Subtidal Benthic Investigations of the Greater Codling Bank

Produced by

AQUAFACT International Services Ltd

On behalf of

The National Parks & Wildlife Service

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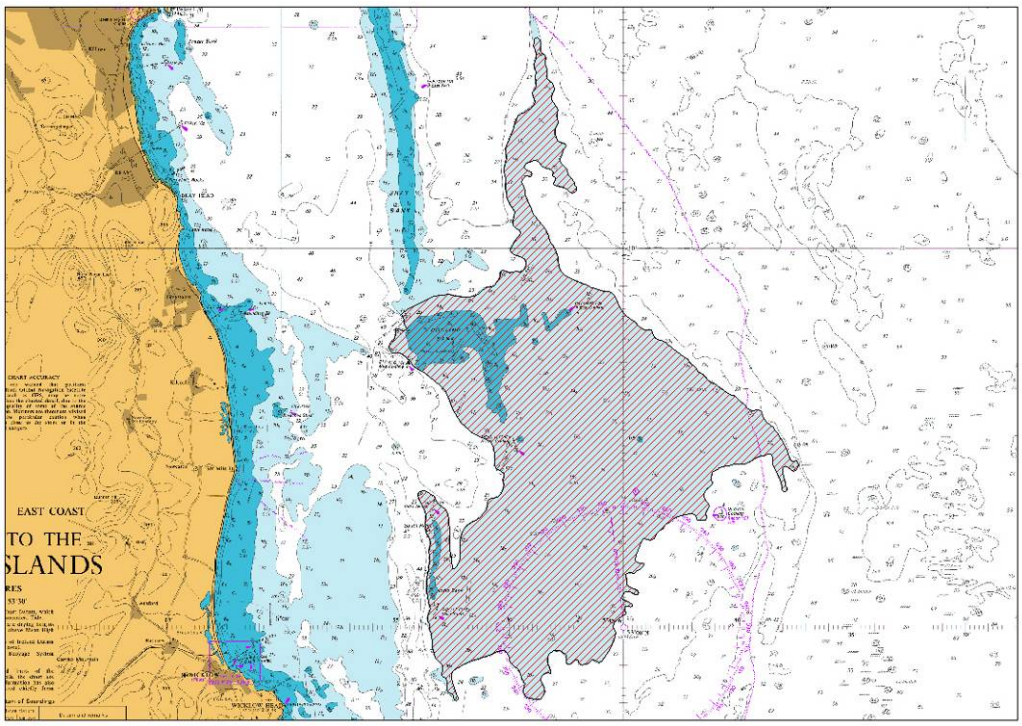

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1. Executive Summary

AQUAFACT sampled the Greater Codling Bank on the 17th and 18th of July 2012.

Forty grab stations were surveyed. All stations were sampled for fauna (which were sieved on a 1mm mesh sieve), granulometry and organic carbon. A faunal sample could not be retrieved from stations Cod -27, Cod – 28 and Cod - 30 due to hard ground.

A gravelly / cobbly seabed dominated the Greater Codling Bank. Where finer substrates were encountered they ranged from medium sand in the north to gravelly sands in the northeastern and southwestern areas. Sandy gravel pockets dominated in amongst the gravel and cobble beds. Isolated areas of bedrock were encountered in the shallower regions mainly over the Codling Bank in the northwesern part of the Greater Codling Bank. Organic content levels were low as expected given the coarse and sandy nature of the seabed.

Eight different faunal groupings were identified from the Greater Codling Bank. Given the range in sediment types across the bank, the fauna present was a mixture of both infaunal and epifaunal taxa. All of the species present are typical of such coarse gravelly and sandy sediments, where current speeds and sediment mobility area high. A species of note is the reef forming polychaete *Sabellaria spinulosa*. Reefs formed by this species are protected under OSPAR. While individuals were found in very low densities during this survey, further exploration may be required to determine the presence of reefs in this locality.

2. Introduction

AQUAFACT International Services Ltd. was commissioned by the National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaetltacht (DAHG) to carry out a subtidal benthic survey of the Greater Codling Bank. The Greater Codling Bank covers an area of 230km^2. It is approximately 32.4km from the most northerly to most southerly tip and approximately 20.8km from the most easterly to westerly tip. The southern tip is located approximately 8.3km east-northeast of Wicklow Head, Co. Wicklow and the northern tip is located approximately 17.6km east-southeast of Dalkey Island, Co. Dublin. Figure 2.1 shows the location of the Greater Codling Bank.

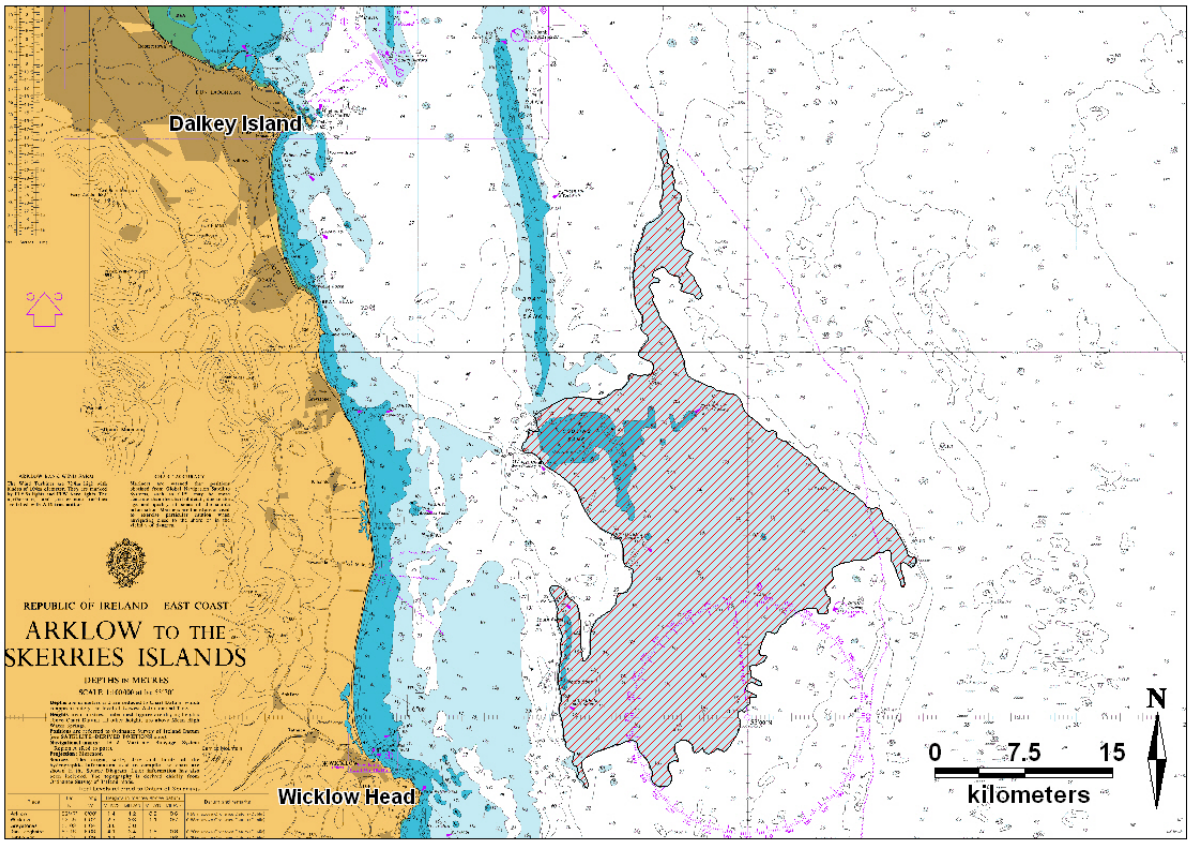


Figure 2.1: Location of the Greater Codling Bank

3. Materials & Methods

3.1. Sampling Procedure

To carry out the subtidal benthic assessment of the Greater Codling Bank, AQUAFACT sampled a total of 40 stations. Sampling took place on the 17th and 18th July 2012 from the *MV Sharpshooter*. The weather on the first day was dry with a westerly (turning southwesterly during the day) Force 3-4 breeze, with wave heights of 1-2m. On the 18th, winds were much slacker, a light southwesterly Force 2-3 breeze with wave heights of 0.5m. All stations sampled can be seen in Figure 3.1 and their locations were selected in order to give as broad a coverage of the bank as possible. Table 3.1 shows the station coordinates and depths. Please note that due to a variation in substrate type encountered at Station 24, two samples were retained from this site (labelled 24a and 24b).

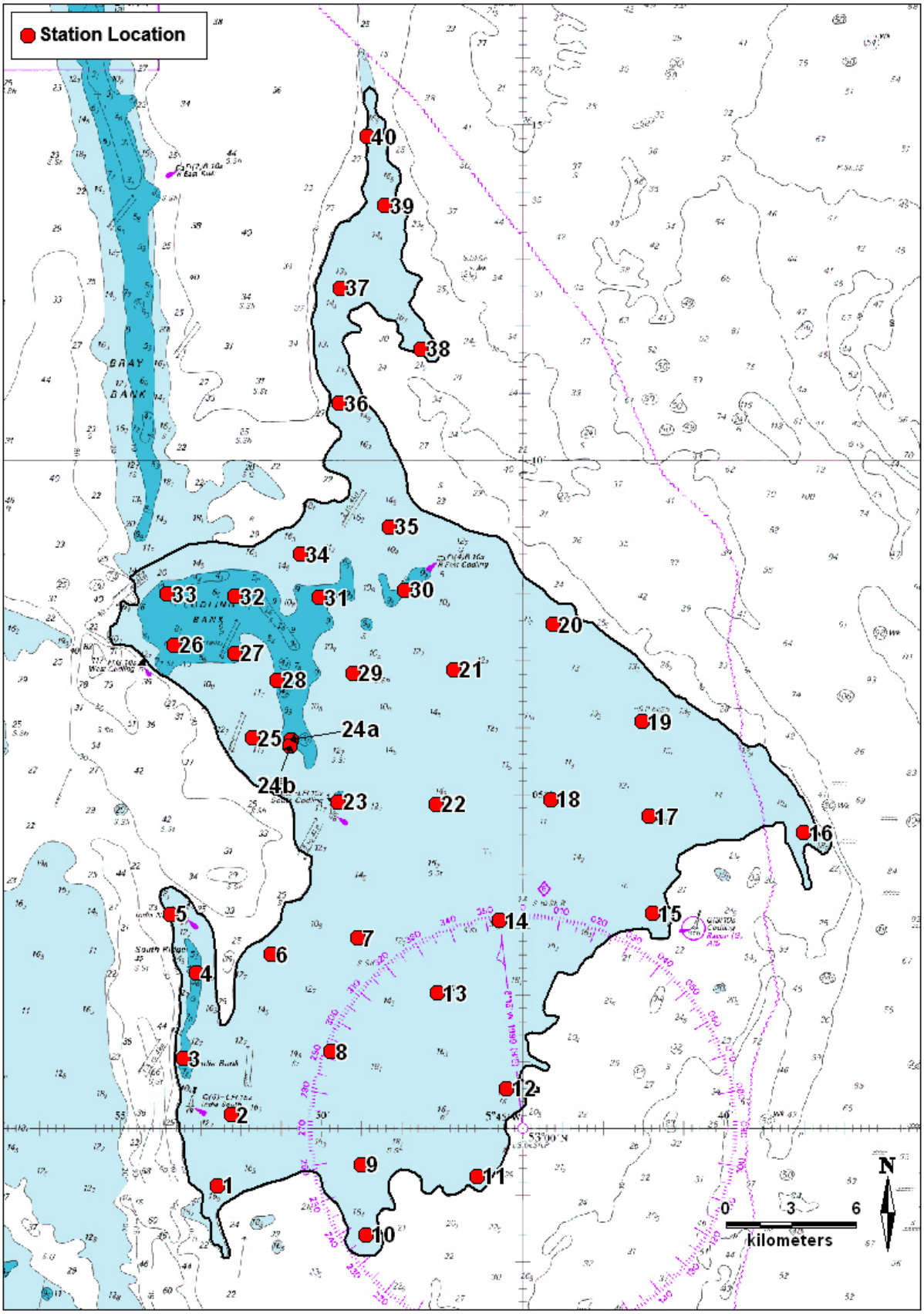


Figure 3.1: Location of all stations sampled on the 17th and 18th July 2012.

Table 3.1: Station coordinates and depths.

Station	Longitude	Latitude	Easting (ING)	Northing (ING)	Depth (m)
1	-5.8784	52.98593	342461.8	194900.7	19.6
2	-5.87245	53.00353	342803.2	196870.6	16.6
3	-5.89232	53.01765	341423.7	198401.8	14.4
4	-5.88702	53.039	341709.3	200787.6	7.6
5	-5.89742	53.05367	340964	202398.9	25.4
6	-5.85587	53.04358	343782.8	201359.5	21.2
7	-5.81995	53.04763	346177.4	201882.7	16.1
8	-5.83093	53.01935	345536.2	198713.8	19.1
9	-5.81877	52.9912	346447.7	195606.7	20.1
10	-5.81658	52.97353	346654.1	193645.7	19.4
11	-5.77037	52.98823	349707.1	195376.6	24.3
12	-5.75852	53.01008	350426.6	197832.2	22.4
13	-5.787	53.03395	348433.4	200428.2	19.1
14	-5.76145	53.05205	350084	202495.1	19.3
15	-5.69763	53.05382	354355.7	202827.2	21.5
16	-5.63533	53.07403	358457.5	205212.3	21.3
17	-5.69908	53.07813	354171.6	205529.3	17.6
18	-5.74012	53.08233	351407.8	205909	17.6
19	-5.70203	53.1017	353889.9	208144.9	19.8
20	-5.7388	53.12598	351342.7	210768.1	17.6
21	-5.78033	53.11473	348602.1	209429.5	15.4
22	-5.78737	53.08115	348246.7	205678.6	18.7
23	-5.82842	53.08178	345494.5	205664.9	16.5
24a	-5.84763	53.0971	344156	207330.1	15.5
24b	-5.84823	53.0958	344120.2	207184.3	15.5
25	-5.86348	53.09768	343092.7	207363.2	14.7
26	-5.89593	53.12078	340844.1	209868.9	10
27	-5.87085	53.11877	342529.6	209694.3	11.9
28	-5.85322	53.11207	343732.2	208984.1	9.7
29	-5.82178	53.11388	345830.3	209249.7	13.1
30	-5.8004	53.13455	347191.1	211592.8	13
31	-5.83605	53.13258	344812.4	211301.2	12.5
32	-5.87093	53.13292	342477.2	211268.4	10.3
33	-5.89922	53.13358	340582.5	211286.6	11.8
34	-5.8436	53.14343	344270.9	212493.1	17.3
35	-5.807	53.15025	346696	213325.9	18.1
36	-5.82773	53.18108	345205.1	216714	19.5
37	-5.82732	53.20968	345136.3	219896.9	20.8
38	-5.7937	53.19458	347433.4	218285.6	24.8
39	-5.8088	53.23018	346303.1	222215.4	21.5
40	-5.8163	53.24738	345744	224113.7	24.8

Not all stations were successfully sampled on the first attempt and as a result the grab was re-deployed until either a sample was retrieved or until sufficient evidence of hard ground was established. As a result, in order to sample the 40 stations, the grab was deployed 73 times. The information gathered from the repeated grab attempts gives an appreciation of the small-scale spatial variation in substrate type found along the bank. This additional information and mapping can be seen in Appendix 1.

AQUAFACT has in-house standard operational procedures for benthic sampling and these were followed for this project. Additionally, the recently published MESH report on "Recommended Standard methods and procedures" was adhered to.

A 0.1m^2 Day grab was used to sample the Greater Codling Bank. The grab was initially weighted with 80kg, this was reduced to 40kg as the additional weights were making the recovery of the grab dangerous and causing a strain on the loading gear. On arrival at each sampling station, the vessel location was recorded using DGPS (Lat/Long & ING). Additional information such as date, time, site name, sample code, depth, sampler, anchorage, weather, sea state and exposure were recorded in a data sheet.

One grab sample was to be taken at each station. The grab deployment and recovery rates did not exceed 1 metre/sec and were <0.5 m/sec for the last 5 metres for water depths up to 30m. Upon retrieval of the grab, penetration depth was measured and recorded in the sample data sheet. Only grab samples that contained a depth of >7cm for sand and >10cm for mud were retained. Re-sampling occurred until a sufficient depth of sediment was collected in the grab (the vessel repositioned between grab samples). Where cobbles or gravel was encountered, penetration depths were much shallower. All additional relevant data (sediment type, texture, grain size, colour, odour, layering, volume, presence of fauna, algae, surface features) were recorded in the sample data sheets.

A digital image of each sample (including sample label) was taken and its reference number entered in the sample data sheet. These images can be seen in Appendix 2. The grab sampler was cleaned between stations to prevent cross contamination.

A sediment sample was retrieved from the grab and split into two, one sample for granulometric analysis and one sample for organic carbon. Both samples were placed in plastic sampling bags and

labelled internally and externally. These samples were frozen (<-18ºC) as soon as possible after acquisition.

The remainder of the grab sample was carefully and gently sieved on a 1mm mesh sieve as a sediment water suspension for the retention of fauna. Great care was taken during the sieving process in order to minimise damage to taxa such as spionids, scale worms, phyllodocids and amphipods. The sample residue was carefully flushed into a pre-labelled (internally and externally) container from below. Each label contained the sample code and date. The samples were stained immediately with Eosin-briebrich scarlet and fixed immediately in with 4% w/v buffered formaldehyde solution (10% w/v buffered formaldehyde solution for very organic mud). These samples were ultimately preserved in 70% alcohol upon return to the laboratory.

3.2. Sample Processing

All faunal samples were placed in an illuminated shallow white tray and sorted first by eye to remove large specimens and then sorted under a stereo microscope (x 10 magnification). Following the removal of larger specimens, the samples were placed into Petri dishes, approximately one half teaspoon at a time and sorted using a binocular microscope at x25 magnification.

The fauna was sorted into four main groups: Polychaeta, Mollusca, Crustacea and others. The 'others' group consisted of echinoderms, nematodes, nemerteans, cnidarians and other lesser phyla. The fauna were maintained in stabilised 70% industrial methylated spirit (IMS) following retrieval and identified to species level where practical using a binocular microscope, a compound microscope and all relevant taxonomic keys. After identification and enumeration, specimens were separated and stored to species level.

The sediment granulometric analysis was carried out by AQUAFACT using the traditional granulometric approach. Traditional analysis involved the dry sieving of approximately 100g of sediment using a series of Wentworth graded sieves. The process involved the separation of the sediment fractions by passing them through a series of sieves. Each sieve retained a fraction of the sediment, which were later weighed and a percentage of the total was calculated. Table 3.2 shows the classification of sediment particle size ranges into size classes. Sieves, which corresponded to the range of particle sizes (Table 3.2), were used in the analysis. Refer to Appendix 3 for a detailed methodology of this procedure.

Table 3.2: The classification of sediment particle size ranges into size classes (adapted from Buchanan, 1984)

Range of Particle Size	Classification	Phi Unit
<63µm	Silt/Clay	>4 Ø
63-125 µm	Very Fine Sand	4 Ø, 3.5 Ø
125-250 µm	Fine Sand	3 Ø, 2.5 Ø
250-500 µm	Medium Sand	2 Ø, 1.5 Ø
500-1000 µm	Coarse Sand	1 Ø, 1.5 Ø
1000-2000 µm (1 – 2mm)	Very Coarse Sand	0 Ø, -0.5 Ø
2000 – 4000 µm (2 – 4mm)	Very Fine Gravel	-1 Ø, -1.5 Ø
4000 -8000 µm (4 – 8mm)	Fine Gravel	-2 Ø, -2.5 Ø
8 -64 mm	Medium, Coarse & Very Coarse Gravel	-3 Ø to -5.5 Ø
64 – 256 mm	Cobble	-6 Ø to -7.5 Ø
>256 mm	Boulder	< -8 Ø

Organic carbon analysis was carried out by the OMAC Laboratories using the Loss on Ignition technique outlined in Appendix 3.

3.3. Data Analysis

Statistical evaluation of the data was undertaken using PRIMER v.6 (Plymouth Routines in Ecological Research). Univariate statistics in the form of diversity indices are calculated. Numbers of species and numbers of individuals per sample will be calculated and the following diversity indices will be utilised:

1) Margalef's species richness index (D) (Margalef, 1958),

$$D = \frac{S - 1}{\log_2 N}$$

where: N is the number of individuals

S is the number of species

2) Pielou's Evenness index (J) (Pielou, 1977)

$$J = \frac{H'(observed)}{H'_{max}}$$

where: H'_{max} is the maximum possible diversity, which could be achieved if all

species were equally abundant (= $\log_2 S$)

3) Shannon-Wiener diversity index (H') (Pielou, 1977)

$$H' = -\sum_{i=1}^{S} p_i (\log_2 p_i)$$

where: p_I is the proportion of the total count accounted for by the i^{th} taxa

4) Simpson's Diversity Index (Simpson, 1949)

$$1-\lambda' = 1-\{\Sigma_i N_i(N_i-1)\} / \{N(N-1)\}$$

where N is the number of individuals of species i.

Species richness is a measure of the total number of species present for a given number of individuals. Evenness is a measure of how evenly the individuals are distributed among different species. The Shannon-Wiener index incorporates both species richness and the evenness component of diversity (Shannon & Weaver, 1949) and Simpson's index is a more explicit measure of the latter, i.e. the proportional numerical dominance of species in the sample (Simpson, 1949).

The PRIMER programme (Clarke & Warwick, 2001) was used to carry out multivariate analyses on the station-by-station faunal data. All species/abundance data from the grab surveys was square root transformed and used to prepare a Bray-Curtis similarity matrix in PRIMER ®. The square root transformation was used in order to allow the intermediate abundant species to play a part in the similarity calculation. All species/abundance data from the samples was used to prepare a Bray-Curtis similarity matrix. The similarity matrix was then be used in classification/cluster analysis. The aim of this analysis was to find "natural groupings' of samples, i.e. samples within a group that are more similar to each other, than they are similar to samples in different groups (Clarke & Warwick, *loc. cit.*). The PRIMER programme CLUSTER carried out this analysis by successively fusing the samples into groups and the groups into larger clusters, beginning with the highest mutual similarities then gradually reducing the similarity level at which groups are formed. The result was represented graphically in a dendrogram, the x-axis representing the full set of samples and the y-axis representing similarity levels at which two samples/groups are said to have fused. SIMPROF (Similarity Profile) permutation tests were incorporated into the CLUSTER analysis to identify statistically significant evidence of genuine clusters in samples which are *a priori* unstructured.
The Bray-Curtis similarity matrix was also be subjected to a non-metric multi-dimensional scaling (MDS) algorithm (Kruskal & Wish, 1978), using the PRIMER programme MDS. This programme

produced an ordination, which is a map of the samples in two- or three-dimensions, whereby the placement of samples reflects the similarity of their biological communities, rather than their simple geographical location (Clarke & Warwick, 2001). With regard to stress values, they give an indication of how well the multi-dimensional similarity matrix is represented by the two-dimensional plot. They are calculated by comparing the interpoint distances in the similarity matrix with the corresponding interpoint distances on the 2-d plot. Perfect or near perfect matches are rare in field data, especially in the absence of a single overriding forcing factor such as an organic enrichment gradient. Stress values increase, not only with the reducing dimensionality (lack of clear forcing structure), but also with increasing quantity of data (it is a sum of the squares type regression coefficient). Clarke & Warwick (*loc. cit*.) have provided a classification of the reliability of MDS plots based on stress values, having compiled simulation studies of stress value behaviour and archived empirical data. This classification generally holds well for 2-d ordinations of the type used in this study. Their classification is given below:

- Stress value < 0.05: Excellent representation of the data with no prospect of misinterpretation.
- Stress value < 0.10: Good representation, no real prospect of misinterpretation of overall structure, but very fine detail may be misleading in compact subgroups.
- Stress value < 0.20: This provides a useful 2-d picture, but detail may be misinterpreted particularly nearing 0.20.
- Stress value 0.20 to 0.30: This should be viewed with scepticism, particularly in the upper part of the range, and discarded for a small to moderate number of points such as < 50.
- Stress values > 0.30: The data points are close to being randomly distributed in the 2-d ordination and not representative of the underlying similarity matrix.

Each stress value must be interpreted both in terms of its absolute value and the number of data points. In the case of this study, the moderate number of data points indicates that the stress value can be interpreted more or less directly. While the above classification is arbitrary, it does provide a framework that has proved effective in this type of analysis.

The species, which are responsible for the grouping of samples in cluster and ordination analyses, were identified using the PRIMER programme SIMPER (Clarke & Warwick, 1994). This programme determined the percentage contribution of each species to the dissimilarity/similarity within and between each sample group.

