1.72	59.66
Modiolus juv.	0.95	0.89	17.34	1.54	61.20
Achelia echinata	1.50	0.88	1.04	1.53	62.73
Polynoidae sp.	1.10	0.85	2.77	1.47	64.21
Syllis armillaris	1.14	0.81	2.55	1.40	65.60
Eteone longa agg.	0.83	0.71	4.41	1.24	66.84
Manzonina crassa	1.07	0.71	4.42	1.23	68.07
Orchomene humilis	1.18	0.70	4.84	1.21	69.28
Mediomastus fragilis	1.10	0.69	1.14	1.19	70.47
Sertularia sp.	0.80	0.64	1.16	1.11	71.58
Electra pilosa	0.80	0.64	1.16	1.11	72.69
Amphiblestrum auritum	0.80	0.64	1.16	1.11	73.80
Turbicellepora avicularis	0.80	0.64	1.16	1.11	74.91
Verruca stroemi	0.80	0.64	1.16	1.10	76.01
Microporella ciliata	0.80	0.64	1.16	1.10	77.11
Crisidia cornuta	0.80	0.63	1.16	1.09	78.20
Amathia lendigera	0.80	0.63	1.16	1.09	79.30
Gibbula cineraria	0.89	0.58	1.15	1.01	80.30
Aonides oxycephala	0.89	0.54	1.16	0.93	81.23
Ophiopholis aculeata	1.11	0.50	1.06	0.86	82.10
Aonides paucibranchiata	0.74	0.48	1.09	0.83	82.93
Ophiothrix fragilis	0.68	0.48	1.09	0.83	83.76
Thoralus cranchii	0.83	0.44	1.04	0.77	84.53
Scalibregma celticum	0.66	0.41	1.09	0.71	85.24
Callipallene brevisrostris	0.66	0.41	1.10	0.71	85.94
Goffingia vulgaris vulgaris	0.60	0.37	1.16	0.64	86.58
Caulerliella alata	0.55	0.36	1.16	0.63	87.21
Escharoides coccinea	0.60	0.32	0.62	0.55	87.76
Cellepora pumicosa	0.60	0.32	0.62	0.55	88.31
Flustra foliacea	0.60	0.31	0.62	0.54	88.85
Cheirocratus sp. female	0.63	0.29	0.61	0.51	89.35
Musculus discors juv.	0.78	0.21	0.61	0.37	89.72
Mya arenaria	0.48	0.21	0.61	0.36	90.09

*Group j*

Average similarity: 65.99

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Sabellaria spinulosa	5.75	4.83	#####	7.32	7.32
Pisidia longicornis	5.21	4.33	#####	6.56	13.88
Melinna elisabethae	2.48	2.09	#####	3.17	17.05
Mediomastus fragilis	2.38	1.75	#####	2.66	19.71
Onoba semicostata	2.15	1.68	#####	2.55	22.25
Gibbula tumida	1.91	1.52	#####	2.30	24.56
Spirobranchus lamarcki	2.07	1.43	#####	2.17	26.73
Achelia echinata	1.68	1.43	#####	2.17	28.90
Amphipholis squamata	1.90	1.43	#####	2.17	31.07
Nucula nucleus	2.32	1.34	#####	2.03	33.10
NEMERTEA sp.	1.62	1.24	#####	1.88	34.98
Protodorvillea kefersteini	1.79	1.24	#####	1.88	36.86
Cirriformia tentaculata	1.47	1.24	#####	1.88	38.74
Rissoa parva	2.62	1.13	#####	1.72	40.46
NEMATODA sp.	1.22	1.01	#####	1.54	41.99
Eteone longa agg.	1.15	1.01	#####	1.54	43.53
Sphaerosyllis taylori	1.39	1.01	#####	1.54	45.06
Spio armata agg.	1.39	1.01	#####	1.54	46.60
Scalibregma inflatum	1.15	1.01	#####	1.54	48.13
Abra alba	1.84	1.01	#####	1.54	49.67
Harmothoe impar	1.50	0.88	#####	1.33	51.00
Laonice bahusiensis	1.08	0.88	#####	1.33	52.33
Scalibregma celticum	1.15	0.88	#####	1.33	53.66
Manzonina crassa	1.37	0.88	#####	1.33	54.99
Ophiothrix sp. juv.	1.00	0.88	#####	1.33	56.32
Sertularia sp.	1.00	0.88	#####	1.33	57.65
Verruca stroemi	1.00	0.88	#####	1.33	58.98
Crisia sp.	1.00	0.88	#####	1.33	60.31
Alcyonidium diaphanum	1.00	0.88	#####	1.33	61.64
Amathia lendigera	1.00	0.88	#####	1.33	62.97
Flustra foliacea	1.00	0.88	#####	1.33	64.30
Amphiblestrum auritum	1.00	0.88	#####	1.33	65.63