The physical and chemical sedimentological data was used to compile data matrices used for principal component analysis (PCA). The principal components for each site were analysed. Essentially, the contribution that each parameter made to the variance within and between samples was calculated, with the overall aim of identifying the parameter(s), which caused the variance in the original set. Following transformation of the data (granulometric data was arcsin transformed and the LOI data was $\log_{10}$ transformed), the data was normalised and using the Primer® programme PCA (Clarke & Warwick, 1994), a two dimensional PCA plot was produced. Essentially, the PCA plot defines the positions of the sites in relation to each axis, which represents the full set of variables. Each site acquires a place on this graph and the location depends on a number of variables significant to that site and which sets it apart from all the rest. The significant variables, which increase to the right and to the left of axis 1 (PC1), are identified along the x-axis. Similarly, the significant variables, which increase to the top and to the bottom of axis 2 (PC2), are also identified along the y-axis.

BIOENV is a PRIMER programme used to link faunal and environmental data. The premise adopted is that if the suite of environmental variables responsible for structuring a community were known, then samples having rather similar values for these variables would be expected to have rather similar species composition, and an ordination based on this abiotic information would group sites in the same was as for the biotic plot (MDS).

3.4. Voucher Collection

A voucher collection for each major taxon was established by competent, professional taxonomists (See Appendix 4). The same taxonomist was responsible for the identification of all non-voucher specimens. Taxonomic references used in the identification of the voucher series as well as the voucher specimens themselves were available for use during the identification of the general (non-voucher) collections. Voucher series was established for each reported taxon, including those taxa tentatively identified as "Genus A" or "species B". The collection includes a sufficient number of individual specimens (if available) to display all typical intraspecific variability encountered in that taxon for that study area.

4. Results

4.1. Fauna

The taxonomic identification of the benthic infauna across all 41 stations sampled on the Greater Codling Bank yielded a total count of 335 taxa ascribed to 15 phyla. Of the 335 taxa, 33 could not be enumerated due to their colonial nature and the remaining 302 taxa consisted of 8,461 individuals. Of the 335 taxa identified, 188 were identified to species level. The remaining 147 could not be identified to species level for the following reasons: 43 were juveniles, 89 were partial/damaged and 15 were indeterminate. Appendix 5 shows the faunal abundances from the Greater Codling Bank.

Of the 302 taxa enumerated, 125 were annelids (segmented worms), 76 were molluscs (mussels, cockles, snails etc.), 67 were crustaceans (crabs, shrimps, prawns), 12 were tunicates (sea squirts), 11 were echinoderms (brittlestars, sea cucumbers), 3 were chelicerates (sea spider), 2 species were cnidarians (sea anemones, jellyfish, corals etc), 1 was a nemertean (ribbon worm), 1 was a nematode (round worm), 1 was a platyhelminthean (flat worm), 1 was a bryozoan (moss animals), 1 was a phoronid (horseshoe worms) and 1 was a piscean (fish).

Of the 33 colonial species recorded, 20 were bryozoans, 9 were cnidarians, 3 were poriferans (sponges) and 1 was a tunicate. Table 4.1 shows the numbers of species and individuals recorded at each station. The lowest number of taxa returned was 1 at Station Cod - 4 and the highest number returned was 76 at Station Cod - 10. The number of individuals returned ranged from 0 at Station Cod – 4 (due to the fact that the species present was colonial and not enumerated) to 1,079 at Station Cod – 24b.

Table 4.1: Numbers of species and individuals recorded at each station.

Station	No. Taxa	No. Individuals
Cod - 1	23	110
Cod - 2	43	315
Cod - 3	16	78
Cod - 4	1	0
Cod - 5	7	7
Cod - 6	5	3
Cod - 7	58	887
Cod - 8	52	312

Station	No. Taxa	No. Individuals
Cod - 9	66	232
Cod - 10	76	405
Cod - 11	72	544
Cod - 12	75	604
Cod - 13	56	284
Cod - 14	68	612
Cod - 15	64	380
Cod - 16	10	41
Cod - 17	10	19
Cod - 18	16	83
Cod - 19	42	372
Cod - 20	24	209
Cod - 21	29	169
Cod - 22	32	185
Cod - 23	21	54
Cod - 24a	32	81
Cod - 24b	46	1079
Cod - 25	21	59
Cod - 26	32	192
Cod - 27	-	-
Cod - 28	-	-
Cod - 29	34	144
Cod - 30	-	-
Cod - 31	38	207
Cod - 32	28	114
Cod - 33	19	79
Cod - 34	48	505
Cod - 35	8	20
Cod - 36	5	8
Cod - 37	3	16
Cod - 38	6	11
Cod - 39	9	21
Cod - 40	10	20

4.1.1. Univariate Analysis

The following taxa were removed prior to statistical analyses: nematodes, nemerteans and meiofaunal copepods, all species not identifed to species level (juveniles, partial/damaged and indeterminate) and all colonial species unable to be enumerated. In addition, stations Cod – 27. Cod -28 and Cod – 30 were removed as these sites were unsampleable and station Cod – 4 was removed due to the lack of enumerable species at this location.

Univariate statistical analyses were carried out on the station-by-station faunal data. The following parameters were calculated and can be seen in Table 4.2; taxon numbers, number of individuals,

richness, evenness, Shannon-Weiner diversity and Simpson's Diversity. Richness, evenness and Simpson's diversity could be calculated for Station Cod – 6 as only 1 species and 1 individual was recorded from this sample. Taxon numbers ranged from 1 (Station Cod - 6) to 42 (Station Cod - 12). Number of individuals ranged from 1 (Station Cod - 6) to 736 (Station Cod – 24b). Richness ranged from 0.72 (Station Cod - 37) to 6.86 (Station Cod - 12). Evenness ranged from 0.34 (Stations Cod – 1 and Cod – 24b) to 1 (Station Cod - 5). Shannon-Weiner diversity ranged from 0 (Station Cod - 6) to 4.11 (Station Cod - 9). Simpson's diversity ranged from 0.29 (Station Cod – 1) to 1 (Station Cod – 5).

Table 4.2: Univariate measures of community structure.

Station	No. Taxa	No. Individuals	Richness	Evenness	Shannon-Weiner Diversity	Simpson's Diversity
Cod - 1	9	82	1.815	0.338	1.071	0.291
Cod - 2	16	105	3.223	0.783	3.133	0.837
Cod - 3	7	63	1.448	0.410	1.151	0.342
Cod - 5	2	2	1.443	1.000	1.000	1.000
Cod - 6	1	1	-	-	0.000	-
Cod - 7	32	533	4.937	0.594	2.970	0.737
Cod - 8	25	194	4.556	0.582	2.703	0.689
Cod - 9	30	146	5.819	0.837	4.106	0.926
Cod - 10	34	286	5.835	0.623	3.172	0.772
Cod - 11	37	432	5.932	0.648	3.376	0.835
Cod - 12	42	395	6.857	0.706	3.807	0.855
Cod - 13	27	180	5.007	0.537	2.555	0.631
Cod - 14	34	388	5.536	0.736	3.743	0.891
Cod - 15	30	280	5.147	0.500	2.453	0.682
Cod - 16	6	13	1.949	0.933	2.412	0.859
Cod - 17	2	3	0.910	0.918	0.918	0.667
Cod - 18	10	60	2.198	0.611	2.030	0.635
Cod - 19	22	293	3.697	0.350	1.562	0.380
Cod - 20	12	150	2.195	0.383	1.373	0.367
Cod - 21	13	73	2.797	0.750	2.774	0.791
Cod - 22	11	44	2.643	0.813	2.811	0.818
Cod - 23	12	34	3.119	0.851	3.050	0.852
Cod - 24a	14	38	3.574	0.873	3.325	0.895
Cod - 24b	22	736	3.181	0.345	1.538	0.389
Cod - 25	10	43	2.393	0.740	2.458	0.720
Cod - 26	13	127	2.477	0.658	2.437	0.737
Cod - 29	15	85	3.151	0.593	2.315	0.628
Cod - 31	19	150	3.592	0.663	2.815	0.775
Cod - 32	9	47	2.078	0.660	2.091	0.647
Cod - 33	8	68	1.659	0.382	1.147	0.321
Cod - 34	26	370	4.228	0.361	1.697	0.403

Station	No. Taxa	No. Individuals	Richness	Evenness	Shannon-Weiner Diversity	Simpson's Diversity
Cod - 35	5	7	2.056	0.917	2.128	0.857
Cod - 36	3	5	1.243	0.865	1.371	0.700
Cod - 37	3	16	0.721	0.708	1.122	0.492
Cod - 38	4	8	1.443	0.875	1.750	0.750
Cod - 39	5	12	1.610	0.844	1.959	0.742
Cod - 40	7	13	2.339	0.914	2.565	0.872

4.1.2. Multivariate Analysis

The same data set used above for the univariate analyses was also used for the multivariate analyses. The dendrogram and the MDS plot can be seen in Figures 4.1 and 4.2 respectively. SIMPROF analysis revealed 8 statistically significant groupings between the 37 stations (the samples connected by red lines cannot be significantly differentiated). The stress level on the MDS plot indicates a good representation of the data with no real prospect of misinterpretation of overall structure.

A clear divide can be seen between **Group a** (Stations Cod – 5, Cod – 35 to Cod 40) and all the other groups (0.78% similarity). The two most similar stations in this group were Cod – 37 and Cod – 38 (58.21% similarity) with Cod – 40 joining the group at a similarity level of 6.77%. This group contained 18 species comprising 63 individuals. Of the 18 species, 8 were present only once. Only 1 of the 18 species were epifaunal (the barnacle *Balanus crenatus*), all the rest were infaunal. No colonial epifaunal species were observed at these stations. Five species accounted for 63% of the faunal abundance in this group: the sand eel *Ammodytes tobianus* (19 individuals, 30% abundance), the isopod crustacean *Eurydice spinigera* (8 individuals, 13% abundance), the polychaetes *Nephtys cirrosa* (5 individuals, 8% abundance) and *Scoloplos armiger* (4 individuals, 6% abundance) and the bivalve mollusc *Tellimya ferruginosa* (4 individuals, 6% abundance). The SIMPER analysis revealed an average group similarity of 15.19%, with 4 species contributing to 80% of the similarity: *Ammodytes tobianus* (25.84% similarity) and the polychaetes *Glycera oxycephala* (22.19% similarity), *Nephtys cirrosa* (17.14% similarity) and *Scoloplos armiger* (14.38% similarity). Table 4.3 shows the full SIMPER results. This group conforms to the JNCC habitat SS.SSA.IFiSa.IMoSa Infralittoral mobile clean sand with sparse fauna (EUNIS Code: A5.231).

The remainder of the stations was separated into 7 faunal groups. Station Cod – 6 separated from the remaining stations at a similarity level of 3.1% and formed **Group b**. This was due to the fact that

this station only contained one infaunal species, the polychaete *Pholoe inornata* and only one individual was recorded. This station did contain 3 epifaunal colonial species, the hydrozoan *Sertulariidae* sp. and the bryozoans *Lichenoporidae* sp. and *Escharella immersa.*

Group c contained stations Cod – 2, Cod – 3, Cod – 18 and Cod – 23 and this group separated from the remaining stations at a similarity level of 7.29%. Stations Cod – 2 and Cod – 3 joined at a similarity level of 36.26%, Cod – 18 and Cod – 23 joined at a similarity level of 34.2% and all 4 stations formed Group c at a similarity level of 17.08%. This group contained 30 species comprising 262 individuals. Of the 30 species, 15 species were present twice or less. Five of the 30 species recorded from these stations were epifaunal and an additional 5 colonial epifaunal species were also observed at these stations (the hydrozoans *Abietinaria abietina* and *Hydrallmania falcata*, the bryozoans *Alcyonidium diaphanum* and *Flustra foliacea* and the tunicate *Didemnum maculosum*). Four species accounted for 63% of the faunal abundance in this group: the barnacle *Balanus crenatus* (62 individuals, 24% abundance), the polychaetes *Pisione remota* (41 individuals, 16% abundance) and *Sphaerosyllis bulbosa* (37 individuals, 14% abundance) and the bivalve *Goodallia triangularis* (25 individuals, 10% abundance). The SIMPER analysis revealed an average group similarity of 23.13%, with 4 species contributing to 57.45% of the similarity: the polychaete *Syllis* sp. H (after Garwood) (15.35% similarity), the bivalve *Spisula subtruncata* (15.23% similarity), the polychaete *Glycera lapidum* (13.67% similarity) and the bivalve *Goodallia triangularis* (13.2% similarity). Table 4.3 shows the full SIMPER results. The infaunal element of this group bears a similarity to the JNCC habitat SS.SCS.ICS.MoeVen *Moerella* spp. with venerid bivalves in infralittoral gravelly sand (EUNIS Code: A5.133) and the epifaunal element of this group conforms to the JNCC habitat SS.SCS.CCS.PomB *Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (EUNIS Code: A5.141).

Group d contained station Cod – 26 and this group separated from the remaining stations at a 16.29% similarity. This station contained 13 species comprising 127 individuals. Of the 13 species, 7 were present twice or less. Five of the 13 species were epifaunal and an additional 7 colonial epifaunal species were also observed at this station (the hydrozoans *Sertulariidae* sp. and *Hydrallmania falcata* and the bryozoans *Crisiidae* sp., *Bicellariella ciliata*, *Disporellla hispida, Scruparia* sp. and *Electra pilosa*). Three species accounted for 77% of the faunal abundance in this group: the amphipod *Jassa herdmani* (54 individuals, 43% abundance), the gastropod *Onoba semicostata* (34 individuals, 27% abundance) and the ophiuroid *Amphipholis squamata* (10 individuals, 8% abundance). SIMPER analysis could not be carried out on this group because it

contained less than 2 stations. A JNCC habitat type could not be assigned to this group as the substrata at the only station in it was too hard to sample adequately and as a result the faunal returns only provide a fraction of what the biotope present.

Group e contained stations Cod – 22 and Cod – 24a. These stations formed a group at a 48.12% similarity level and this group separated from the remaining stations at a 27.46% similarity level. This group contained 19 species comprising 82 individuals. Of the 19 species, 10 species were present twice or less. Ten of the 19 species recorded from these stations were epifaunal and an additional 5 colonial epifaunal species were also observed at these stations (the hydrozoans *Sertulariidae* sp., the bryozoans *Alcyonidium diaphanum*, *Electra pilosa* and *Turbicellepora avicularis* and the tunicate *Didemnum maculosum*). Four species accounted for 63% of the faunal abundance in this group and all were epifaunal species: the polychaete *Pomatoceros lamarcki* (18 individuals, 22% abundance), the tunicate *Dendrodoa grossularia* (16 individuals, 20% abundance), the barnacle *Verruca stroemia* (10 individuals, 12% abundance) and the rock-boring bivalve *Hiatella artica* (8 individuals, 10% abundance). The SIMPER analysis revealed an average group similarity of 48.12%, with 4 species contributing to 80% of the similarity: the polychaete *Pomatoceros lamarcki* (30.52% similarity), the barnacle *Verruca stroemia* (20.35% similarity), the polychaete *Syllis armillaris* (14.39% similarity) (considered epifaunal as found in empty *Pomatoceros* tubes and burrowing within shells). Table 4.3 shows the full SIMPER results. The epifaunal element of this group bears a similarity to the JNCC habitat SS.SCS.CCS.PomB *Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (EUNIS Code: A5.141). A biotope similar to the infaunal elements could no be determined.

Group f is the largest of the groups and contains 12 stations (Cod – 7 to Cod – 15, Cod – 19, Cod – 24b and Cod – 34). Stations Cod – 7 and Cod – 24b were the most similar stations in this group (68.39% similarity), with stations Cod – 9 and Cod – 10 joining the group at a 36.09% similarity level. This group separated from the remaining stations at a 33.08% similarity level. This group contained 120 species comprising 4,233 individuals. Of the 120 species, 52 species were present twice or less. Twenty-three of the 120 species recorded from these stations were epifaunal and an additional 23 colonial epifaunal species were also observed at these stations. Four species accounted for 64% of the faunal abundance in this group and all were epifaunal species: the polychaete *Pomatoceros lamarcki* (2,049 individuals, 48% abundance), the bivalve *Hiatella arctica* (303 individuals, 7% abundance), the tunicate *Dendrodoa grossularia* (186 individuals, 4% abundance) and the barnacle *Balanus balanus* (179 individuals, 4% abundance). The SIMPER analysis revealed an average group

similarity of 40.75%, with 4 species contributing to 55% of the similarity: the polychaete *Pomatoceros lamarcki* (31.62% similarity), the bivalve *Hiatella arctica* (11.6% similarity) and the polychaetes *Syllis armillaris* (6.31% similarity), and *Dipolydora coeca* (5.67% similarity) (both epifaunal as they were found in considered epifaunal as found in empty *Pomatoceros* tubes and burrowing within shells). Table 4.3 shows the full SIMPER results. This groups bears a similarity to the JNCC habitat CR.MCR.EcCr.FaAlCr.Pom Faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium digitatum* on exposed to moderately wave-exposed circalittoral rock (EUNIS Code: A4.2145).

Group g contains 6 stations (Cod – 1, Cod – 20, Cod – 21, Cod – 29, Cod – 31 and Cod – 32). Stations Cod – 21 and Cod – 29 were the most similar stations in this group (68.35% similarity), with station Cod – 31 joining the group at a 34.57% similarity level. This group separated from Group f at 33.08% similarity level. This group contained 43 species comprising 587 individuals. Of the 43 species, 28 species were present twice or less. Twelve of the 43 species recorded from these stations were epifaunal and an additional 11 colonial epifaunal species were also observed at these stations. Three species accounted for 74% of the faunal abundance in this group: the polychaete *Pomatoceros lamarcki* (333 individuals, 57% abundance), the decapod crustacean *Pisidia longicornis* (73 individuals, 12% abundance) and the bivalve *Hiatella arctica* (26 individuals, 4% abundance). The SIMPER analysis revealed an average group similarity of 44.12%, with 4 species contributing to 90% of the similarity: the polychaete *Pomatoceros lamarcki* (52.96% similarity), the decapod crustacean *Pisidia longicornis* (9.25% similarity), the bivalve *Hiatella arctica* (8.91% similarity) and the polychaete *Dipolydora caulleryi* (6.51& similarity). Table 4.3 shows the full SIMPER results. The group bears a similarity to the JNCC habitat CR.HCR.XFa.Mol *Molgula manhattensis* with a hydroid and bryozoan turf on tide-swept moderately wave-exposed circalittoral rock (EUNIS Code: A4.138).

Group h contains 4 stations (Cod – 16, Cod – 17, Cod – 25 and Cod – 33). Stations Cod – 25 and Cod – 33 joined at a similarity level of 49.39% similarity, stations Cod – 16 and Cod – 17 joined at a similarity level of 44% and all 4 stations formed Group h at 19.17% similarity. This group separated from Groups e, f and g at a 16.9% level of similarity. This group contained 17 species comprising 127 individuals. Of the 17 species, 9 species were present twice or less. Six of the 17 species recorded from these stations were epifaunal and an additional 7 colonial epifaunal species were also observed at these stations. Four species accounted for 78% of the faunal abundance in this group: the ophiuroid *Ophiothrix fragilis* (78 individuals, 61% abundance), the bivalve *Hiatella arctica* (9 individuals, 7% abundance), the polychaete *Pomatoceros lamarcki* (6 individuals, 5% abundance) and

the barnacle *Verruca stroemia* (6 individuals, 5% abundance). The SIMPER analysis revealed an average group similarity of 28.34%, with 4 species contributing to 90% of the similarity: the polychaete *Pomatoceros lamarcki* (37.17% similarity), the barnacle *Verruca stroemia* (29.54% similarity), the ophiuroid *Ophiothrix fragilis* (15.99% similarity) and the bivalve *Hiatella arctica* (7.66% similarity).Table 4.3 shows the full SIMPER results. The group bears a similarity to the JNCC habitat CR.LCR.BrAs.AmenCio.Bri Dense brittlestars with sparse *Ascidia mentula* and *Ciona intestinalis* on sheltered circalittoral mixed substrata (EUNIS Code: A4.3112).

Figure 4.3 shows the distribution of the faunal groups through the Greater Codling Bank.

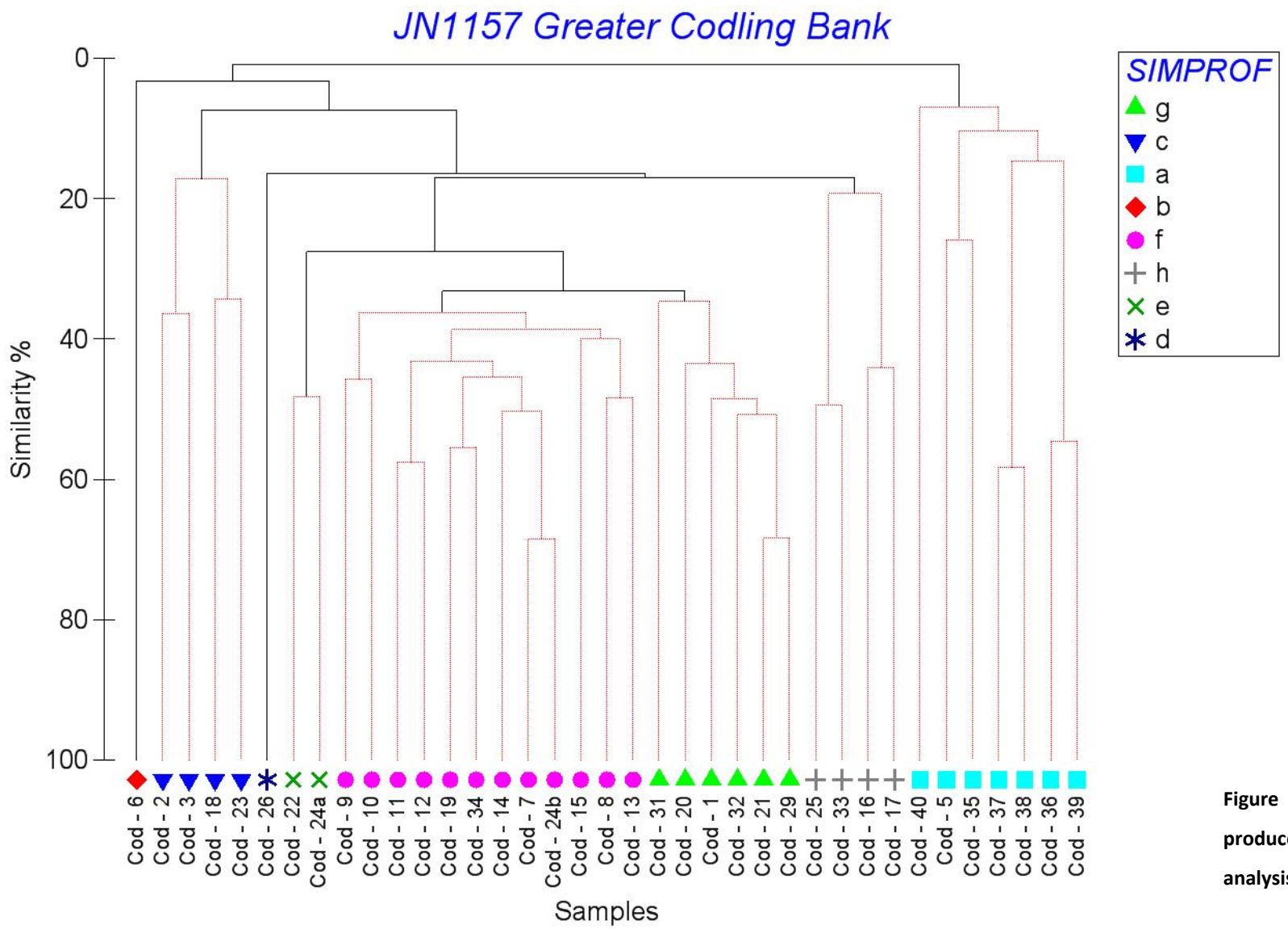


Figure 4.1: Dendrogram produced from Cluster analysis.

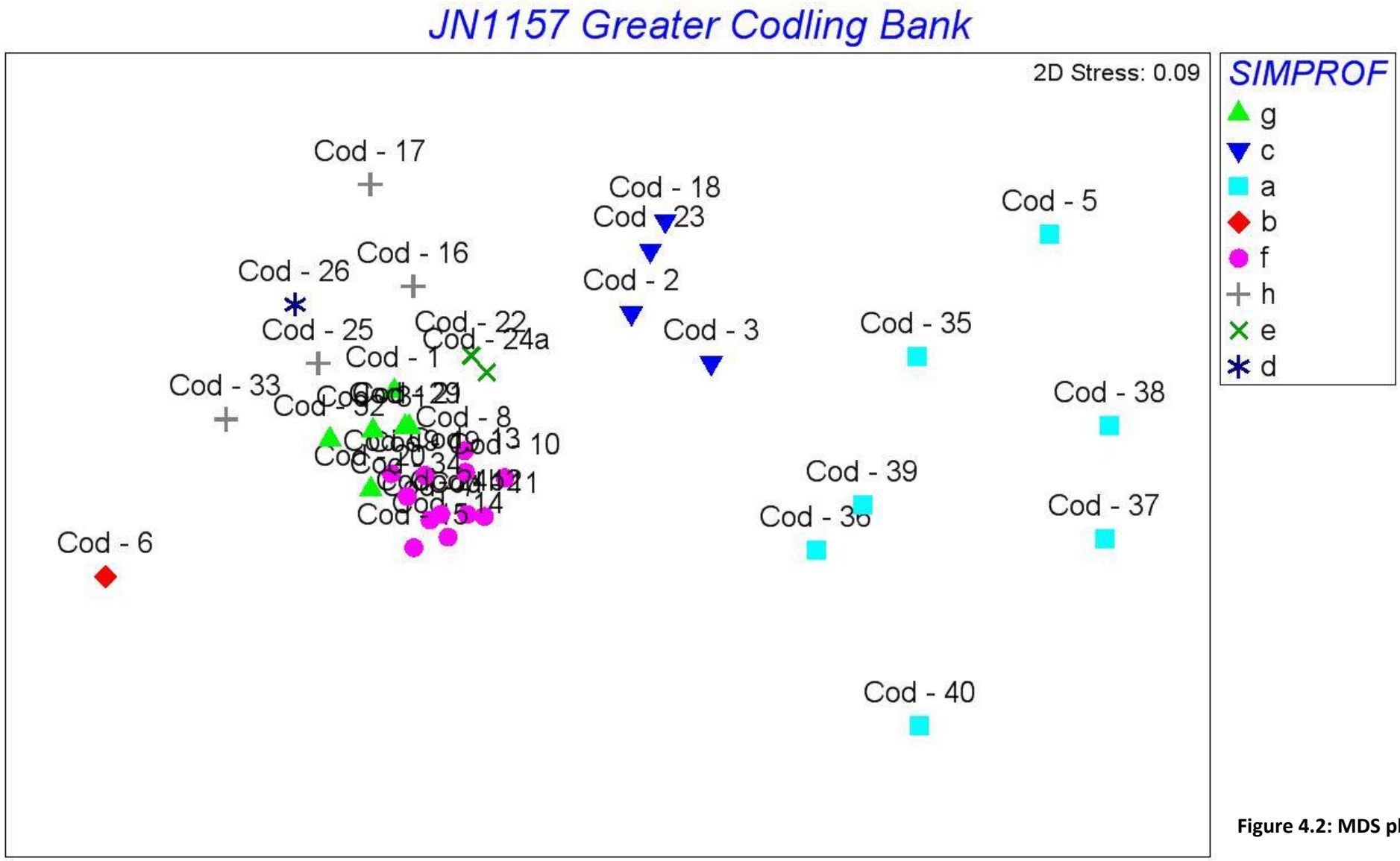


Figure 4.2: MDS plot.

Table 4.3: SIMPER Results

Group a Average similarity: 15.19					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Ammodytes tobianus	1.03	3.93	0.39	25.84	25.84
Glycera oxycephala	0.43	3.37	0.39	22.19	48.04
Nephtys cirrosa	0.53	2.6	0.39	17.14	65.18
Scoloplos armiger	0.49	2.18	0.39	14.38	79.56
Eurydice spinigera	0.57	1.62	0.22	10.69	90.25
Group b - less than 2 samples in group					
Group c Average similarity: 23.13					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Syllis sp. H (after Garwood)	1.88	3.55	0.88	15.35	15.35
Spisula subtruncata	1.29	3.52	0.83	15.23	30.58
Glycera lapidum	1.14	3.16	0.88	13.67	44.25
Goodallia triangularis	1.77	3.05	0.41	13.2	57.45
Timoclea ovata	1.04	2.37	0.89	10.26	67.71
Balanus crenatus	2.61	2.19	0.41	9.48	77.19
Sphaerosyllis bulbosa	1.98	2.12	0.89	9.14	86.33
Pisione remota	2.12	1.62	0.41	7	93.33
Group d - less than 2 samples in group					
Group e Average similarity: 48.12					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Pomatoceros lamarcki	3	14.69	#######	30.52	30.52
Verruca stroemia	2.22	9.79	#######	20.35	50.87
Syllis armillaris	1.41	6.92	#######	14.39	65.26
Hiatella arctica	1.93	6.92	#######	14.39	79.65
Syllis sp. H (after Garwood)	1.21	4.9	#######	10.17	89.83
Dipolydora caulleryi	1.5	4.9	#######	10.17	100
Group f Average similarity: 40.75					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Pomatoceros lamarcki	11.9	12.88	2.06	31.62	31.62
Hiatella arctica	4.56	4.73	2.33	11.6	43.22
Syllis armillaris	2.52	2.57	3.09	6.31	49.53
Dipolydora coeca	2.63	2.31	1.54	5.67	55.2
Balanus balanus	2.57	1.68	0.84	4.11	59.31
Pholoe inornata	1.69	1.48	1.34	3.63	62.94
Pisidia longicornis	1.98	1.37	0.92	3.35	66.29
Monocorophium sextonae	2.22	1.21	0.76	2.97	69.26
Leptochiton asellus	1.51	1.16	1.3	2.85	72.11
Verruca stroemia	1.76	1.03	0.72	2.52	74.63
Amphipholis squamata	1.63	1.03	0.93	2.52	77.15
Dipolydora caulleryi	1.33	0.87	0.72	2.13	79.28
Sabellaria spinulosa	1.45	0.8	0.78	1.97	81.25

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Anthura gracilis	1.4	0.77	0.74	1.89	83.13
Lepidonotus squamatus	1.06	0.67	0.79	1.64	84.78
Syllis variegata	0.95	0.57	0.63	1.4	86.17
Dendrodoa grossularia	2.11	0.51	0.37	1.26	87.43
Musculus discors	0.99	0.44	0.49	1.08	88.51
Gibbula tumida	0.78	0.37	0.53	0.91	89.42
Gibbula cineraria	0.66	0.35	0.41	0.87	90.29
Group g Average similarity: 44.12					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Pomatoceros lamarcki	7.18	23.37	4.12	52.96	52.96
Pisidia longicornis	2.49	4.08	1.15	9.25	62.21
Hiatella arctica	1.76	3.93	1.1	8.91	71.12
Dipolydora caulleryi	1.24	2.87	0.78	6.51	77.63
Dipolydora coeca	1.37	2.7	0.78	6.13	83.76
Verruca stroemia	0.87	1.78	0.75	4.03	87.79
Monocorophium sextonae	1.41	1.69	0.47	3.83	91.62
Group h Average similarity: 28.34					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Pomatoceros lamarcki	1.21	10.54	2.46	37.17	37.17
Verruca stroemia	1.06	8.37	0.8	29.54	66.71
Ophiothrix fragilis	3.04	4.53	0.41	15.99	82.7
Hiatella arctica	1.05	2.17	0.41	7.66	90.36

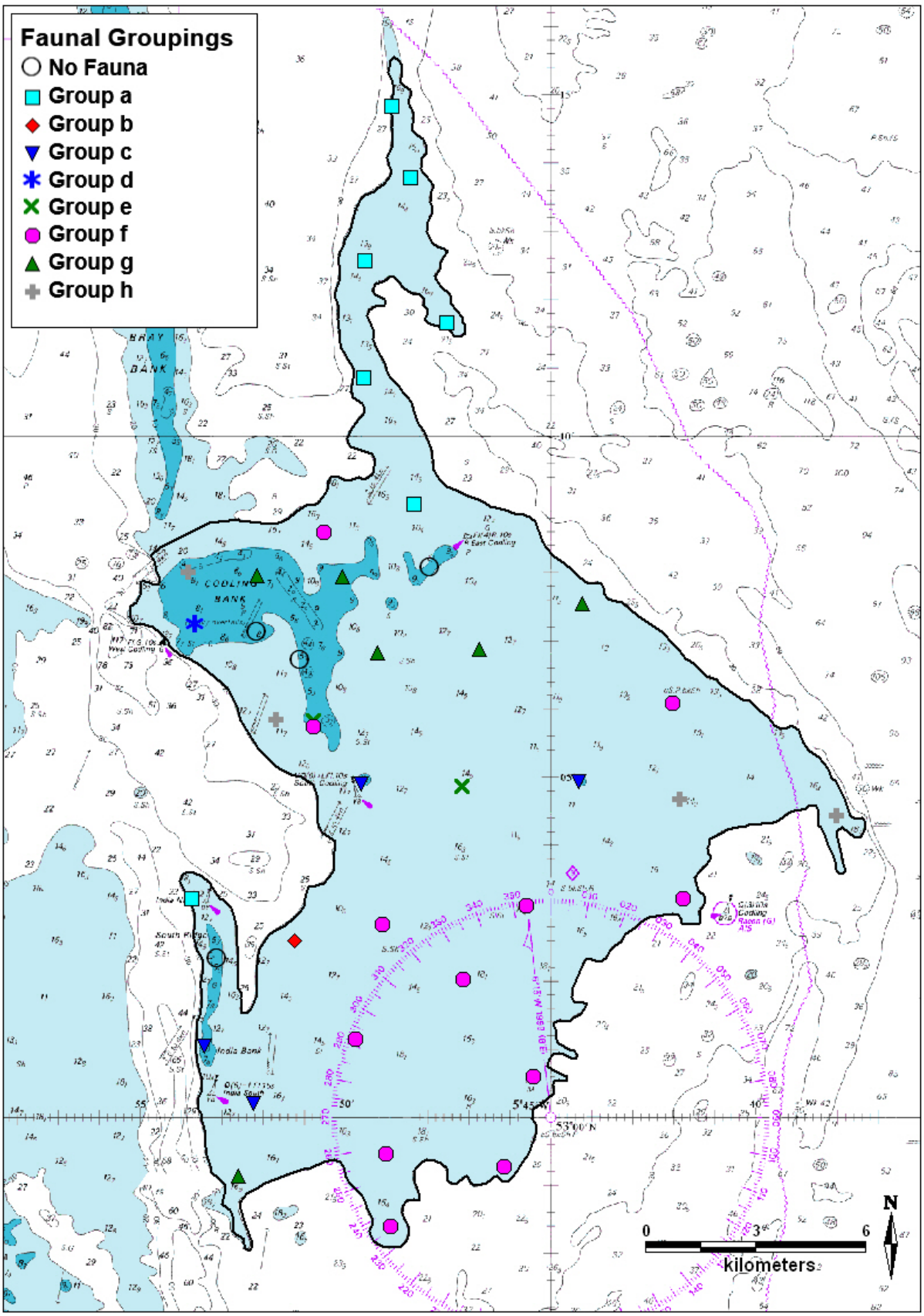


Figure 4.3: Location of faunal groupings over the Greater Codling Bank area.

4.2. Sediment

Due to the nature of the substrata at some of the sampled stations, sufficient sediment could not be retrieved from every station for organic carbon and granulometric analysis.

Table 4.4 shows the organic carbon results and Table 4.5 shows the sediment type and the sediment classification (Folk, 1954) attributed to each station which returned sufficient sediment for analysis. Organic carbon levels ranged from 0.26% at station Cod - 35 to 1.74% at station Cod - 2.

Table 4.4: Organic carbon results from the 11 grab stations sampled.

Station	LOI @ 450°C (%)
Cod - 2	1.74
Cod - 3	0.52
Cod - 13	1.16
Cod - 23	0.94
Cod – 24a	0.42
Cod - 34	0.63
Cod - 35	0.26
Cod - 36	0.42
Cod - 37	0.38
Cod - 38	0.60
Cod - 39	0.46
Cod - 40	0.42

Station Cod - 2 contained the highest percentage of gravel (fine and very fine; 74.5%), Cod – 18 had the highest percentage of very coarse sand (24.5%), Cod – 4 had the highest percentage of coarse sand (72.3%), Cod – 37 had the highest percentage of medium sand (90.3%), Cod – 40 had the highest percentage of fine sand (41.4%), very fine sand (0.4%) and silt-clay (0.3%).

The sediment sampled from the Greater Codling Bank was classified as sand, slightly gravelly sand, gravelly sand and sandy gravel according to Folk (1954). Fourteen out of the 40 stations sampled returned sufficient quantities of sediment for granulometric analysis. The remaining stations were assigned a substrate type following an assessment of the sample by eye. Table 4.5 shows the percentage grain size at each station and the Folk (1954) classification. The substrata type at all stations can be seen graphically in Figure 4.4 below.

Table 4.5: Sediment type and Folk (1954) classification.

Station	% >8000µm (>Medium Gravel)	% 4000<8000µm (Fine Gravel)	% 2000<4000µm (Very Fine Gravel)	% 1000<2000µm (Very Coarse Sand)	% 500<1000µm (Coarse Sand)	% 250<500µm (Medium Sand)	% 125<250µm (Fine Sand)	% 63<125µm (Very Fine Sand)	% <63µm (Silt-Clay	Folk Classification
Cod - 1	100	0	0	0	0	0	0	0	0	Gravel
Cod - 2	0	61.2	13.3	9.1	8.7	7.4	0.2	0.1	0	Sandy Gravel
Cod - 3	0	16	8.9	10.1	23.9	37.4	3.6	0.1	0.1	Gravelly Sand
Cod - 4	0	0.5	1.1	17.3	72.3	8.7	0.1	0	0	Slightly Gravelly Sand
Cod - 5	0	30.1	7.7	9.2	41.7	11	0.2	0	0	Sandy Gravel
Cod - 6	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 7	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 8	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 9	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 10	100	0	0	0	0	0	0	0	0	Gravel
Cod - 11	100	0	0	0	0	0	0	0	0	Gravel (Shell)
Cod - 12	100	0	0	0	0	0	0	0	0	Gravel
Cod - 13	0	52.2	10.5	8.6	9.8	18.5	0.3	0	0.1	Sandy Gravel
Cod - 14	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 15	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 16	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 17	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 18	0	20.3	39.9	24.5	13.1	2.2	0.1	0	0	Sandy Gravel
Cod - 19	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 20	100	0	0	0	0	0	0	0	0	Gravel & Cobble

Station	% >8000µm (>Medium Gravel)	% 4000<8000µm (Fine Gravel)	% 2000<4000µm (Very Fine Gravel)	% 1000<2000µm (Very Coarse Sand)	% 500<1000µm (Coarse Sand)	% 250<500µm (Medium Sand)	% 125<250µm (Fine Sand)	% 63<125µm (Very Fine Sand)	% <63µm (Silt-Clay	Folk Classification
Cod - 21	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 22	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 23	0	21.8	17.4	7.4	12.1	40.6	0.7	0	0.1	Sandy Gravel
Cod - 24a	0	2.2	0.9	3.3	27.8	62.2	3.6	0	0	Slightly Gravelly Sand
Cod - 24b	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 25	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 26	75	0	0	0	0	25	0	0	0	Sand & Gravel
Cod - 27	-	-	-	-	-	-	-	-	-	Bedrock
Cod - 28	-	-	-	-	-	-	-	-	-	Bedrock
Cod - 29	100	0	0	0	0	0	0	0	0	Gravel
Cod - 30	-	-	-	-	-	-	-	-	-	Bedrock
Cod - 31	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 32	100	0	0	0	0	0	0	0	0	Gravel & Cobble
Cod - 33	100	0	0	0	0	0	0	0	0	Gravel
Cod - 34	0	58.6	4.4	8	9.5	12.3	6.6	0.3	0.1	Sandy Gravel
Cod - 35	0	0	0.5	1.6	9.5	81.2	7	0.1	0	Sand
Cod - 36	0	0	0	0	1.7	83.2	15	0.1	0	Sand
Cod - 37	0	0	0.1	0.2	3.5	90.3	5.8	0	0.1	Sand
Cod - 38	0	0.4	1.6	3	29.8	62.4	2.7	0	0	Slightly Gravelly Sand
Cod - 39	100	0	0.1	0.4	0.9	71.1	27.2	0.2	0.2	Sand

Station	% >8000µm (>Medium Gravel)	% 4000<8000µm (Fine Gravel)	% 2000<4000µm (Very Fine Gravel)	% 1000<2000µm (Very Coarse Sand)	% 500<1000µm (Coarse Sand)	% 250<500µm (Medium Sand)	% 125<250µm (Fine Sand)	% 63<125µm (Very Fine Sand)	% <63µm (Silt-Clay	Folk Classification
Cod - 40	0	0	0	0.3	0.8	57.2	41.1	0.4	0.3	Sand

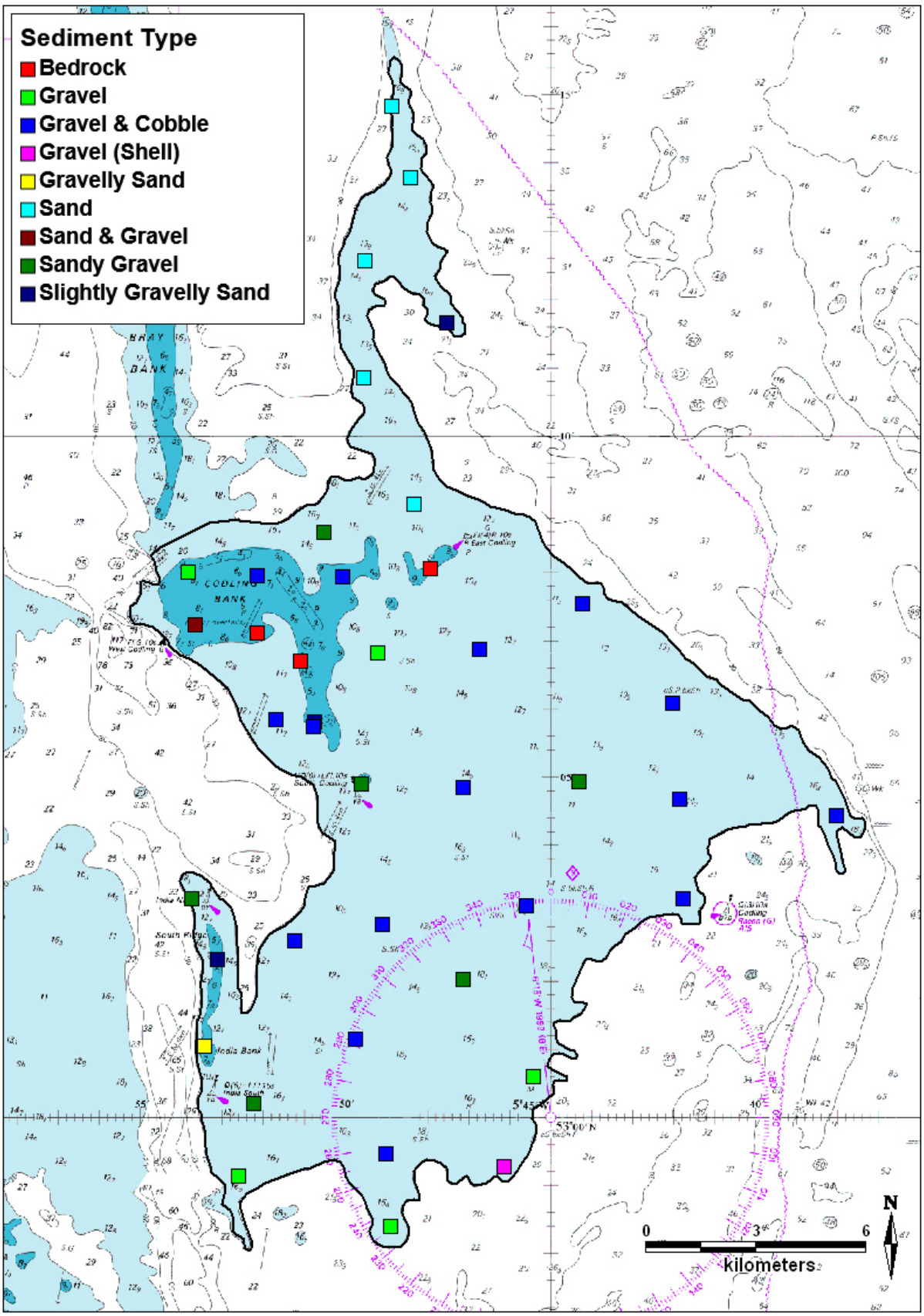


Figure 4.4: Substrate type at the Greater Codling Bank.

4.2.1. Multivariate Analysis

The traditional granulometric results and the LOI results were used to carry out the PCA analysis. As a result, only those 15 stations where sediment was recovered could be used. In addition, PCA analysis requires a complete data matrix and as a result the three sites from which an insufficient fine fraction was retained for LOI analysis (Cod – 5, Cod – 5 and Cod - 18) also had to be removed from the analysis. The resultant PCA plot can be seen in Figure 4.5 (colour coded with the faunal groupings). This shows stations Cod - 35, Cod - 36 and Cod – 37 grouping together as all three had the highest medium sand fraction (0.25 – 0.5mm), with stations Cod - 39 and Cod – 40 having the highest fine fractions (<0.063 – 0.25mm), stations Cod – 24a and Cod – 38 having the highest coarse sand fractions (0.5 – 1mm) and stations Cod – 2, Cod – 3, Cod – 13, Cod 23 and Cod 34 having the highest very coarse sand to fine gravel fractions (1-8mm) and highest organic content levels (LOI).

To gain a wider appreciation of all the stations, PCA analysis was run a second time using the sediment type data from all stations (see in Table 4.6 above, LOI data could not be used as there was no results for the majority of the stations). As expected, this plot (Figure 4.6) shows the same groupings seen in the original PCA with the addition of stations Cod – 4, Cod 5 and Cod – 18 to the very coarse sand to fine gravel group and all of the remaining stations formed a new group as sediment type at these stations was medium gravel and coarser (>8mm).

The BIOENV procedure was carried out to attempt to link the faunal groupings to the environmental variables. Only the 12 stations that had traditional granulometric and LOI results could be used. The highest correlation possible (0.369) between the macrofaunal and sediment rank matrices is derived from three variables: fine gravel, very coarse sand and very fine sand. However, this correlation of 0.369 indicates that the sediment data is not powerful enough to explain the distribution of macrofauna. However, when all sediment data is used (traditional granulometric results and substrate type determined by eye, LOI was not used as it was not available for all stations), the highest correlation possible (0.627) between the macrofaunal and sediment rank matrices is derived from four variables: very fine gravel, coarse sand, medium sand and fine sand. This correlation indicates that these four parameters are reasonable powerful enough to explain the faunal groupings.

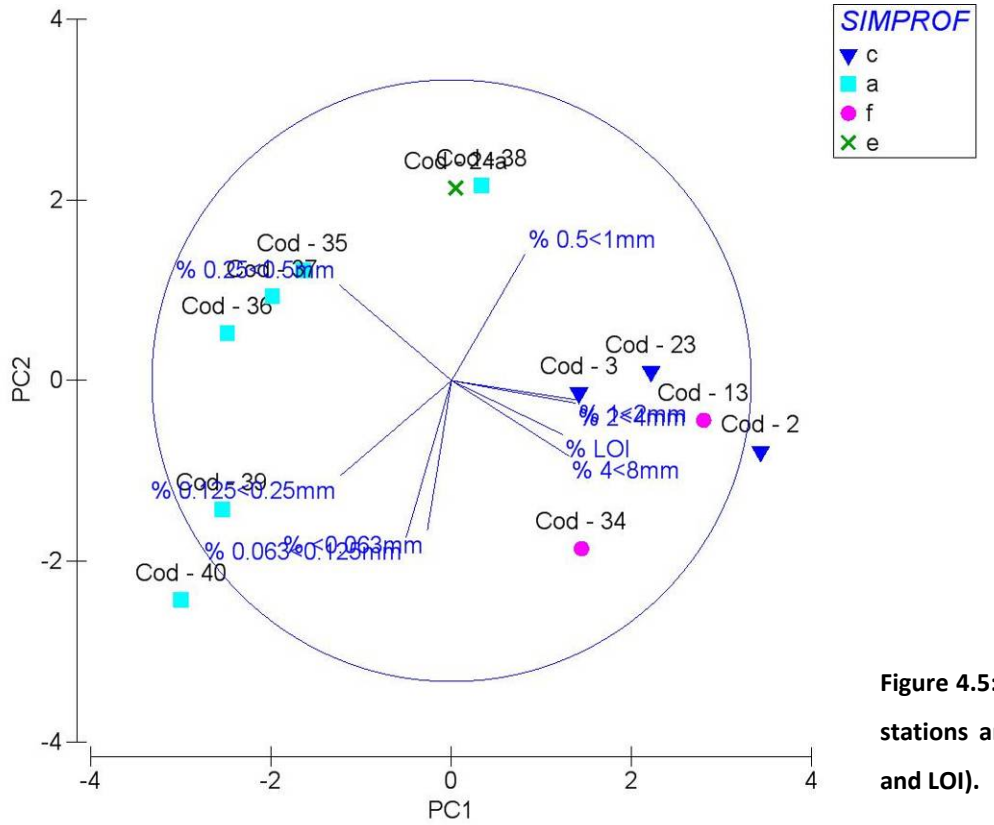


Figure 4.5: PCA plot for all 12 stations analysed (Grain size and LOI).