Scrupocellaria scruposa	1.00	0.88	#####	1.33	66.96
Escharoides coccinea	1.00	0.88	#####	1.33	68.29
Escharella immersa	1.00	0.88	#####	1.33	69.61
Schizomavella sp.	1.00	0.88	#####	1.33	70.94
Dendrodoa grossularia	1.00	0.88	#####	1.33	72.27
Molgula sp.	1.00	0.88	#####	1.33	73.60
Harmothoe sp.	0.99	0.72	#####	1.09	74.69
Lepidonotus squamatus	1.17	0.72	#####	1.09	75.78
Eteone foliosa	0.82	0.72	#####	1.09	76.86
Syllis columbretensis	1.27	0.72	#####	1.09	77.95
Syllis armillaris	1.05	0.72	#####	1.09	79.03
Eunereis longissima	1.17	0.72	#####	1.09	80.12
Lumbrineris cingulata	0.99	0.72	#####	1.09	81.20
Notomastus sp.	1.12	0.72	#####	1.09	82.29
Polycirrus sp.	1.05	0.72	#####	1.09	83.37
Cheirocratus sp. female	1.05	0.72	#####	1.09	84.46
Galathea intermedia	0.91	0.72	#####	1.09	85.55
Nuculana minuta	0.99	0.72	#####	1.09	86.63
Phoronis sp.	0.91	0.72	#####	1.09	87.72
Pholoe inornata	1.00	0.51	#####	0.77	88.48
Glycera lapidum agg.	0.87	0.51	#####	0.77	89.25
Syllis garciai	0.70	0.51	#####	0.77	90.02

*Group k*

Less than 2 samples in group

*Group l*

Less than 2 samples in group

*Group m*

Average similarity: 63.18

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	7.37	5.83	15.58	9.23	9.23
Achelia echinata	4.03	2.89	5.51	4.57	13.80
Amphipholis squamata	3.10	2.27	8.98	3.60	17.40
Onoba semicostata	2.80	1.87	7.27	2.97	20.37
Leptochiton asellus	2.48	1.74	4.90	2.75	23.12
Callipallene brevirostris	2.32	1.63	5.06	2.59	25.71
Harmothoe impar	2.38	1.59	8.60	2.52	28.23
Mediomastus fragilis	2.87	1.59	1.88	2.51	30.74
Nucula nucleus	1.84	1.41	31.73	2.23	32.97
Lepidonotus squamatus	1.93	1.38	12.85	2.18	35.16
Gibbula tumida	1.93	1.37	7.78	2.17	37.32
Musculus discors juv.	1.75	1.24	11.64	1.96	39.28
Galathea intermedia	1.78	1.21	3.53	1.91	41.19
Caulierella alata	1.47	1.15	33.44	1.83	43.02
Pholoe baltica	1.66	1.12	2.81	1.77	44.79
Hiatella arctica	2.15	1.04	0.90	1.65	46.44
Nuculana minuta	1.36	0.94	7.02	1.48	47.92
Spio armata agg.	1.46	0.91	2.72	1.45	49.37
Eumida sanguinea	1.21	0.89	9.62	1.40	50.77
Pholoe inornata	1.22	0.83	12.40	1.31	52.08
Cheirocratus sp. female	1.22	0.83	12.40	1.31	53.39
Scalibregma celticum	1.61	0.82	3.24	1.29	54.68
Verruca stroemi	1.00	0.81	23.31	1.28	55.96
Balanus crenatus	1.00	0.81	23.31	1.28	57.23
Crisidia cornuta	1.00	0.81	23.31	1.28	58.51
Crisia sp.	1.00	0.81	23.31	1.28	59.78
Alcyonidium diaphanum	1.00	0.81	23.31	1.28	61.06
Scrupocellaria scruposa	1.00	0.81	23.31	1.28	62.33
Escharella immersa	1.00	0.81	23.31	1.28	63.61
Dendrodoa grossularia	1.00	0.81	23.31	1.28	64.88
Sabellaria spinulosa	1.70	0.80	0.91	1.26	66.14
Harmothoe sp.	1.48	0.77	0.91	1.21	67.36
Gnathia dentata	1.10	0.76	5.56	1.20	68.55
Rissoa parva	1.44	0.71	2.30	1.12	69.67
Parvicardium ovale	1.21	0.71	2.31	1.12	70.79
Melinna elisabethae	1.36	0.66	0.91	1.04	71.83
Harmothoe extenuata	1.00	0.64	3.07	1.01	72.85
Protodorvillea kefersteini	0.89	0.64	3.24	1.01	73.86