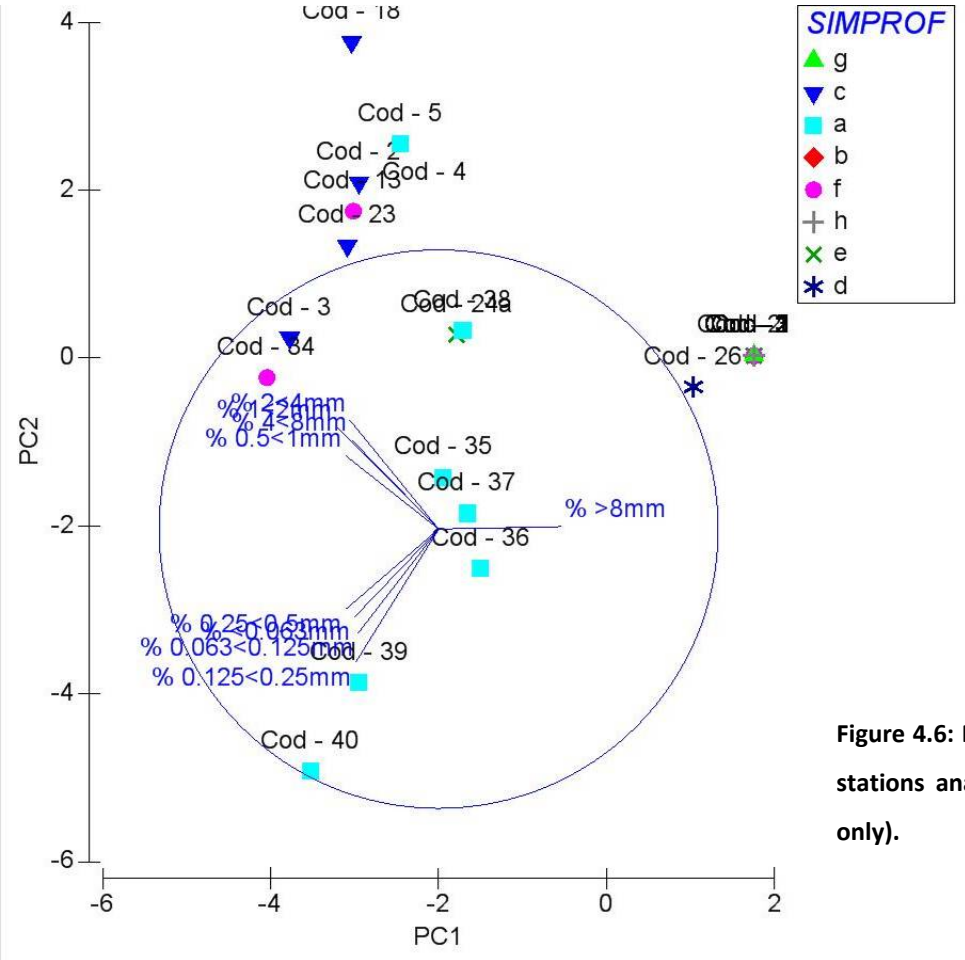


Figure 4.6: PCA plot for all 41 stations analysed (Grain size only).

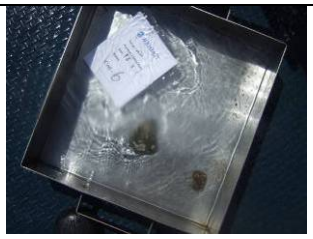
4.3. Station Summary

Table 4.6 below summaries the station – by – station data.

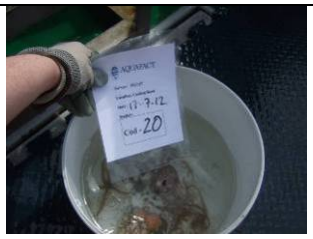
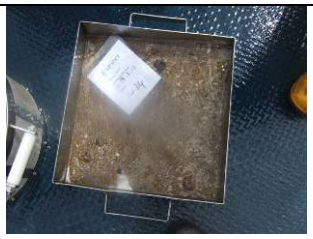
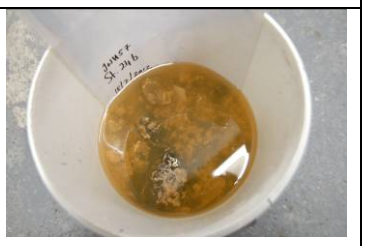
Table 4.6: Station summary data

Station	Depth (m)	No. Taxa[1]	No. Individuals[1]	Sediment Type	Photo
Cod - 1	19.6	23	110	Gravel	
Cod - 2	16.6	43	315	Sandy Gravel	
Cod - 3	14.4	16	78	Gravelly Sand	
Cod - 4	7.6	1	0	Slightly Gravelly Sand	
Cod - 5	25.4	7	7	Sandy Gravel	

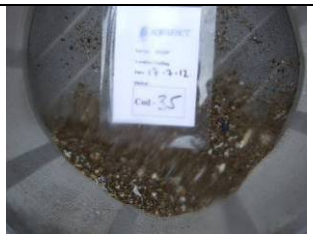
[1] Based on entire faunal abundance list

Station	Depth (m)	No. Taxa[1]	No. Individuals[1]	Sediment Type	Photo
Cod - 6	21.2	5	3	Gravel & Cobble	
Cod - 7	16.1	58	887	Gravel & Cobble	
Cod - 8	19.1	52	312	Gravel & Cobble	
Cod - 9	20.1	66	232	Gravel & Cobble	
Cod - 10	19.4	76	405	Gravel	
Cod - 11	24.3	72	544	Gravel (Shell)	
Cod - 12	22.4	75	604	Gravel	

Station	Depth (m)	No. Taxa[1]	No. Individuals[1]	Sediment Type	Photo
Cod - 13	19.1	56	284	Sandy Gravel	
Cod - 14	19.3	68	612	Gravel & Cobble	
Cod - 15	21.5	64	380	Gravel & Cobble	
Cod - 16	21.3	10	41	Gravel & Cobble	
Cod - 17	17.6	10	19	Gravel & Cobble	
Cod - 18	17.6	16	83	Sandy Gravel	
Cod - 19	19.8	42	372	Gravel & Cobble	

Station	Depth (m)	No. Taxa[1]	No. Individuals[1]	Sediment Type	Photo
Cod - 20	17.6	24	209	Gravel & Cobble	
Cod - 21	15.4	29	169	Gravel & Cobble	
Cod - 22	18.7	32	185	Gravel & Cobble	
Cod - 23	16.5	21	54	Sandy Gravel	
Cod - 24a	15.5	32	81	Slightly Gravelly Sand	
Cod - 24b	15.5	46	1079	Gravel & Cobble	
Cod - 25	14.7	21	59	Gravel & Cobble	

Station	Depth (m)	No. Taxa[1]	No. Individuals[1]	Sediment Type	Photo
Cod - 26	10	32	192	Sand & Gravel	
Cod - 27	11.9	-	-	Bedrock	-
Cod - 28	9.7	-	-	Bedrock	-
Cod - 29	13.1	34	144	Gravel	
Cod - 30	13	-	-	Bedrock	-
Cod - 31	12.5	38	207	Gravel & Cobble	
Cod - 32	10.3	28	114	Gravel & Cobble	
Cod - 33	11.8	19	79	Gravel	
Cod - 34	17.3	48	505	Sandy Gravel	

Station	Depth (m)	No. Taxa[1]	No. Individuals[1]	Sediment Type	Photo
Cod - 35	18.1	8	20	Sand	
Cod - 36	19.5	5	8	Sand	
Cod - 37	20.8	3	16	Sand	
Cod - 38	24.8	6	11	Slightly Gravelly Sand	
Cod - 39	21.5	9	21	Sand	
Cod - 40	24.8	10	20	Sand	

5. Discussion/Conclusion

A previous survey of the Great Codling Bank carried out in 2001/2002 for a proposed offshore wind farm revealed a rich mosiac of faunal communities with benthic species typical of those found on

current swept 'circalittoral rock' (Natural Power, 2003). As with the current survey, the highest faunal diversity was generally found at stations with boulders, which provided a suitable substrate for colonisation by a variety of colonial anumals including hydroids and bryozoans with varying diversities of associated cryptofauna. Attached fauna was dominated by the bryozoans *Flustra foliacea* (hornwrack) and *Electra pilosa* (hairy sea-mat). The soft coral *Alcyoniun digitatum* (dead man's fingers) and the common sea urchin (*Echinus esculentus*) were also common.

Results from the current survey show that a gravelly / cobbly seabed dominated the Greater Codling Bank. Where finer substrates were encountered they ranged from medium sand in the north to gravelly sands in the northeastern and southwestern areas. Sandy gravel pockets dominated in amongst the gravel and cobble beds. Isolated areas of bedrock were encountered in the shallower regions mainly over the Codling Bank in the northwesern part of the Greater Codling Bank. Organic content levels were low as expected given the coarse and sandy nature of the seabed.

Eight different faunal groupings were identified from the Greater Codling Bank. Given the range in sediment types across the bank, the fauna present was a mixture of both infaunal and epifaunal taxa. Group a was dominated by the sand eel *Ammodytes tobianus*, the isopod crustacean *Eurydice spinigera*, the polychaetes *Nephtys cirrosa* and *Scoloplos armiger* and the bivalve mollusc *Tellimya ferruginosa*. This group conforms to the JNCC habitat SS.SSA.IFiSa.IMoSa Infralittoral mobile clean sand with sparse fauna (EUNIS Code: A5.231). Group b contained only 1 station contained 3 epifaunal colonial species, the hydrozoan *Sertulariidae* sp. and the bryozoans *Lichenoporidae* sp. and *Escharella immersa.*

Group c was dominated by the barnacle *Balanus crenatus*, the polychaetes *Pisione remota* and *Sphaerosyllis bulbosa* and the bivalve *Goodallia triangularis* and a number of colonial epifaunal species were also observed. The infaunal element of this group bears a similarity to the JNCC habitat SS.SCS.ICS.MoeVen *Moerella* spp. with venerid bivalves in infralittoral gravelly sand (EUNIS Code: A5.133) and the epifaunal element of this group conforms to the JNCC habitat SS.SCS.CCS.PomB *Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (EUNIS Code: A5.141). Group d was dominated by the amphipod *Jassa herdmani*, the gastropod *Onoba semicostata* (and the ophiuroid *Amphipholis squamata* and 7 colonial epifaunal species were also observed at this station. A JNCC habitat type could not be assigned to this group as the substrata at the only station in it was too hard to sample adequately and as a result the faunal returns only provide a fraction of what the biotope present.

Group e was dominated by the polychaete *Pomatoceros lamarcki*, the tunicate *Dendrodoa grossularia*, the barnacle *Verruca stroemia* and the rock-boring bivalve *Hiatella artica*. Five colonial epifaunal species were also observed at these stations The epifaunal element of this group bears a similarity to the JNCC habitat SS.SCS.CCS.PomB *Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (EUNIS Code: A5.141). A biotope similar to the infaunal elements could not be determined.

Group f was the largest of the groups and the polychaete *Pomatoceros lamarcki*, the bivalve *Hiatella arctica*, the tunicate *Dendrodoa grossularia* and the barnacle *Balanus balanus* dominated this group. An additional 23 colonial epifaunal species were also observed at these stations. This groups bears a similarity to the JNCC habitat CR.MCR.EcCr.FaAlCr.Pom Faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium digitatum* on exposed to moderately wave-exposed circalittoral rock (EUNIS Code: A4.2145).

Group g was dominated by the polychaete *Pomatoceros lamarcki*, the decapod crustacean *Pisidia longicornis* and the bivalve *Hiatella arctica*. An additional 11 colonial epifaunal species were also observed at these stations. The group bears a similarity to the JNCC habitat CR.HCR.XFa.Mol *Molgula manhattensis* with a hydroid and bryozoan turf on tide-swept moderately wave-exposed circalittoral rock (EUNIS Code: A4.138).

Group h was dominated by the ophiuroid *Ophiothrix fragilis*, the bivalve *Hiatella arctica*, the polychaete *Pomatoceros lamarcki* and the barnacle *Verruca stroemia*. An additional 7 colonial epifaunal species were also observed at these stations. The group bears a similarity to the JNCC habitat CR.LCR.BrAs.AmenCio.Bri Dense brittlestars with sparse *Ascidia mentula* and *Ciona intestinalis* on sheltered circalittoral mixed substrata (EUNIS Code: A4.3112).

All of the species present are typical of such coarse gravelly and sandy sediments, where current speeds and sediment mobility area high. A species of note is the reef forming polychaete *Sabellaria spinulosa*. Reefs formed by this species are protected under OSPAR. While individuals were found in very low densities during this survey, further exploration may be require to determine the presence of reefs in this locality. In addition, given the coarse nature of the Greater Codling Bank, a dredge may have been a more suitable sampling option over the harder ground.

6. References

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Appendix 1
Additional Sampling Information

The information recorded during the sampling survey can be seen in the table below. The locations of each grab attempt and the outcome of each sampling attempt can be seen in the accompanying maps.

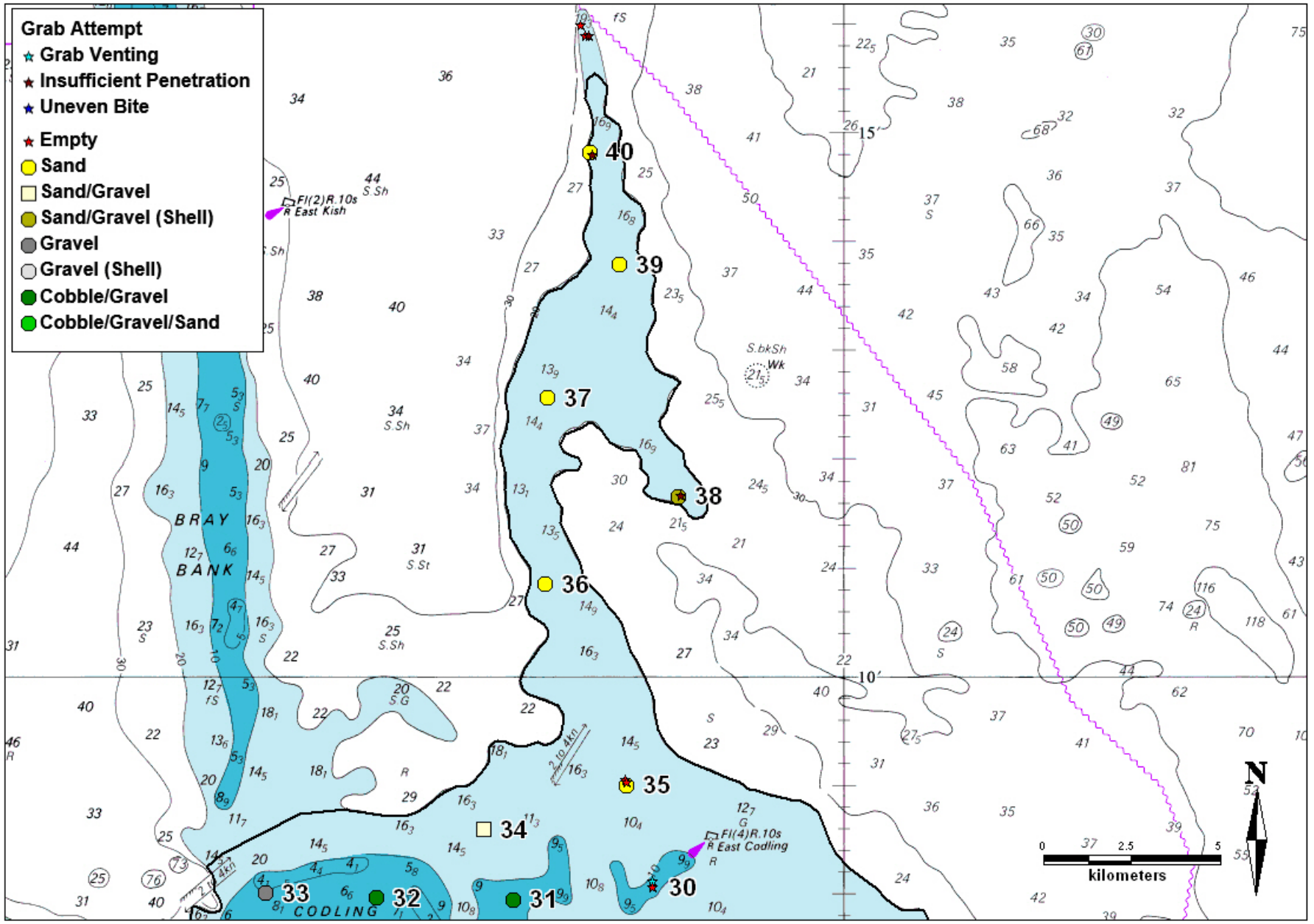
Station	Attempt	Outcome	Date	Time	Longitude	Latitude	Depth (m)	Penetration (cm)	Sediment Type	Fauna	Sandbank Type	Sediment Sample
40	1	Empty	17/07/2012	10:11:03	-5.8176	53.26533	24.8	-	-	-	-	-
	2	Empty	17/07/2012	10:16:36	-5.8188	53.26695	24.1	-	-	-	-	-
	3	Thin layer of fine sand	17/07/2012	10:20:55	-5.81665	53.2653	24.9	-	-	-	-	-
	4	Bit more fine sand	17/07/2012	10:31:36	-5.81587	53.24708	24.8	-	-	-	-	-
	5	Sample	17/07/2012	10:33:23	-5.8163	53.24738	24.8	7	FMS	Echinocardium cordatum	Clean Sand	Y
39	1	Sample	17/07/2012	10:44:24	-5.8088	53.23018	21.5	9	FMS	Sand eels	Clean Sand	Y
37	1	Sample	17/07/2012	10:56:20	-5.82732	53.20968	20.8	12	FMS	Sand eels	Clean Sand	Y
38	1	1cm sample	17/07/2012	11:08:49	-5.7931	53.19465	24.8	-	-	-	-	-
	2	Sample	17/07/2012	11:10:22	-5.7937	53.19458	24.8	12	Sand/Gravel (Shell)		Clean Sand	Y
36	1	Sample	17/07/2012	11:22:48	-5.82773	53.18108	19.5	10	FS	Nereids	Clean Sand	Y
35	1	Empty	17/07/2012	11:37:21	-5.80723	53.151	18.7	-	-	-	-	-
	2	Empty	17/07/2012	11:38:54	-5.80693	53.1507	18.8	-	-	-	-	-
	3	Sample	17/07/2012	11:40:57	-5.807	53.15025	18.1	11	FMS		Clean Sand	Y
34	1	Sample	17/07/2012	11:51:33	-5.8436	53.14343	17.3	7	Sand/Gravel	Antedon, serpulids, psammechinus		Y
33	1	Sample	17/07/2012	12:07:29	-5.89922	53.13358	11.8	3	Gravel	O. nigra, A. digitatum	Gravelly	N
32	1	Sample	17/07/2012	12:19:08	-5.87093	53.13292	10.3	4	Cobble/Gravel		Gravelly	N
31	1	Sample	17/07/2012	12:31:19	-5.83605	53.13258	12.5	7	Cobble/Gravel	Psammechinus	Gravelly	N
30	1	Stone in Jaw	17/07/2012	12:42:43	-5.80033	53.13547	13.3	-	-	-	-	-
	2	Empty	17/07/2012	12:44:39	-5.8004	53.13455	12.8		Hard Ground	No Sample		N
20	1	3cm sample	17/07/2012	13:01:24	-5.7388	53.12598	17.6	3	Cobble/Gravel	Brittlestars	Gravelly	N

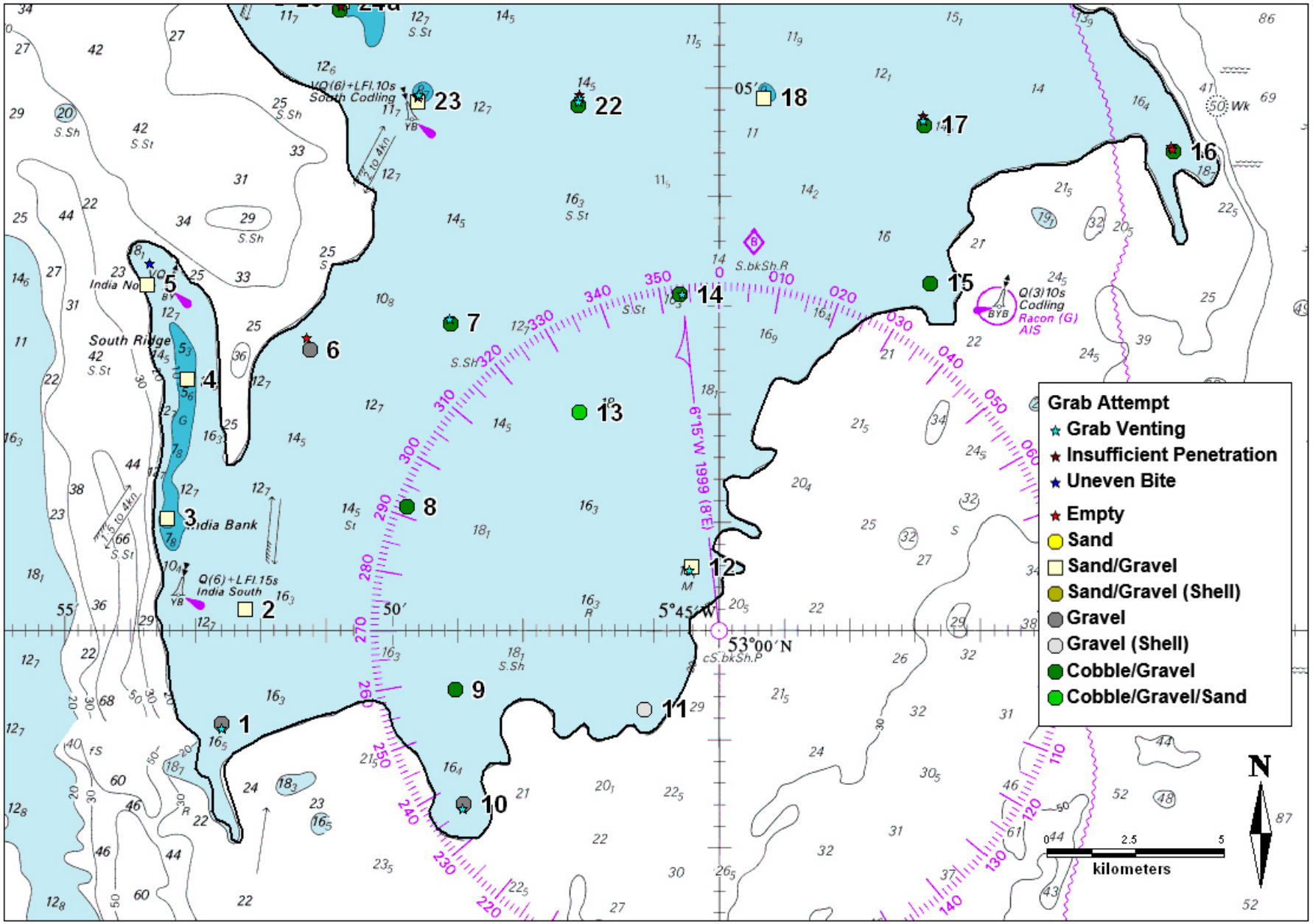
Station	Attempt	Outcome	Date	Time	Longitude	Latitude	Depth (m)	Penetration (cm)	Sediment Type	Fauna	Sandbank Type	Sediment Sample
	2	Empty	17/07/2012	13:03:32	-5.73867	53.12485	16.1	-	-	-	-	-
21	1	Sample	17/07/2012	13:16:14	-5.78033	53.11473	15.4	4	Cobble/Gravel		Gravelly	N
29	1	Stone in Jaw	17/07/2012	13:30:29	-5.82157	53.11458	13.3	-	-	-	-	-
	2	Sample	17/07/2012	13:32:11	-5.82178	53.11388	13.1	4	Gravel		Gravelly	N
28	1	Stone in Jaw	17/07/2012	13:41:48	-5.85145	53.11598	10.1	-	-	-	-	-
	2	Empty	17/07/2012	13:50:10	-5.85322	53.11207	9.4		Hard Ground	No Sample		N
27	1	Empty	17/07/2012	13:57:45	-5.87042	53.11938	11.9	-	-	-	-	-
	2	Empty	17/07/2012	13:59:13	-5.87085	53.11877	12		Hard Ground	No Sample		N
26	1	Empty	17/07/2012	14:06:04	-5.89593	53.12078	10		Hard Ground	No Sample		N
1	1	Stones in Jaw	18/07/2012	09:14:54	-5.87835	52.98515	19.1	-	-	-	-	-
	2	Stones in Jaw	18/07/2012	09:16:12	-5.8784	52.98593	19.6		Gravel		Gravelly	N
10	1	Stones in Jaw	18/07/2012	09:32:48	-5.8169	52.97285	19.9	-	-	-	-	-
	2	Sample	18/07/2012	09:34:02	-5.81658	52.97353	19.4	5	Gravel	Eurynome crab	Gravelly	N
11	1	Sample	18/07/2012	09:45:46	-5.77037	52.98823	24.3	7	Gravel (Shell)		Gravelly	N
12	1	Stone in Jaw	18/07/2012	09:56:35	-5.75895	53.00955	22.3	-	-	-	-	-
	2	Sample	18/07/2012	09:57:50	-5.75852	53.01008	22.4	7	Sand/Gravel	Psammechinus	Gravelly/ Sand	N
9	1	Sample	18/07/2012	10:14:08	-5.81877	52.9912	20.1	4	Cobble/Gravel	O. nigra, Ophiothrix	Gravelly	N
2	1	Sample	18/07/2012	10:27:13	-5.87245	53.00353	16.6	7	Sand/Gravel		Gravelly/ Sand	Y
3	1	Sample	18/07/2012	10:34:35	-5.89232	53.01765	14.4	11	Sand/Gravel		Gravelly/ Sand	Y
8	1	Sample	18/07/2012	10:47:36	-5.83093	53.01935	19.1	4	Cobble/Gravel		Gravelly	N

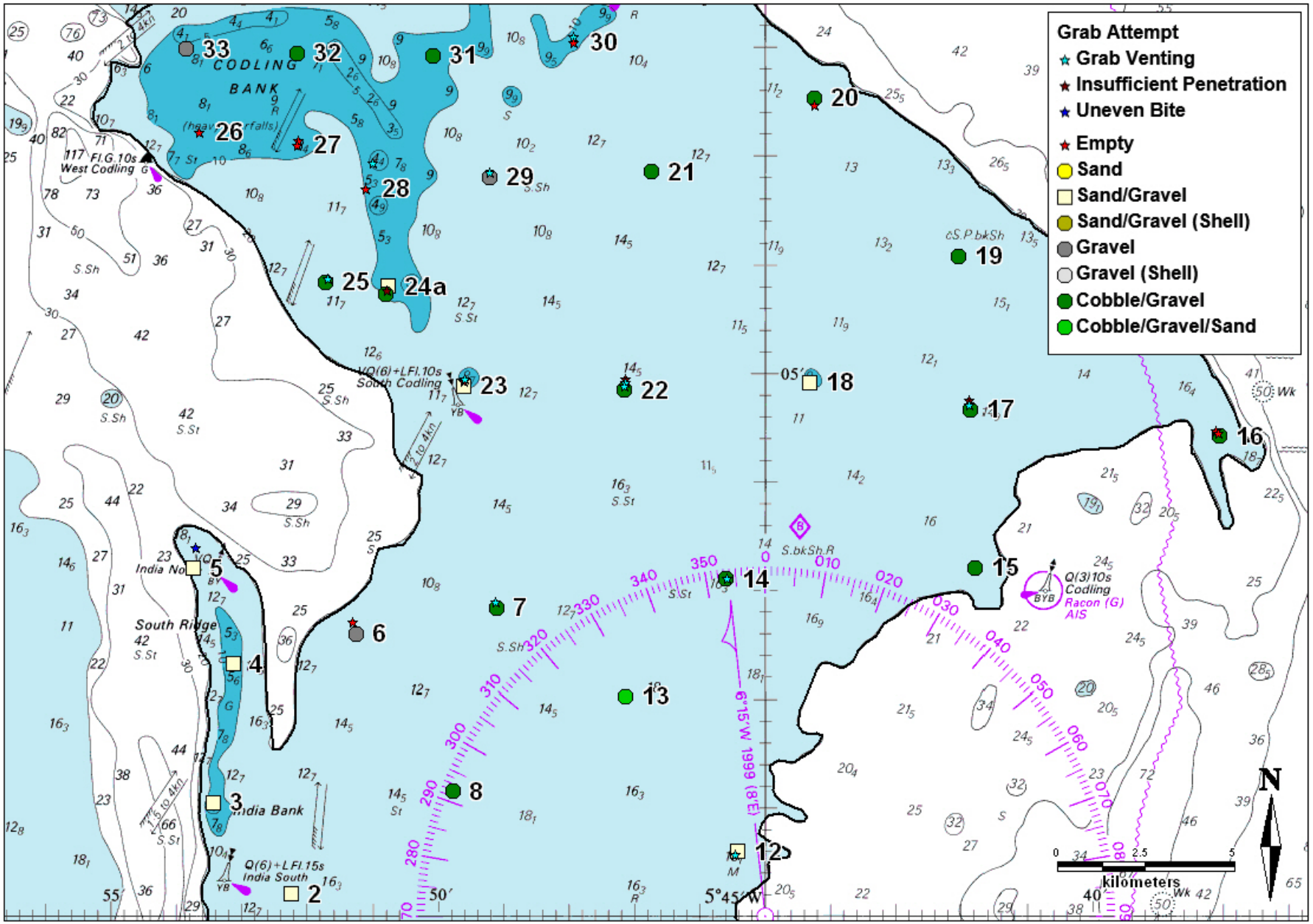
Station	Attempt	Outcome	Date	Time	Longitude	Latitude	Depth (m)	Penetration (cm)	Sediment Type	Fauna	Sandbank Type	Sediment Sample
13	1	Sample	18/07/2012	10:59:20	-5.787	53.03395	19.1	7	Cobble/Gravel/ Sand		Gravelly/ Sand	Y
14	1	Sample	18/07/2012	11:10:04	-5.76145	53.05205	19.3	5	Cobble/Gravel	Asterias	Gravelly	N
	2	Rock in jaws	18/07/2012	11:11:48	-5.76093	53.05205		-	-	-	-	-
15	1	Sample	18/07/2012	11:25:57	-5.69763	53.05382	21.5	2	Cobble/Gravel		Gravelly	N
16	1	Empty	18/07/2012	11:42:23	-5.63613	53.07485	22.3	-	-	-	-	-
	2	Empty	18/07/2012	11:43:54	-5.63565	53.0745	21.2	-	-	-	-	-
	3	Sample	18/07/2012	11:45:21	-5.63533	53.07403	21.3	3	Cobble/Gravel	Barnacles	Gravelly	N
17	1	Scrap of sand	18/07/2012	12:03:42	-5.69918	53.07952	18	-	-	-	-	-
	2	Stone in Jaw	18/07/2012	12:05:02	-5.69917	53.07883	17.3	-	-	-	-	-
	3	Rock in jaws	18/07/2012	12:06:19	-5.69908	53.07813	17.6		Cobble/Gravel		Gravelly	N
19	1	Sample	18/07/2012	12:21:03	-5.70203	53.1017	19.8	5	Cobble/Gravel	Antedon & Psammechinus	Gravelly	N
18	1	Sample	18/07/2012	12:32:48	-5.74012	53.08233	17.6	11	Sand/Gravel		Gravelly/ Sand	Y
22	1	0.5cm sand	18/07/2012	12:43:57	-5.78693	53.08288	18.2	-	-	-	-	-
	2	Stone in Jaw & sand	18/07/2012	12:45:06	-5.78713	53.08227	19.1	-	-	-	-	-
	3	Stone in Jaw & sand	18/07/2012	12:46:20	-5.7872	53.08167	18.7	-	-	-	-	-
	4	Sample	18/07/2012	12:47:24	-5.78737	53.08115	18.7	3	Cobble/Gravel	Sabellaria reef maybe	Gravelly	N

Station	Attempt	Outcome	Date	Time	Longitude	Latitude	Depth (m)	Penetration (cm)	Sediment Type	Fauna	Sandbank Type	Sediment Sample
23	1	Stone in jaw	18/07/2012	12:57:03	-5.82808	53.08287	16.2	-	-	-	-	-
	2	Stones & Cobbles 2cm	18/07/2012	12:58:08	-5.82827	53.08238	16.4	-	-	-	-	-
	3	Sand & Gravel	18/07/2012	12:59:27	-5.82842	53.08178	16.5	11	Sand/Gravel		Gravelly	Y
24a	1	Sand 5cm	18/07/2012	13:09:02	-5.84763	53.0971	15.5	5	Sand/Gravel		Gravelly/ Sand	Y
	2	Sand 2cm	18/07/2012	13:10:26	-5.84792	53.0964	15.5	-	-	-	-	-
24b	3	Rock	18/07/2012	13:11:36	-5.84823	53.0958	15.5	4	Cobble/Gravel		Gravelly	N
25	1	Rock in jaws	18/07/2012	13:16:52	-5.86303	53.09815	15.6	-	-	-	-	-
	2	Rocks	18/07/2012	13:18:11	-5.86348	53.09768	14.7	3	Cobble/Gravel	Ophiothrix	Gravelly	N
5	1	Sand uneven bite	18/07/2012	13:32:26	-5.89663	53.05687	23.8	-	-	-	-	-
	2	Sample	18/07/2012	13:37:13	-5.89742	53.05367	25.4	8	Sand/Gravel		Gravelly/ Sand	Y
4	1	Sample	18/07/2012	13:44:27	-5.88702	53.039	7.6	7	Sand/Gravel		Gravelly/ Sand	Y
6	1	Empty	18/07/2012	13:54:21	-5.85662	53.04545	21	-	-	-	-	-
	2	1 stone	18/07/2012	13:55:36	-5.85618	53.0446	21.6	-	-	-	-	-
	3	1 stone	18/07/2012	13:56:54	-5.85587	53.04358	21.2		Cobble/Gravel		Gravelly	N
7	1	Rocks	18/07/2012	14:06:01	-5.82015	53.0491	21.3	-	-	-	-	-
	2	Stone in jaw	18/07/2012	14:07:11	-5.82005	53.0484	16.1	-	-	-	-	-

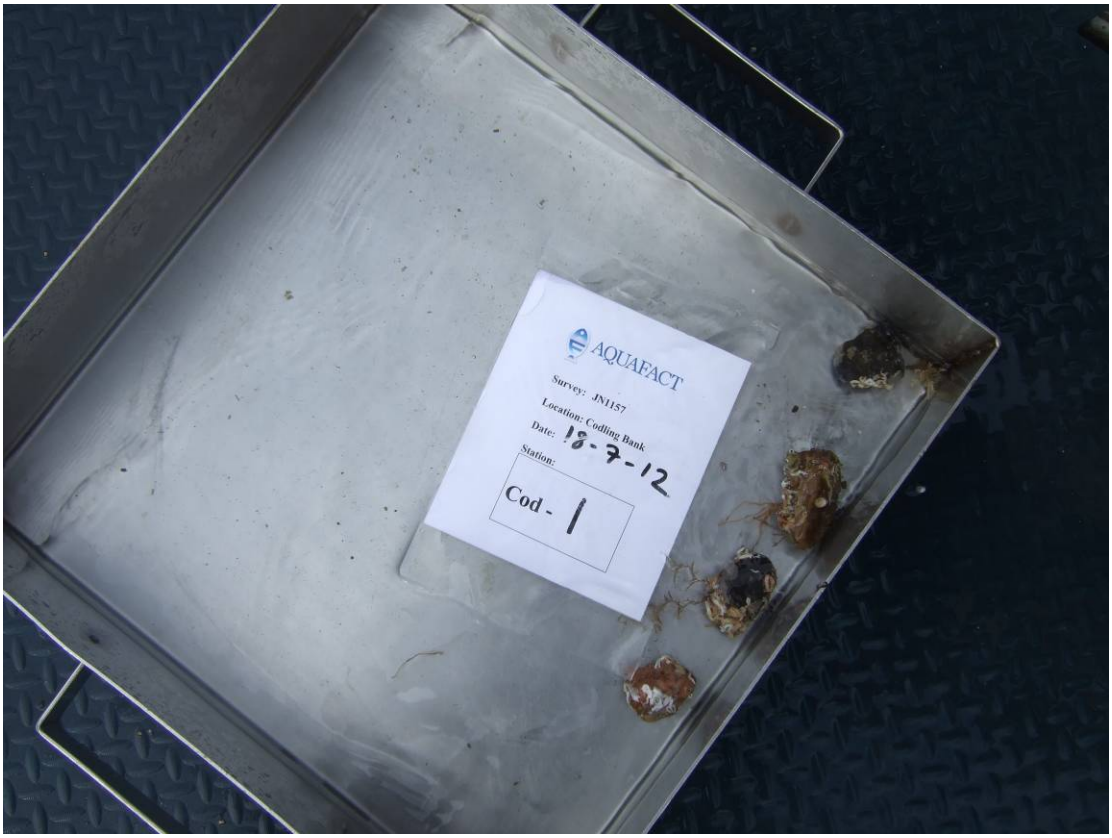
Station	Attempt	Outcome	Date	Time	Longitude	Latitude	Depth (m)	Penetration (cm)	Sediment Type	Fauna	Sandbank Type	Sediment Sample
	3	Stone in jaw	18/07/2012	14:08:21	-5.81995	53.04763	16.1		Cobble/Gravel	Psammechinus, Mytilus	Gravelly	N


Grab Attempt
Grab Venting
Insufficient Penetration
Uneven Bite
Empty
Sand
Sand/Gravel
Sand/Gravel (Shell)
Gravel
Gravel (Shell)
Cobble/Gravel
Cobble/Gravel/Sand
40
39
38
37
36
35
34
33
32
31
30
BRAY
BANK
CODLING
Fl(2)R.10s
East Kish
Fl(4)R.10s
East Codling
kilometers
N


Grab Attempt
Grab Venting
Insufficient Penetration
Uneven Bite
Empty
Sand
Sand/Gravel
Sand/Gravel (Shell)
Gravel
Gravel (Shell)
Cobble/Gravel
Cobble/Gravel/Sand
N
kilometers
53°00´N
5°45´W
South Ridge
India Bank
Q(6)+LFl.15s
India South
VQ(6)+LFl.10s
South Codling
Q(3)10s
Codling
Racon (G)
AIS


Grab Attempt
Grab Venting
Insufficient Penetration
Uneven Bite
Empty
Sand
Sand/Gravel
Sand/Gravel (Shell)
Gravel
Gravel (Shell)
Cobble/Gravel
Cobble/Gravel/Sand
CODLING BANK
West Codling
South Codling
South Ridge
India Bank
India South
India No
Codling
Racon (G)
AIS
kilometers
N

Appendix 2
Photographic Sample Log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Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 1

Cod – 1


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 2
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 2

Cod – 2


Date:
Station:
Cod - 3
Survey: JN1157
Location: Codling Bank
Date:
Station:
Cod - 3

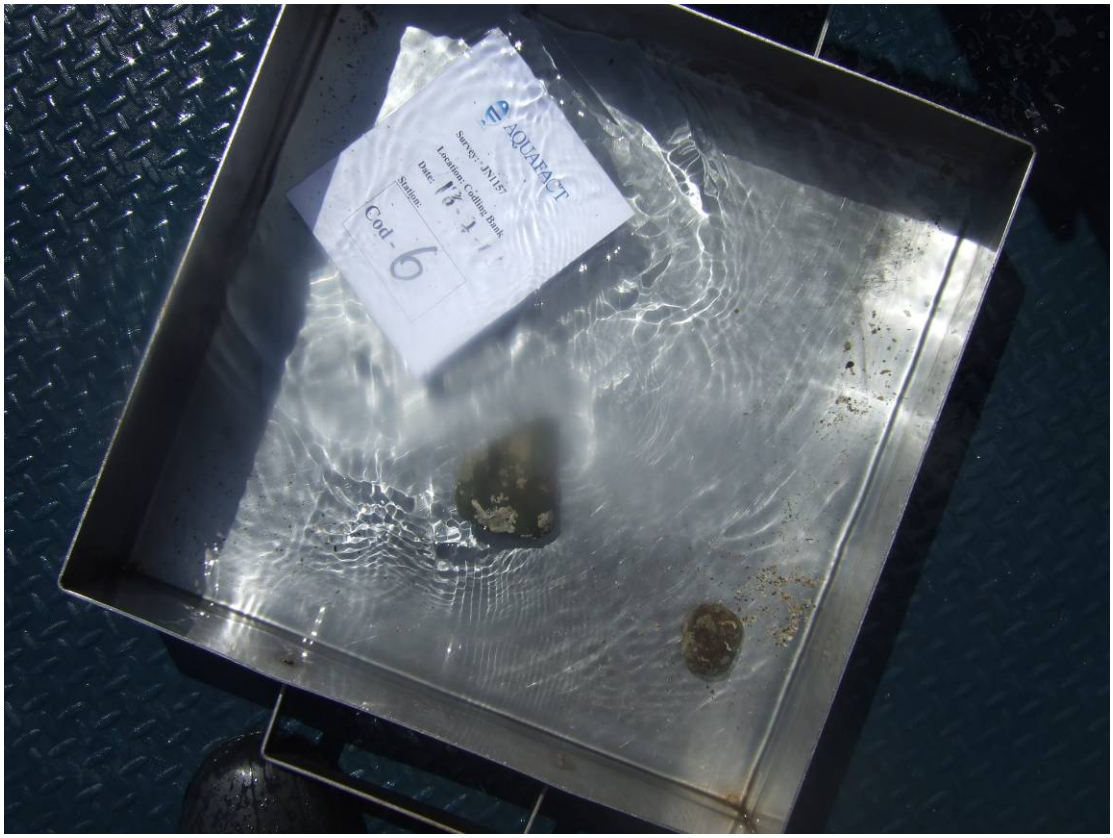
Cod – 3


AQUAFACT
Survey: JN157
Location: Codling Bank
Date:
Station:
Cod- 4
AQUAFACT
Cod - 4

Cod – 4


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 5

Cod – 5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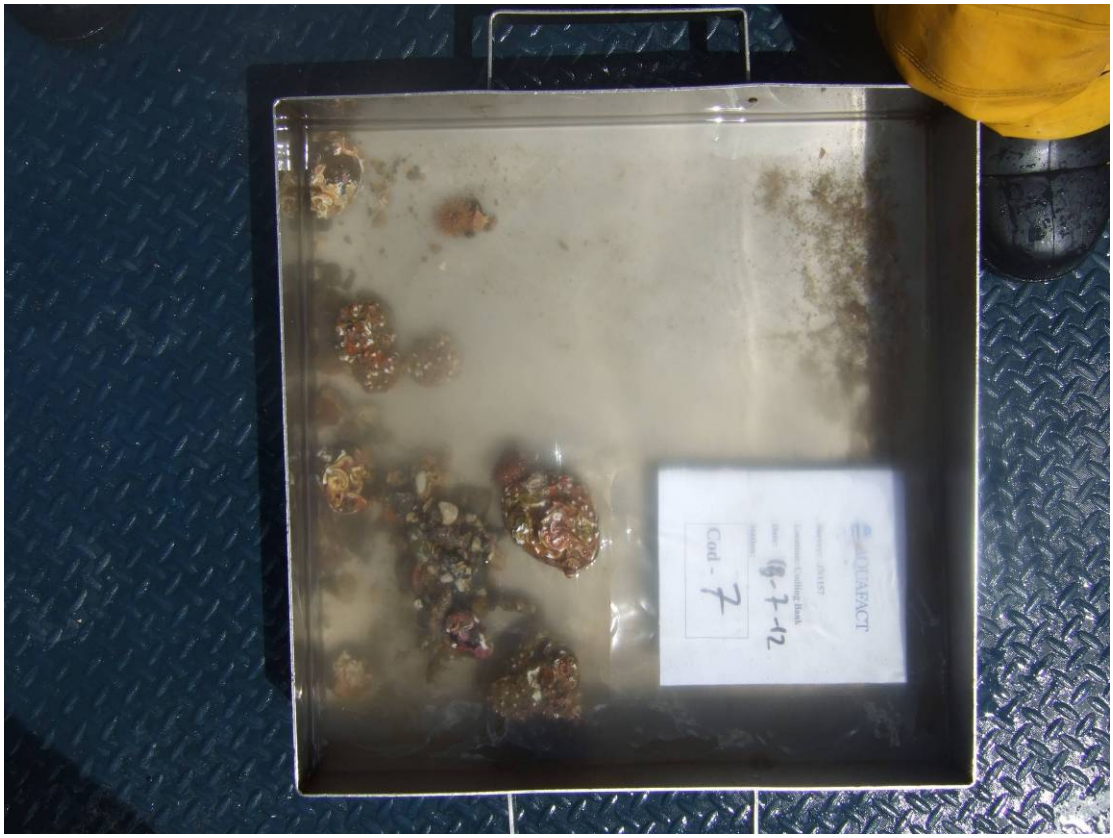
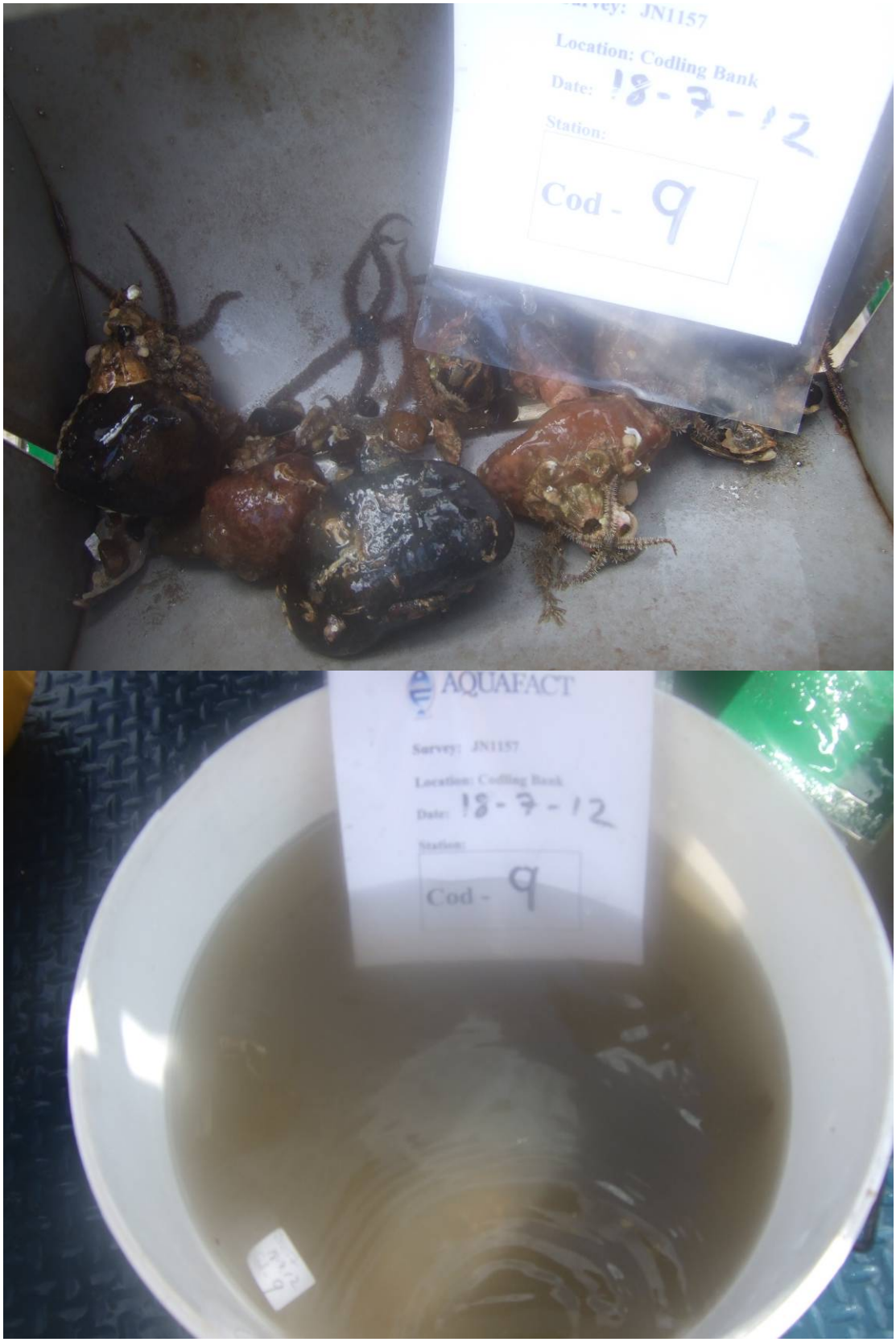
Survey: JV157
Location: Codling Bank
Date: 13-7-12
Station:
Cod - 6