Aonides oxycephala	0.95	0.59	3.49	0.94	74.79
Scalibregma inflatum	0.95	0.59	3.63	0.93	75.72
Mya arenaria	0.89	0.53	3.20	0.83	76.56
Syllis columbretensis	1.12	0.49	0.85	0.78	77.33
Glycera lapidum agg.	1.04	0.47	0.87	0.74	78.07
Aonides paucibranchiata	0.96	0.47	0.87	0.74	78.81
Abra alba	1.16	0.45	0.90	0.71	79.52
Manzonina crassa	0.93	0.43	0.90	0.69	80.20
NEMERTEA sp.	0.93	0.43	0.90	0.68	80.89
Thoralus cranchii	0.93	0.43	0.90	0.68	81.57
Hemilepton nitidum	0.98	0.43	0.90	0.68	82.25
Munna minuta	0.79	0.42	0.91	0.66	82.91
Plumulariidae sp.	0.75	0.42	0.91	0.66	83.57
Flustra foliacea	0.75	0.42	0.91	0.66	84.22
Cellepora pumicosa	0.75	0.41	0.91	0.65	84.87
Tubulipora sp.	0.75	0.39	0.91	0.62	85.49
Schizomavella sp.	0.75	0.39	0.91	0.62	86.12
Hinia incrassata	0.79	0.39	0.91	0.62	86.74
Sertularia sp.	0.75	0.39	0.91	0.62	87.37
Amathia lendigera	0.75	0.39	0.91	0.62	87.99
Callopora sp.	0.75	0.39	0.91	0.62	88.61
Molgula sp.	0.75	0.39	0.91	0.62	89.24
Eteone longa agg.	0.85	0.37	0.89	0.58	89.82
Ebalia tuberosa	0.81	0.35	0.90	0.55	90.37

Group n  
Average similarity: 53.02

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Pisidia longicornis	2.74	3.80	#####	7.18	7.18
Lepidonotus squamatus	1.87	2.49	#####	4.70	11.87
Pholoe baltica	1.87	2.49	#####	4.70	16.57
Spio armata agg.	2.28	2.49	#####	4.70	21.27
Achelia echinata	1.73	2.49	#####	4.70	25.97
Gibbula tumida	1.73	2.49	#####	4.70	30.67
Onoba semicostata	1.87	2.49	#####	4.70	35.37
Galathea intermedia	1.83	2.03	#####	3.84	39.20
Phoronis sp.	1.41	2.03	#####	3.84	43.04
NEMERTEA sp.	1.21	1.44	#####	2.71	45.75
Harmothoe sp.	1.21	1.44	#####	2.71	48.46
Glycera lapidum agg.	1.37	1.44	#####	2.71	51.18
Caulerliella alata	1.00	1.44	#####	2.71	53.89
Mediomastus fragilis	1.21	1.44	#####	2.71	56.60
Melinna elisabethae	1.50	1.44	#####	2.71	59.31
Polycirrus sp.	1.21	1.44	#####	2.71	62.03
Leptochiton asellus	1.62	1.44	#####	2.71	64.74
Nucula nucleus	1.21	1.44	#####	2.71	67.45
Ophiopholis aculeata	2.62	1.44	#####	2.71	70.16
Amphipholis squamata	1.37	1.44	#####	2.71	72.88
Verruca stroemi	1.00	1.44	#####	2.71	75.59
Crisidia cornuta	1.00	1.44	#####	2.71	78.30
Crisia sp.	1.00	1.44	#####	2.71	81.01
Tubulipora sp.	1.00	1.44	#####	2.71	83.73
Alcyonidium diaphanum	1.00	1.44	#####	2.71	86.44
Callopora sp.	1.00	1.44	#####	2.71	89.15
Scrupocellaria scruposa	1.00	1.44	#####	2.71	91.86

Group o  
Average similarity: 30.46

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Crisia sp.	1.00	4.35	4.95	14.26	14.26
Scrupocellaria scruposa	1.00	4.35	4.95	14.26	28.53
Dendrodoa grossularia	1.00	4.35	4.95	14.26	42.79
Tubulipora sp.	0.75	2.41	0.89	7.91	50.70
Escharella ventricosa	0.75	2.37	0.89	7.78	58.48
Balanus crenatus	0.75	1.87	0.91	6.13	64.61
Bicellariella ciliata	0.75	1.87	0.91	6.13	70.74
Rissoa parva	1.00	1.30	0.41	4.28	75.02
Sertularia sp.	0.50	0.98	0.41	3.22	78.24
Glycera lapidum agg.	0.75	0.76	0.41	2.49	80.73
Polycirrus sp.	0.68	0.76	0.41	2.49	83.23





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Technical Appendix – Benthic Survey Results  
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Electra pilosa	0.50	0.76	0.41	2.49	85.72
Leptochiton asellus	0.50	0.74	0.41	2.43	88.14
Phaeostachys spinifera	0.50	0.67	0.41	2.19	90.34