Cod – 6


AQUAFACT
Cod - 7

Cod – 7

Cod – 8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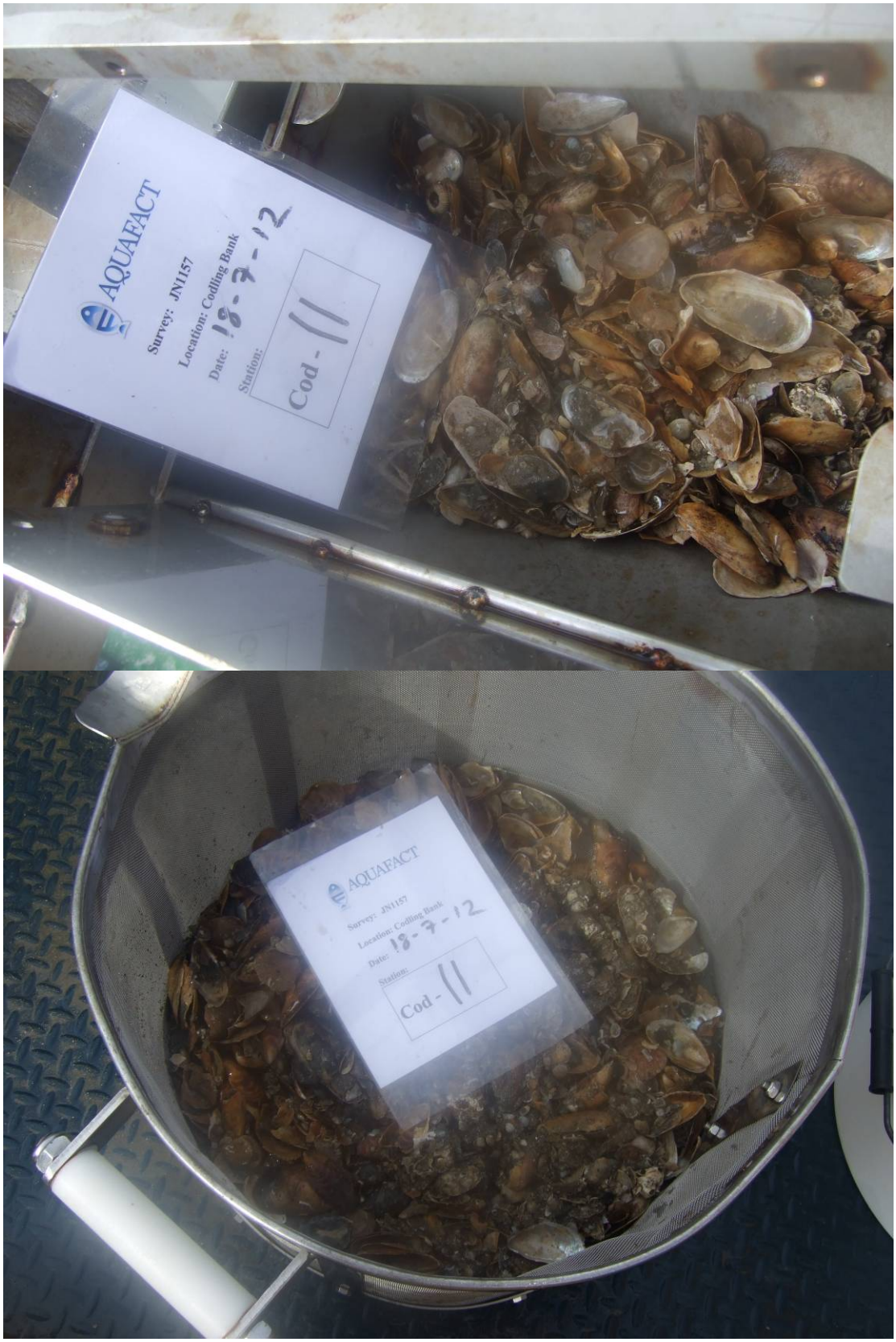
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 9
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 9

Cod – 9


Location: Codling Bank
Date: 18-7-12
Station:
Cod - 10
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 10
10

Cod – 10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Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 11
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 11

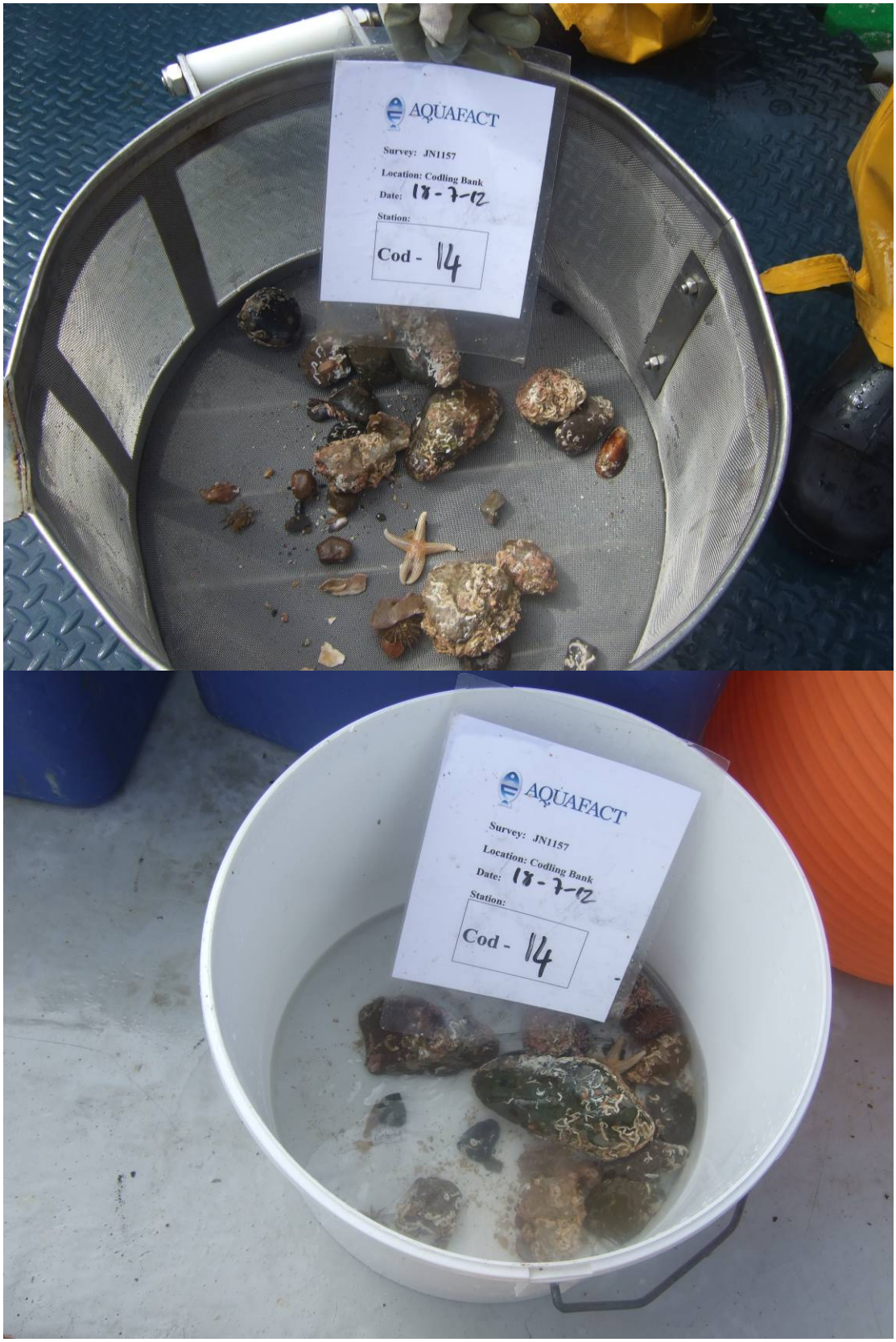
Cod – 11


Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 12
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 12

Cod – 12


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 13
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 13

Cod – 13


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 14
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 14

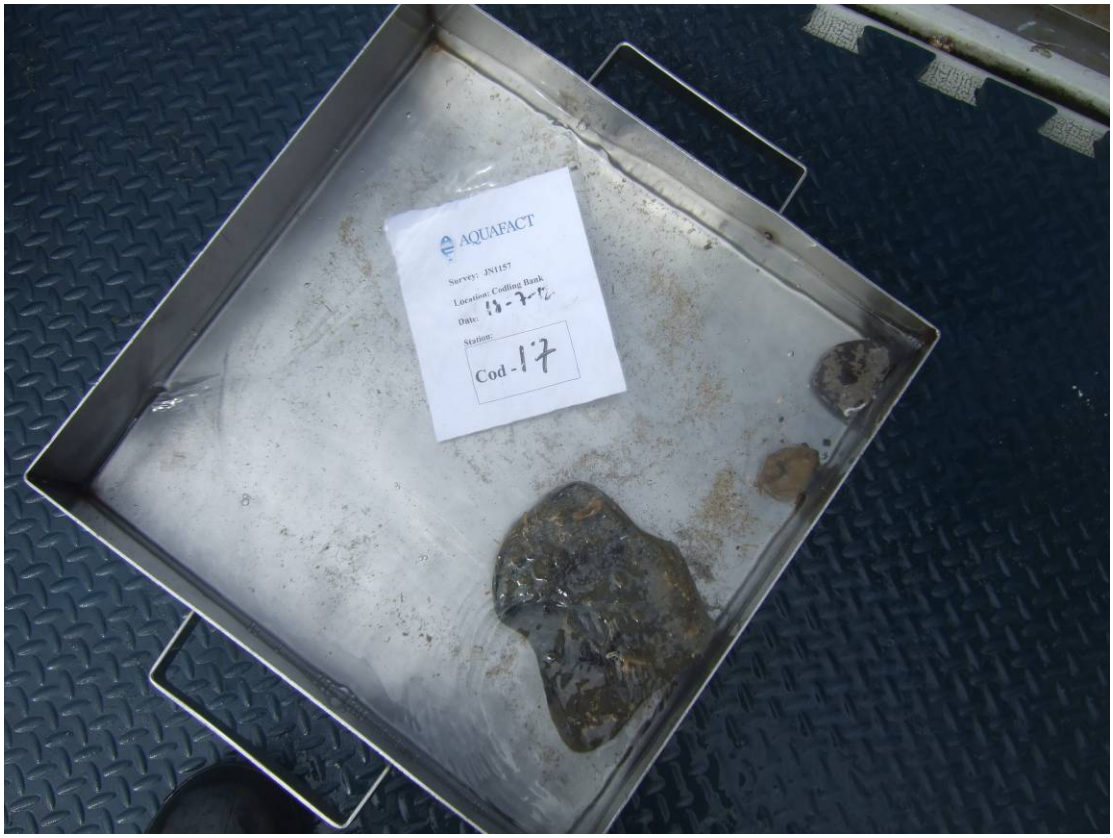
Cod – 14


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 15
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 15

Cod – 15


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 13-7-12
Station:
Cod - 16
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 13-7-12
Station:
Cod - 16

Cod – 16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Location: Codling Bank
Date: 13-7-12
Station:
Cod - 17

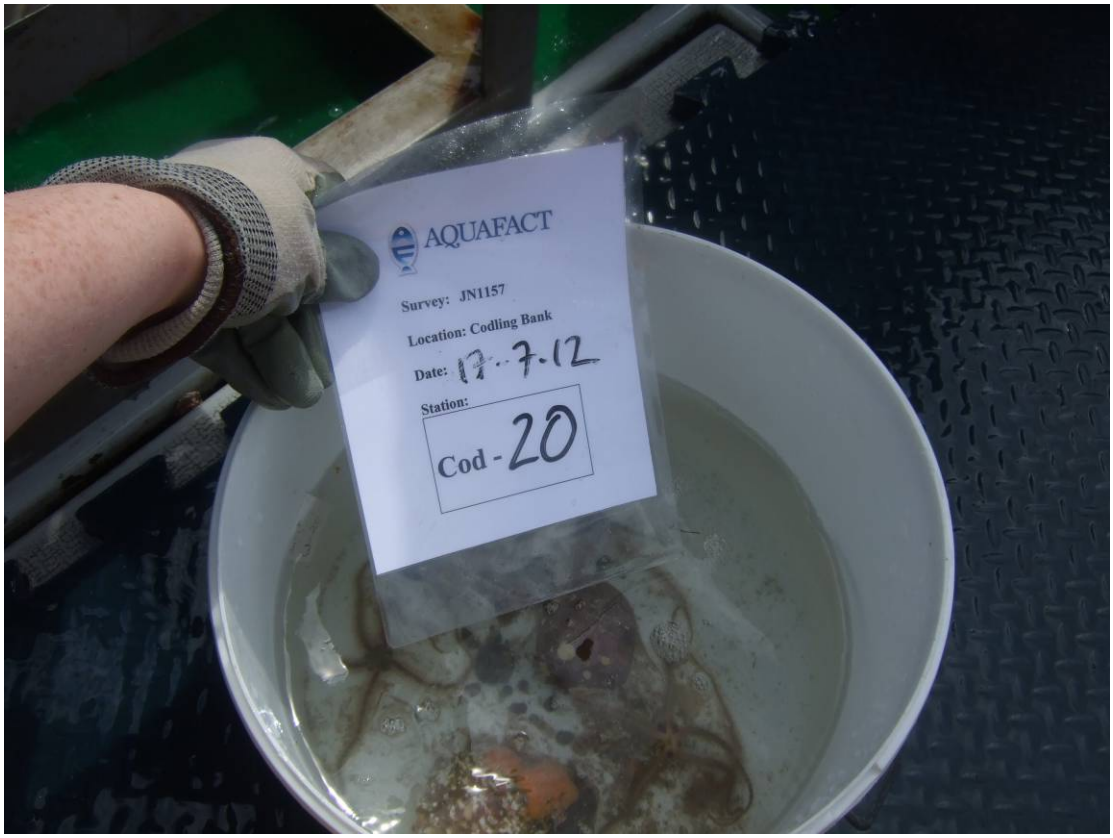
Cod – 17


Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 18
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 18

Cod – 18


AQUAFACT
Survey: JN157
Location: Codling Bank
Date:
Station:
Cod - 19
Survey:
Location: Codling Bank
Date:
Station:
Cod - 19

Cod – 19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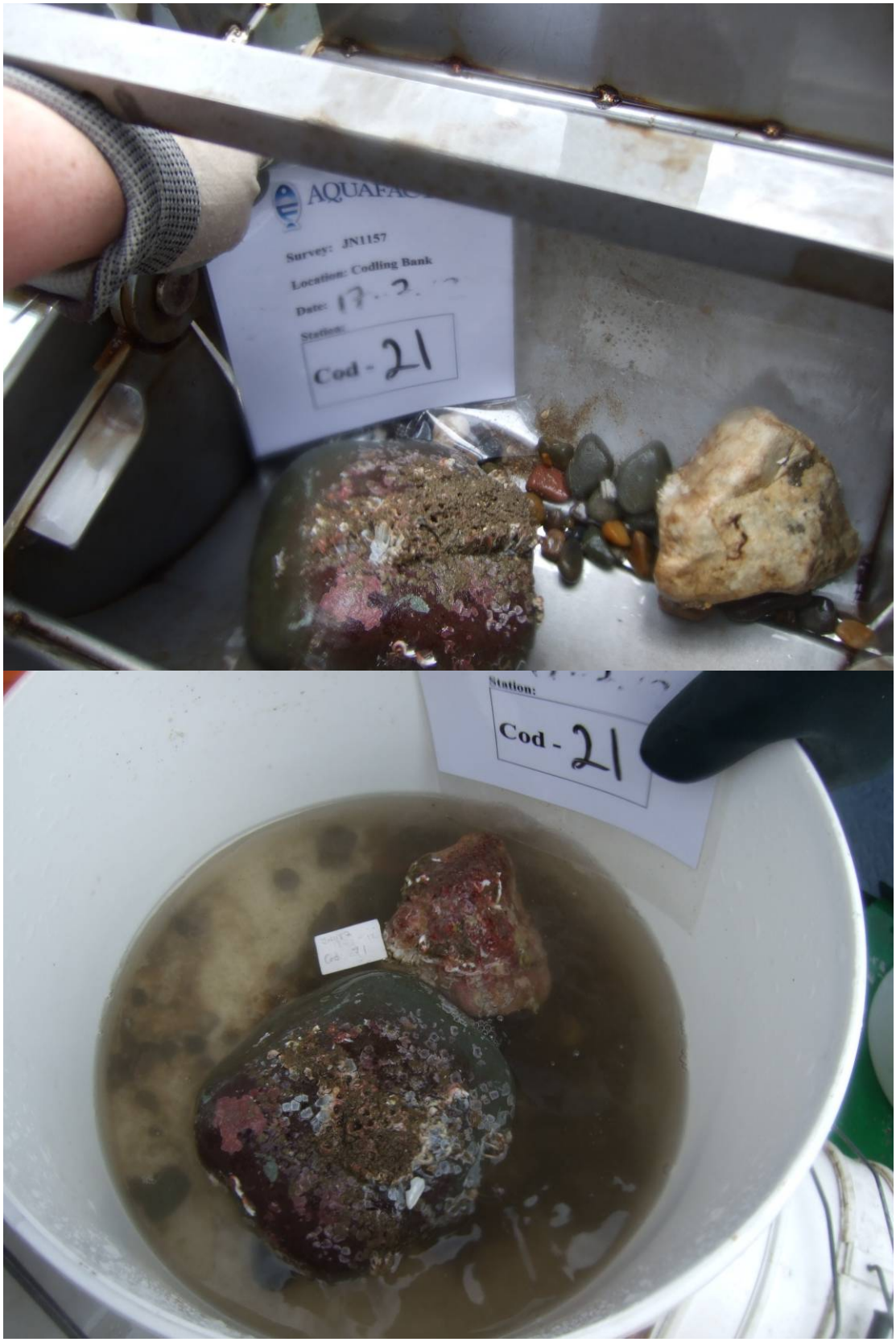
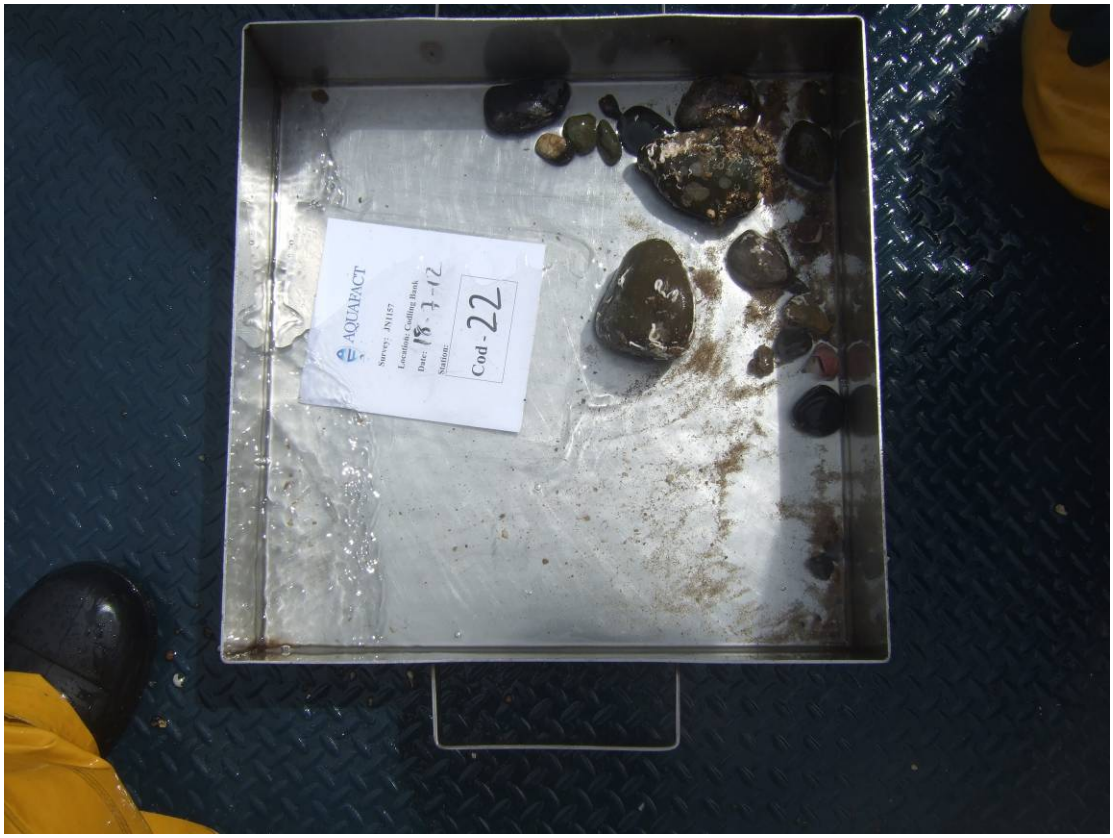
Survey: JN1157
Location: Codling Bank
Date: 17.7.12
Station:
Cod - 20

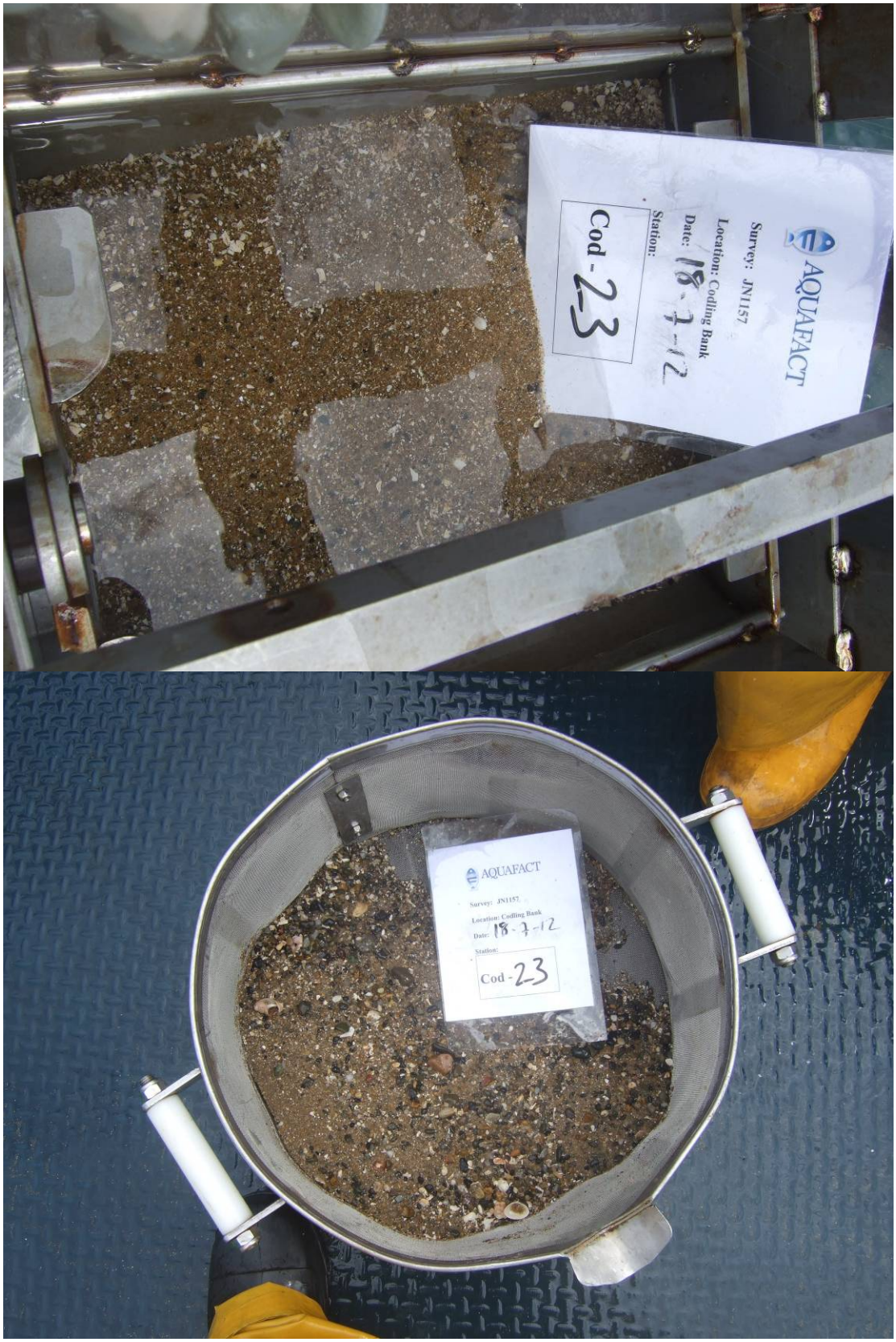
Cod – 20


Survey: JN1157
Location: Codling Bank
Station:
Cod - 21
Station:
Cod - 21

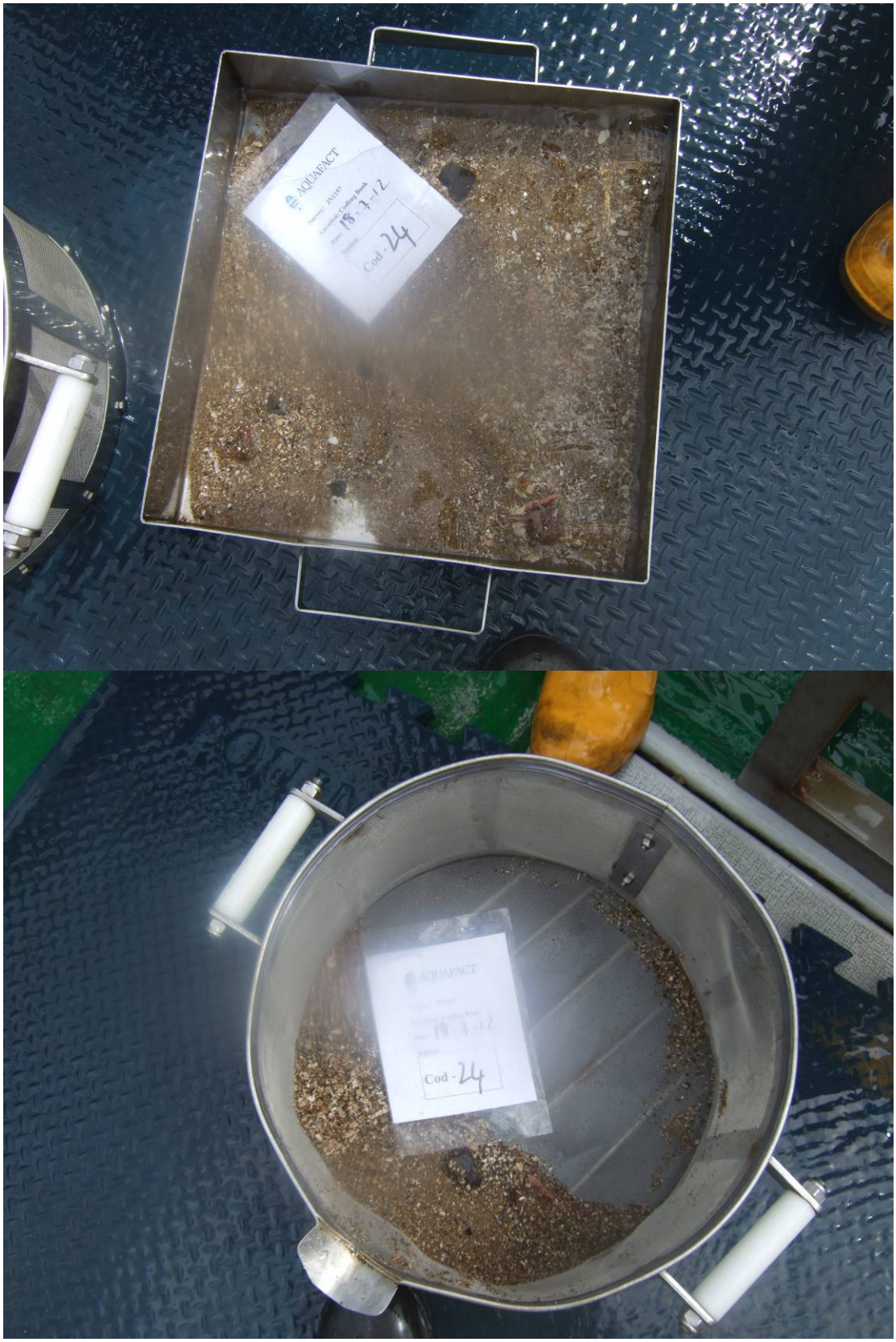
Cod – 21


AQUAFACT
Survey: JN157
Location: Galling Bank
Date: 18-7-12
Station:
Cod - 22

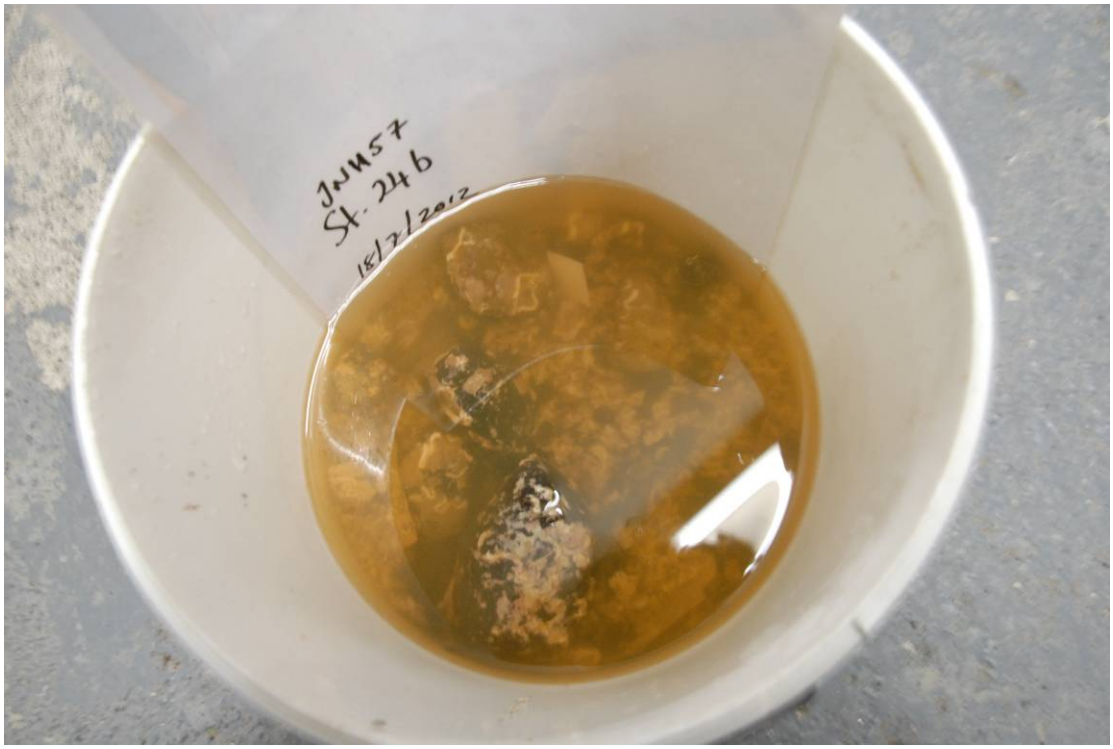
Cod – 22


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod -23
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod -23

Cod – 23



Cod – 24a



Cod – 24b


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 25
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 18-7-12
Station:
Cod - 25

Cod – 25


AQUAFACT
Survey: JN1157
Location: Codling Bank
Station:
Cod - 26

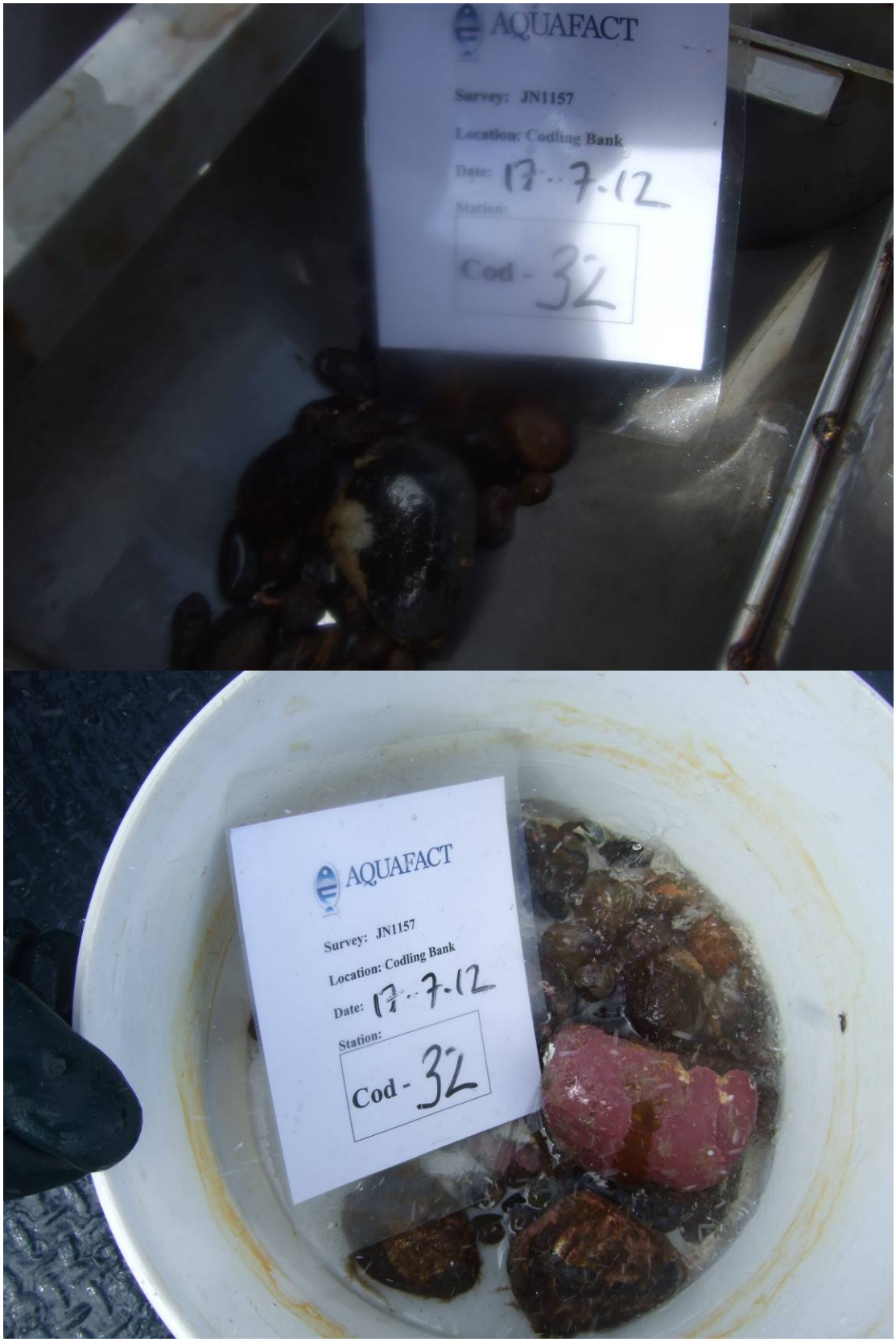
Cod – 26


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date:
Station:
Cod -29
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date:
Station:
Cod -29

Cod – 29


AQUAFACT
Survey: JN1157
Location: Codling
Date: 17-7-12
Station:
Cod - 31
AQUAFACT
Survey: JN1157
Location: Codling
Date: 17-7-12
Station:

Cod – 31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Location: Codling Bank
Date: 17-7-12
Station:
Cod - 32
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 17-7-12
Station:
Cod - 32

Cod – 32


AQUAFACT
Survey: JN157
Location: Codling
Date: 17-7-12
Station:
Cod - 33
AQUAFACT
Survey: JN157
Location: Codling
Date: 17-7-12
Station:
Cod - 33

Cod – 33


Survey: JN1157
Location: Codling Bank
Date: 11-7-12
Station:
Cod - 34
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 11-7-12
Station:
Cod - 34

Cod – 34


QUAFACT
Survey: JN1157
Location: Codling
Date: 17-7-12
Station:
Cod - 35
AQUAFACT
Survey: JN1157
Location: Codling
Date: 17-7-12
Station:
Cod - 35

Cod – 35

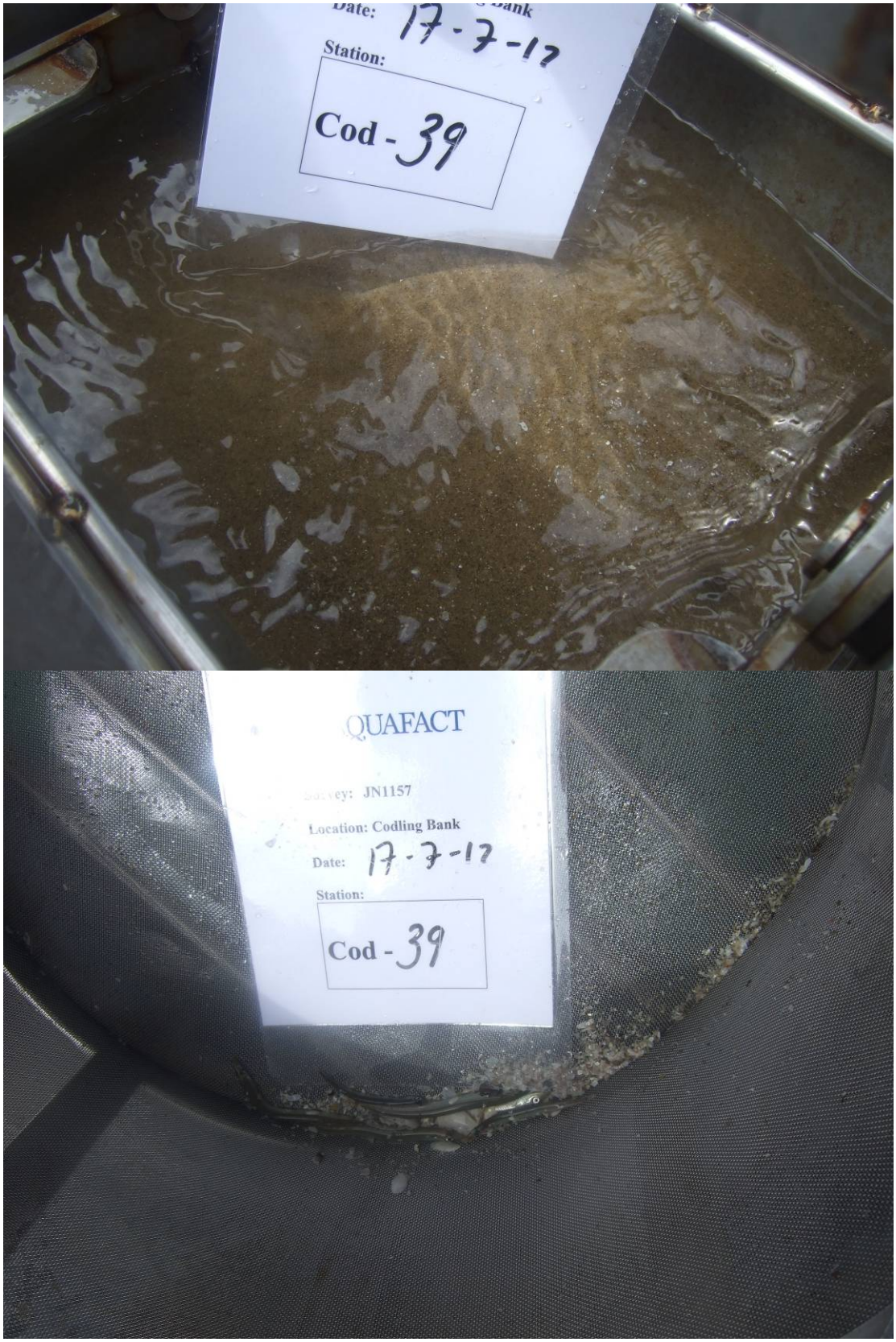
Cod – 36


AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 17-7-17
Station:
Cod - 37
AQUAFACT
Survey: JN1157
Location: Codling Bank
Date: 17-7-17
Station:
Cod - 37

Cod – 37


Survey: JN1157
Location: Codling
Date: 17-7-12
Station:
Cod - 38
AQUAFACT
Survey: JN1157
Location: Codling
Date: 17-7-12
Station:
Cod - 38

Cod – 38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Station:
Cod - 39
QUAFACT
Location: Codling Bank
Date: 17-7-17
Station:
Cod - 39

Cod – 39


Location: Codling
Date: 17-7-12
Station:
Cod - 40
AQUAFACT
Survey: JN1157
Location: Codling
Date: 17-7-12
Station:
Cod - 40

Cod – 40

Appendix 3

Sediment Analysis Methodologies

Granulometry

1. Approximately 25g of dried sediment is weighed out and placed in a labelled 1L glass beaker to which 100 ml of a 6 percent hydrogen peroxide solution was then added. This was allowed to stand overnight in a fume hood.
2. The beaker is placed on a hot plate and heated gently. Small quantities of hydrogen peroxide are added to the beaker until there is no further reaction. This peroxide treatment removes any organic material from the sediment which can interfere with grain size determination.
3. The beaker is then emptied of sediment and rinsed into a. 63µm sieve. This is then washed with distilled water to remove any residual hydrogen peroxide. The sample retained on the sieve is then carefully washed back into the glass beaker up to a volume of approximately 250ml of distilled water.
4. 10ml of sodium hexametaphosphate solution is added to the beaker and this solution is stirred for ten minutes and then allowed to stand overnight. This treatment helps to dissociate the clay particles from one another.
5. The beaker with the sediment and sodium hexametaphosphate solution is washed and rinsed into a 63µm sieve. The retained sampled is carefully washed from the sieve into a labelled aluminium tray and placed in an oven for drying at 100ºC for 24 hours.
6. When dry this sediment is sieved through a series of graduated sieves ranging from 4 mm down to 63µm for 10 minutes using an automated column shaker. The fraction of sediment retained in each of the different sized sieves is weighed and recorded.
7. The silt/clay fraction is determined by subtracting all weighed fractions from the initial starting weight of sediment as the less than 63µm fraction was lost during the various washing stages.

Organic Content

1. The collected sediments should be transferred to aluminium trays, homogenised by hand and dried in an oven at 100º C for 24 hours.
2. A sample of dried sediment should be placed in a mortar and pestle and ground down to a fine powder.
3. 1g of this ground sediment should be weighed into a pre-weighed crucible and placed in a muffle furnace at 450ºC for a period of 6 hours.
4. The sediment samples should be then allowed to cool in a dessicator for 1 hour before being weighed again.
5. The organic content of the sample is determined by expressing as a percentage the weight of the sediment after ignition over the initial weight of the sediment.

Appendix 4
Voucher Reference Collection

VOUCHER COLLECTION AS OF (02/1/'12) FOR GREATER CODLING BANK (SAMPLED 17TH AND 18TH JULY 2012)

1. *Abietinaria abietina*
2. *Abra alba*
3. *Acanthochitona crinita*
4. *Acanthochitona sp. (juvenile)*
5. *Actiniaria sp. (juvenile)*
6. *Aglaophamus agilis*
7. *Alcyonidium cf mytili*
8. *Alcyonidium diaphanum*
9. *Alcyonium digitatum*
10. *Alteutha oblonga*
11. *Amblyosyllis formosa*
12. *Amenophia pulchella*
13. *Ammodytes tobianus*
14. *Ampelisca diadema*
15. *Amphipholis squamata*
16. *Anapagurus hyndmanni*
17. *Anomiidae sp. (juvenile)*
18. *Antedon bifida*
19. *Anthura gracilis*
20. *Aonides oxycephala*
21. *Artotrogus orbicularis*
22. *Ascidiella aspersa*
23. *Ascleroceilus intermedius*
24. *Asterias rubens*
25. *Balanidae sp. (juvenile)*
26. *Balanus balanus*
27. *Balanus crenatus*
28. *Bicellariella ciliata*
29. *Bodotria scorpioides*
30. *Brania pusilla*
31. *Buccinum undatum*
32. *Bugula flabellata*
33. *Calliostoma zizyphinum*
34. *Caprella linearis*
35. *Cheirocratus intermedius*
36. *Cheirocratus sp. (female)*
37. *Cheirocratus sundevalli*
38. *Circeis spirillum*
39. *Clausinella fasciata*
40. *Cliona celata*
41. *Clytia hemisphaerica*
42. *Crisia eburnea*
43. *Cyclostomatida sp. (indet)*
44. *Cylichna cylindracea*
45. *Cymodoce truncata*
46. *Dendrodoa grossularia*
47. *Didemnum maculosum*
48. *Dipolydora caulleryi*

49. *Dipolydora coeca*
50. *Dipolydora flava*
51. *Disporellla hispida*
52. *Dodecaceria sp. (partial/damaged)*
53. *Doto pinnatifida*
54. *Electra pilosa*
55. *Enchytraeidae sp. (indet)*
56. *Epigamia alexandri*
57. *Ericthonius punctatus*
58. *Erinaceusyllis erinaceus*
59. *Escharella immersa*
60. *Escharella ventricosa*
61. *Eteone longa/flava aggregate*
62. *Eualus pusiolus*
63. *Eucratea loricata*
64. *Eudorellopsis deformis*
65. *Eulalia aurea*
66. *Eulalia bilineata*
67. *Eulalia ornata*
68. *Eumida sanguinea complex*
69. *Eurydice pulchra*
70. *Eurydice spinigera*
71. *Euspira pulchella*
72. *Eusyllis blomstrandi*
73. *Flustra foliacea*
74. *Galathea sp. (juvenile)*
75. *Gammaropsis nitida*
76. *Gari tellinella*
77. *Gibbomodiola adriaticus*
78. *Gibbula cineraria*
79. *Gibbula tumida*
80. *Glycera lapidum*
81. *Glycera oxycephala*
82. *Gnathia oxyuraea*
83. *Gnathia sp. (juvenile)*
84. *Golfingia (Golfinia) elongata*
85. *Goniodoris nodosa*
86. *Goodallia triangularis*
87. *Harmothoe sp. (partial/damaged)*
88. *Hesionura elongata*
89. *Hiatella arctica*
90. *Hiatella rugosa*
91. *Hyas coarctatus*
92. *Hydrallmania falcata*
93. *Hydroides norvegica*
94. *Iphimedia perplexa*
95. *Janira maculosa*
96. *Jassa herdmani*
97. *Kirchenpaueria pinnata*
98. *Kurtiella bidentata*
99. *Lacuna crassior*

100. *Lanice conchilega*
101. *Lepidonotus squamatus*
102. *Leptocheirus hirsutimanus*
103. *Leptochiton asellus*
104. *Leptosynapta minuta*
105. *Leucosolenia sp. (indet)*
106. *Liljeborgia pallida*
107. *Lumbriclymene minor*
108. *Lumbrineris near cingulata*
109. *Lutraria angustior*
110. *Mediomastus fragilis*
111. *Membraniporella nitida*
112. *Mesnilia sp. (partial/damaged)*
113. *Molgula occulta*
114. *Monia patelliformis*
115. *Monia squama*
116. *Monocorophium sextonae*
117. *Musculus discors*
118. *Mya arenaria*
119. *Myrianida brachycephala*
120. *Myrianida langerhansi*
121. *Myrianida sp. (partial/damaged)*
122. *Mytilidae sp. (juvenile)*
123. *Nassarius incrassatus*
124. *Nassarius reticulatus*
125. *Nematoda sp. (indet)*
126. *Nematonereis unicornis*
127. *Nemertea sp. (indet)*
128. *Nephtys cirrosa*
129. *Nepinnotheres pinnotheres*
130. *Nereimyra punctata*
131. *Nereis pelagica*
132. *Notomastus latericeus*
133. *Nucula nucleus*
134. *Nucula sp. (juvenile)*
135. *Nymphon brevitarse*
136. *Nymphon grossipes*
137. *Obelia geniculata*
138. *Ocenebra erinacea*
139. *Odostomia unidentata*
140. *Okenia sp. (partial/damaged)*
141. *Ondina diaphana*
142. *Ondina divisa*
143. *Onoba semicostata*
144. *Ophelia borealis*
145. *Ophelia sp. (juvenile)*
146. *Ophiocomina nigra*
147. *Ophiothrix fragilis*
148. *Othomaera othonis*
149. *Paguridae sp. (juvenile)*
150. *Paradoneis lyra*

151. *Parapleustes bicuspis*
152. *Perioculodes longimanus*
153. *Phascolion (Phascolion) strombus strombus*
154. *Pholoe inornata*
155. *Phoronis sp. (indet)*
156. *Phtisica marina*
157. *Pilumnus hirtellus*
158. *Pisidia longicornis*
159. *Pisione remota*
160. *Polycarpa pomaria*
161. *Polycirrus sp. A*
162. *Polynoe scolopendrina*
163. *Pomatoceros lamarcki*
164. *Pomatoceros triqueter*
165. *Prosphaerosyllis tetralix*
166. *Protodorvillea kefersteini*
167. *Psammechinus miliaris*
168. *Psamthe fusca*
169. *Pseudoparatanais batei*
170. *Pseudopolydora pulchra*
171. *Pseudopotamilla reniformis*
172. *Pygospio elegans*
173. *Retusa truncatula*
174. *Sabellaria alveolata*
175. *Sabellaria spinulosa*
176. *Sabellidae sp. (juvenile)*
177. *Saccocirrus papillocercos*
178. *Scalibregma celticum*
179. *Schistomeringos neglecta*
180. *Scoloplos armiger*
181. *Scruparia sp. (partial/damaged)*
182. *Scrupocellaria scruposa*
183. *Sphaerosyllis bulbosa*
184. *Spiophanes bombyx*
185. *Spisula elliptica*
186. *Spisula solida*
187. *Spisula sp. (juvenile)*
188. *Spisula subtruncata*
189. *Streptosyllis bidentata*
190. *Subadyte pellucida*
191. *Sycon ciliatum*
192. *Syllides japonicus*
193. *Syllis armillaris*
194. *Syllis sp. D (after Garwood)*
195. *Syllis sp. E (after Garwood)*
196. *Syllis sp. H (after Garwood)*
197. *Syllis variegata*
198. *Tectura virginea*
199. *Tellimya ferruginosa*
200. *Thalestris longimana*
201. *Thelepus setosus*

202. *Thracia sp. (juvenile)*
203. *Timoclea ovata*
204. *Tricolia pullus*
205. *Tunicata sp. (indet.)*
206. *Turbellaria sp. (indet)*
207. *Turbicellepora avicularis*
208. *Unicola crenatipalma*
209. *Urothoe brevicornis*
210. *Urothoe elegans*
211. *Verruca stroemia*
212. *Zaus goodsiri*

Appendix 5
Faunal Abundance

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
PORIFERA	C	1																			
CALCAREA	C	2																			
LEUCOSOLENIDA	C	49																			
Leucosoleniidae	C	50																			
Leucosolenia sp. (indet)	C	53										+									
Sycettidae	C	126																			
Sycon ciliatum	C	133										+				+					
DESMOSPONGIAE	C	152																			
HADROMERIDA	C	317																			
Polymastiidae	C	350																			
Clionidae	C	471																			
Cliona celata	C	480									+					+					
CNIDARIA	D	1																			
HYDROZOA	D	58																			
CONICA	D	296																			
Sertulariidae	D	407																			
Sertulariidae sp. (partial/damaged)	D	407						+			+		+		+	+	+				+
Abietinaria abietina	D	409			+	+						+					+				+
Hydrallmania falcata	D	424	+	+						+					+						+
Sertularia sp. (partial/damaged)	D	433																			+
Plumulariidae	D	447																			
Kirchenpaueria pinnata	D	455																	+		
PROBOSCOIDA	D	488																			
Campanularidae	D	491																			
Campanularidae sp. (partial/damaged)	D	491																			
Clytia hemisphaerica	D	503															+				
Obelia geniculata	D	520																	+		
ANTHOZOA	D	583																			
OCTOCORALLIA	D	584																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
ALCYONACEA	D	594																			
Alcyoniidae	D	596																			
Alcyonium digitatum	D	597									+	+									
HEXACORALLIA	D	627																			
ACTINIARIA	D	662																			
Actiniaria sp. (juvenile)	D	662									2			2				1			1
Actiniaria sp. (indet)	D	662														1					
PLATYHELMINTHES	F	1																			
TURBELLARIA	F	2																			
Turbellaria sp. (indet)	F	2																			
NEMATODA	HD	1																			
Nematoda sp. (indet)	HD	1	3	49	2		1		13	12	7	19	12	8	37	68	9			17	1
NEMERTEA	G	1																			
Nemertea sp. (indet)	G	1		2					2		2		1		1	1	2				
SIPUNCULA	N	1																			
SIPUNCULIDEA	N	2																			
GOLFINGIIFORMES	N	10																			
Golfingiidae	N	11																			
Golfingiidae sp. (juvenile)	N	11							23	2	2	5		23	1	10					2
Golfingiidae sp. (partial/damaged)	N	11		1									3			5					
Golfingia (Golfinia) elongata	N	14											9				1				1
Phascolionidae	N	29																			
Phascolion (Phascolion) strombus strombus	N	34											2	2	1						
ANNELIDA	P	1																			
POLYCHAETA	P	2																			
PHYLLODOCIDA	P	3																			
Pisionidae	P	13																			
Pisione sp. (partial/damaged)	P	14					1														
Pisione remota	P	15		7			1													34	
Polynoidae	P	25																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Polynoidae sp. (partial/damaged)	P	25							2	1		1	1			1	1				
Polynoidae sp. (juvenile)	P	25																			
Subadyte pellucida	P	32									1										1
Harmothoe sp. (partial/damaged)	P	50	3	3						2	3	2	2	4	3		1				1
Lepidonotus sp. (partial/damaged)	P	80												1	1	1					
Lepidonotus squamatus	P	83	1						7		4	2	1	7	1	1					
Polynoe scolopendrina	P	84							1			1					1				
Pholoidae	P	90																			
Pholoe sp. (partial/damaged)	P	91	1													2					
Pholoe inornata	P	92						1	7		5	3	2	13	1	6	2				
Sigalionidae	P	96																			
Sigalionidae sp. (partial/damaged)	P	96																			
Phyllodocidae	P	114																			
Phyllodocidae sp. (partial/damaged)	P	114	2	7					14	3	3	3	1	4	1	7	1				4
Phyllodocidae sp. (juvenile)	P	114																			
Eteone longa/flava aggregate	P	118																			
Hesionura elongata	P	122		3																	
Eulalia sp. (partial/damaged)	P	150							1						1						1
Eulalia sp. (juvenile)	P	150																			
Eulalia aurea	P	151							3					1		2					
Eulalia bilineata	P	152									1										
Eulalia ornata	P	156							1							1					
Eumida sp. (partial/damaged)	P	163								1											
Eumida sp. (juvenile)	P	163		6																	
Eumida sanguinea complex	P	167	1									2									
Phyllodoce sp. (partial/damaged)	P	178														1					

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Glyceridae	P	254																			
Glycera sp. (partial/damaged)	P	255					1										1				
Glycera sp. (juvenile)	P	255			1																
Glycera lapidum	P	260		2	2								1					1		3	1
Glycera oxycephala	P	262					1														
Hesionidae	P	293																			
Hesionidae sp. (partial/damaged)	P	293		1										1							
Psamthe fusca	P	305							1	1	3										
Nereimyra punctata	P	311																			
Syllidae	P	346																			
Syllidae sp. (partial/damaged)	P	346												1							
Syllis sp. D (after Garwood)	P	358	1							1											
Syllis sp. E (after Garwood)	P	358										1	2	1	4		1				
Syllis sp. H (after Garwood)	P	358		17	4															2	
Syllis sp. (partial/damaged)	P	358								2				1		4	1				
Syllis armillaris	P	365							26	3	8	2	8	13	4	8	2			1	2
Syllis variegata	P	371							3			4		1	1	2	5				
Eusyllinae sp. (partial/damaged)	P	373										1					1				
Amblyosyllis formosa	P	375																		1	
Eusyllis blomstrandi	P	380										1		6							
Streptosyllis bidentata	P	403		2																	
Syllides japonicus	P															1					
Exogoninae	P	410																			
Exogoninae sp. (partial/damaged)	P	410																		1	
Brania pusilla	P	414							1												
Sphaerosyllis bulbosa	P	425		35											1					1	
Erinaceusyllis erinaceus	P	426														1					
Prosphaerosyllis tetralix	P	431															1				
Autolytinae sp. (partial/damaged)	P	433									3						1				

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Myrianida sp. (partial/damaged)	P	434	1						4												
Myrianida sp. (juvenile)	P	434															2				
Epigamia alexandri	P	435										1									
Myrianida brachycephala	P	437																			
Myrianida langerhansi	P	440																			
Nereididae	P	458																			
Nereididae sp. (juvenile)	P	458													2						
Nereididae sp. (partial/damaged)	P	458														1					
Nereis pelagica	P	476										2									
Nephtyidae	P	490																			
Nephtyidae sp. (juvenile)	P	490																			
Aglaophamus sp. (partial/damaged)	P	491					1														
Aglaophamus agilis	P	493																			
Nephtys sp. (partial/damaged)	P	494																			
Nephtys sp. (juvenile)	P	494											1								
Nephtys cirrosa	P	498																			
EUNICIDA	P	536																			
Eunicidae	P	553																			
Nematonereis unicornis	P	568																			
Lumbrineridae	P	569																			
Lumbrineridae sp. (partial/damaged)	P	569																			
Lumbrineris sp. (juvenile)	P	572										1	3	6							
Lumbrineris near cingulata	P												1	1							
Dorvilleidae	P	598																			
Ophryotrocha sp. (partial/damaged)	P	613																		1	
Protodorvillea kefersteini	P	638												1							
Schistomeringos neglecta	P	642																			
ORBINIIDA	P	654																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Orbiniidae	P	655																			
Scoloplos armiger	P	672												1							
Paraonidae	P	674																			
Paradoneis lyra	P	699											1				1				
SPIONIDA	P	707																			
Spionidae	P	720																			
Spionidae sp. (partial/damaged)	P	720										1	1		2			2			
Aonides oxycephala	P	722															1				
Laonice sp. (partial/damaged)	P	731								1											
Polydora sp. (partial/damaged)	P	748								4											
Dipolydora sp. (partial/damaged)	P								152	19	4	1	1	24		32					15
Dipolydora caulleryi	P	751							8	10			2	1		6					1
Dipolydora coeca	P	750							31	4	20	4	7	4		16	1				3
Dipolydora flava	P	754														5					
Pseudopolydora sp. (partial/damaged)	P	771								1											
Pseudopolydora pulchra	P	774								1						3					
Pygospio elegans	P	776														8	1				
Spiophanes bombyx	P	794																			
Cirratulidae	P	822																			
Cirratulidae sp. (partial/damaged)	P	822									1										
Cirratulus sp. (partial/damaged)	P																				
Dodecaceria sp. (partial/damaged)	P	840																			
CAPITELLIDA	P	902																			
Capitellidae	P	903																			
Capitellidae sp. (partial/damaged)	P	903															1				
Capitella sp. (indet)	P	906																			
Mediomastus fragilis	P	919							1				2	2			3				

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Notomastus latericeus	P	921																			
Maldanidae	P	938																			
Maldanidae sp. (partial/damaged)	P	938	1									1	1			2					
Lumbriclymene minor	P	942														34	4				
Euclymeninae sp. (partial/damaged)	P	951												1							
OPHELIIDA	P	992																			
Opheliidae	P	993																			
Ophelia sp. (juvenile)	P	997																			
Ophelia borealis	P	999																			
Scalibregmatidae	P	1020																			
Ascleroceilus intermedius	P	1022														1					
Scalibregma celticum	P	1026											1								
POLYGORDIIDA	P	1060																			
Polygordiidae	P	1061																			
Polygordius sp. (partial/damaged)	P	1062					1													1	
PROTODRILIDA	P	1067																			
Saccocirridae	P	1085																			
Saccocirrus papillocercos	P	1088																		3	
TEREBELLIDA	P	1099																			
Sabellariidae	P	1112																			
Sabellaria alveolata	P	1116																			
Sabellaria spinulosa	P	1117							10			4	5	1	2	3					
Terebellidae	P	1179																			
Terebellidae sp. (partial/damaged)	P	1179							1		1				1						
Lanice conchilega	P	1195											1								
Polycirrus sp. (partial/damaged)	P	1235	1	24					2		1	3					1				
Polycirrus sp. A	P	1235		12																	
Thelepus setosus	P	1255	1								2	5			2		1				

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
SABELLIDA	P	1256																			
Sabellidae	P	1257																			
Sabellidae sp. (partial/damaged)	P	1257							6			6	3	2		4				2	
Sabellidae sp. (juvenile)	P	1257		11												1					
Jasmineira sp. (partial/damaged)	P	1287									5	4									
Pseudopotamilla reniformis	P	1316							5					2		20					
Serpulidae	P	1324																			
Serpulidae sp. (juvenile)	P	1324						2		11	4										
Serpulidae sp. (partial/damaged)	P	1324	2	1					1							1					
Hydroides norvegica	P	1334											5	1		1					
Pomatoceros sp. (partial/damaged)	P	1339	5						68	15	9	3	30	34		12	10				26
Pomatoceros sp. (juvenile)		1339							16				5	25	18	36	28		4		20
Pomatoceros lamarcki	P	1340	69	1	1				259	104	20	8	123	132	107	82	126	2	1		230
Pomatoceros triqueter	P	1341							1			1		5							10
Spirorbidae	P	1362																			
Circeis spirillum	P	1369															95				4
OLIGOCHAETA	P	1402																			
TUBIFICIDA	P	1403																			
Enchytraeidae	P	1501																			
Enchytraeidae sp. (indet)	P	1501		2	1								1								
CHELICERATA	Q	1																			
PYCNOGONIDA	Q	2																			
Nymphonidae	Q	3																			
Nymphon brevitarse	Q	6															1				
Nymphon grossipes	Q	8																			
Ammotheidae	Q	13																			
Achelia sp. (juvenile)	Q	14																			
CRUSTACEA	R	1																			
MAXILLOPODA	R	13																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
CIRRIPEDIA	R	14																			
THORACICA	R	15																			
Verrucidae	R	39																			
Verruca stroemia	R	41	2						6	23	2	8		2		27		2	2		1
BALANOIDEA	R	59																			
Balanidae	R	73																			
Balanidae sp. (juvenile)	R	73		24	5					17	4	3	1		9	14		24	11		1
Balanidae sp. (partial/damaged)	R	73																			
Balanus balanus	R	76							8	2	17	119		2	4			4			13
Balanus crenatus	R	77		11	51					5		17									
COPEPODA	R	142																			
CYCLOPOIDA	R	617																			
Notodelphyidae	R	678																			
Notodelphyidae sp. (partial/damaged)	R	678										1									
HARPACTICOIDA	R	785																			
Harpacticidae	R	953																			
Zaus goodsiri	R	972		1																	
Peltidiidae	R	1034																			
Alteutha oblonga	R	1038														1					
Thalestridae	R	1061																			
Amenophia pulchella	R	1065		2																	
Thalestris longimana	R	1079																			
POECILOSTOMATOIDA	R	1787																			
Clausidiidae	R	1911																			
Mesnilia sp. (partial/damaged)	R	1938									2										
SIPHONOSTOMATOIDA	R	2061																			
Artotrogidae	R	2097																			
Artotrogus orbicularis	R	2099										1									
Caligidae	R	2206																			
Caligus sp. (indet)	R	2207																		1	
EUMALACOSTRACA	S	23																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
AMPHIPODA	S	97																			
Amphipoda sp. (partial/damaged)	S	97																			
Oedicerotidae	S	118																			
Perioculodes longimanus	S	131																			
Pleustidae	S	143																			
Parapleustes bicuspis	S	146															6				
Urothoidae	S	245																			
Urothoe sp. (partial/damaged)	S	246													1						
Urothoe brevicornis	S	247																			
Urothoe elegans	S	248																			
Iphimediidae	S	377																			
Iphimedia perplexa	S	383											1								
Liljeborgiidae	S	394																			
Liljeborgia pallida	S	397									1										
Ampeliscidae	S	422																			
Ampelisca diadema	S	429											1								
Pontoporeiidae	S	450																			
Bathyporeia sp. (partial/damaged)	S	451																			
Melitidae	S	495																			
Melitidae sp. (partial/damaged)	S	495											2								
Cheirocratus sp. (partial/damaged)	S	503								1			3	2							1
Cheirocratus sundevalli	S	506												2							
Othomaera othonis	S	519											2								
Isaeidae	S	537																			
Gammaropsis sp. (partial/damaged)	S	537									1			4							
Gammaropsis nitida	S	542								1											
Ischyroceridae	S	558																			
Ericthonius sp. (juvenile)	S	561							2								4				

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Ericthonius punctatus	S	564							4						2		3				
Jassa sp. (partial/damaged)	S	568															1				
Jassa herdmani	S																				
Aoridae	S	577																			
Aoridae sp. (partial/damaged)	S	577							1							1					
Leptocheirus sp. (partial/damaged)	S	586		1						1	2										
Leptocheirus hirsutimanus	S	588							1	2											
Corophiidae	S	604																			
Corophiidae sp. (partial/damaged)	S	604																			
Corophiidae sp. (juvenile)	S	604									1										
Monocorophium sextonae	S	615							53		9	2	3	10		14		1			
Unicola crenatipalma	S	621													1						
Caprellidae	S	639																			
Caprella sp. (partial/damaged)	S	640																			
Caprella linearis	S	646	1							1					1		1				
Phtisicidae	S	655																			
Phtisica marina	S	657																			
ISOPODA	S	790																			
Gnathiidae	S	792																			
Gnathia sp. (juvenile)	S	793		1										1		1					
Gnathia oxyuraea	S	796												1							
Anthuridae	S	801																			
Anthura gracilis	S	803							24					13	1	1	2				8
Cirolanidae	S	841																			
Eurydice pulchra	S	854																			
Eurydice spinigera	S	855																			
Sphaeromatidae	S	857																			
Cymodoce truncata	S	863								2		5									
Janiridae	S	883																			
Janira maculosa	S	892								2	2										

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
TANAIDACEA	S	1099																			
Anarthruidae	S	1115																			
Pseudoparatanais batei	S	1140														1					
CUMACEA	S	1183																			
Bodotriidae	S	1184																			
Bodotria scorpioides	S	1197															1				
Leuconiidae	S	1204																			
Eudorellopsis deformis	S	1210																			
DECAPODA	S	1276																			
Caridea	S	1293																			
Caridea sp. (partial/damaged)	S	1293											2								
Hippolytidae	S	1334																			
Eualus sp. (partial/damaged)	S	1342									1										
Eualus pusiolus	S	1345								1			1		1						
PAGUROIDEA	S	1436																			
Paguridae	S	1445																			
Paguridae sp. (partial/damaged)	S	1445									1		1				3				
Paguridae sp. (juvenile)	S	1445											2	1							2
Anapagurus hyndmanni	S	1448									2	1		1			1				
Pagurus sp. (partial/damaged)	S	1454								2											
Galatheidae	S	1469																			
Galathea sp. (juvenile)	S	1470											1								
Galathea sp. (partial/damaged)	S	1470															1				
Porcellanidae	S	1480																			
Pisidia longicornis	S	1482	2						6	1	6	2	15	25							1
BRACHYURA	S	1485																			
Majidae	S	1512																			
Hyas coarctatus	S	1519										2				1	3				
BRACHYRHYNCHA	S	1567																			
Goneplacidae	S	1603																			
Pilumnus hirtellus	S	1615																			
Pinnotheridae	S	1634																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Nepinnotheres pinnotheres	S	1637							2												
MOLLUSCA	W	1																			
POLYPLACOPHORA	W	46																			
NEOLORICATA	W	47																			
Leptochitonidae	W	48																			
Leptochiton sp. (partial/damaged)	W	51							2	1	1	1		7							
Leptochiton sp. (juvenile)	W	51												1							
Leptochiton asellus	W	53							1	2	1	1	27	9		2	3				2
Leptochiton cancellatus	W	54							2		2						1				
Acanthochitonidae	W	83																			
Acanthochitona sp. (juvenile)	W	86									1										
Acanthochitona crinita	W	86											1								
GASTROPODA	W	88																			
Gastropoda sp. (partial/damaged)	W	88																			
ARCHAEOGASTROPODA	W	90																			
Turbinidae	W	129																			
Tricolia pullus	W																				
Trochidae	W	140																			
Gibbula sp. (juvenile)	W	157		1									2	3							
Gibbula sp. (partial/damaged)	W	157								2		1									
Gibbula cineraria	W	163								4	2	2			2	3					
Gibbula tumida	W	161							2	1			10	2	1						
Calliostoma sp. (juvenile)	W	180										1									
Calliostoma zizyphinum	W	182									1			1	2						
PATELLOGASTROPODA	W	219																			
Lottiidae	W	221																			
Tectura virginea	W	224							1												
MESOGASTROPODA	W	256																			
Littorinidae	W	283																			
Lacuna crassior	W	287										3									

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Rissoidae	W	324																			
Onoba semicostata	W	371								1				5			1				
Naticidae	W	482																			
Euspira pulchella	W	491																			
Lunatia catena	W	493																			
NEOGASTROPODA	W	670																			
Muricidae	W	672																			
Ocenebra erinacea	W	685																			
Buccinidae	W	702																			
Buccinum undatum	W	708			1					2											1
Nassarius sp. (partial/damaged)	W	743																			
Nassarius reticulatus	W	745																			
Nassarius incrassatus	W	747																			
HETEROSTROPHA	W	878																			
Pyramidellidae	W	906																			
Odostomia sp. (juvenile)	W	908	1								1				1						1
Odostomia sp. (partial/damaged)	W	908							2	3						1	1				
Odostomia sp. (indet)	W	908											1								
Odostomia unidentata	W	916																			
Ondina diaphana	W	959												1							
Ondina divisa	W	960											1								
OPISTHOBRANCHIA	W																				
Opisthobranchia sp. (partial/damaged)	W											1									
CEPHALASPIDEA	W	1002																			
Cylichnidae	W	1024																			
Cylichna cylindracea	W	1028														1					
Retusidae	W	1073																			
Retusa truncatula	W	1080																			
NUDIBRANCHIA	W	1243																			
Dotidae	W	1269																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Doto pinnatifida	W	1287													1						
Goniodorididae sp.	W	1299																			
Goniodoris nodosa	W	1302													1						
Okenia sp. (partial/damaged)	W	1307													1						
PELECYPODA	W	1560																			
Bivalvia sp. (partial/damaged)	W	1560							3	3							3				
Bivalvia sp. (juvenile)	W	1560											11								
NUCULOIDA	W	1561																			
Nuculidae	W	1563																			
Nucula sp. (juvenile)	W	1565									6		1	11			1				
Nucula nucleus	W	1570									5			4							
MYTILOIDA	W	1689																			
Mytilidae	W	1691																			
Mytilidae sp. (juvenile)	W	1691	5	9					11	1		2	12	15	5	2	11	1			3
Mytilidae sp. (partial/damaged)	W	1691																			
Modiolus sp. (partial/damaged)	W	1698							2												
Gibbomodiola adriaticus	W	1700											1								
Musculus subpictus	W											2									2
Musculus discors	W	1721							6		1	5	3		12	1					
OSTREOIDA	W	1752																			
Anomiidae	W	1805																			
Anomiidae sp. (juvenile)	W	1805	1	3					8	7	2	13		1	3	9	3		1		
Anomiidae sp. (partial/damaged)	W	1805									1										
Monia patelliformis	W	1814							1		1										
Monia squama	W													2							
VENEROIDA	W	1815																			
Montacutidae	W	1888																			
Tellimya ferruginosa	W	1902																			
Kurtiella bidentata	W	1906									1			4							
Astartidae	W	1921																			
Goodallia triangularis	W	1929																		13	

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Cardiidae	W	1938																			
Cardiidae sp. (partial/damaged)	W	1938									1										
Mactridae	W	1967																			
Spisula sp. (juvenile)	W	1974		56	5									2	12						
Spisula sp. (partial/damaged)	W	1974										1									
Spisula elliptica	W	1975													3						
Spisula solida	W	1977		2																	
Spisula subtruncata	W	1978		2	3								1								
Lutraria angustior	W	1983											1								
Tellinidae	W	2008																			
Tellinidae sp. (partial/damaged)	W	2008								1											
Psammobiidae	W	2042																			
Gari tellinella	W	2049		2									5		1						
Semelidae	W	2057																			
Semelidae sp. (partial/damaged)	W	2057										1									
Abra sp. (juvenile)	W	2058																			
Abra alba	W	2059									1										
Veneridae	W	2086																			
Veneridae sp. (juvenile)	W	2086											3	4		1					
Veneridae sp. (partial/damaged)	W	2086																			
Clausinella fasciata	W	2100		1																	
Timoclea ovata	W	2104		2						2		2	39	12	1					1	
MYOIDA	W	2140																			
Myidae	W	2142																			
Mya sp. (juvenile)	W	2144							2					12			3				
Mya arenaria	W	2149												4							
Corbulidae	W	2153																			
Hiatella sp. (juvenile)	W	2165										3									
Hiatella sp. (partial/damaged)	W	2165							12			18		6		3	2				
Hiatella arctica	W	2166	4	3					49	17	15	64	2	23	19	59	8	3			3

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Hiatella rugosa	W												2	1		56					
PHOLADOMYOIDA	W	2220																			
Thraciidae	W	2226																			
Thracia sp. (juvenile)	W	2228			1								1	1	1						
BRYOZOA	Y	1																			
STENOLAEMATA	Y	2																			
CYCLOSTOMATIDA	y	3																			
Cyclostomatida sp. (indet)	Y	3									3										
Crisiidae	Y	4																			
Crisiidae sp. (partial/damaged)	Y	4																			
Crisia sp.	Y	13																			
Crisia eburnea	Y	17										+					+				
Bicellariella ciliata	Y											+									
Tubuliporidae	Y	26																			
Tubulipora sp. (indet)	Y	27															+				
Lichenoporidae	Y	61																			
Lichenoporidae sp. (indet)	Y	61						+					+	+							+
Disporellla hispida	Y	66																			
GYMNOLAEMATA		69																			
CTENOSTOMATIDA	y	70																			
Alcyonidiidae	Y	72																			
Alcyonidium diaphanum	Y	76		+	+								+		+				+		
Alcyonidium cf mytili	Y	80																			
CHEILOSTOMATIDA	Y	149																			
Scruparіidae	Y	159																			
Scruparia sp. (partial/damaged)	Y	160																			
Eucrateidae	Y	163																			
Eucratea loricata	Y	165															+				
Electridae	Y	174																			
Electra pilosa	Y	178										+		+	+		+		+		
Flustridae	Y	185																			
Flustra foliacea	Y	187		+	+								+			+					

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Calloporidae	Y	200																			
Membraniporella nitida	Y	234										+									
Bugulidae	Y	239																			
Bugula flabellata	Y	243										+									
Candidae	Y	265																			
Scrupocellaria scruposa	Y	279													+						
Escharellidae	Y	361																			
Escharella sp. (partial/damaged)	Y	362									+										
Escharella immersa	Y	364						+													
Escharella ventricosa	Y	369																	+		
Celleporidae	Y	493																			
Turbicellepora avicularis	Y	504									+	+			+						+
PHORONIDA	ZA	1																			
Phoronidae	ZA	2																			
Phoronis sp. (indet)	ZA	3													1						
ECHINODERMATA	ZB	1																			
CRINOIDEA	ZB	2																			
COMATULIDA	ZB	7																			
Antedonidae	ZB	8																			
Antedon sp. (partial/damaged)	ZB	9																			
Antedon bifida	ZB	10																			1
ASTEROIDEA	ZB	18																			
FORCIPULATIDA	ZB	95																			
Asteriidae	ZB	96																			
Asterias rubens	ZB	100														1					1
OPHIUROIDEA	ZB	105																			
OPHIURIDA	ZB	121																			
Ophiotrichidae	ZB	122																			
Ophiothrix fragilis	ZB	124									10	1									
Ophiocomidae	ZB	126																			
Ophiocomina nigra	ZB	128									1										
Amphiuridae	ZB	148																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Amphiuridae sp. (juvenile)	ZB	148		2									1								
Amphipholis squamata	ZB	161		3						1	1	1	34	21	3	1	2				4
ECHINOIDEA	ZB	181																			
ECHINOIDA	ZB	190																			
Parechinidae	ZB	191																			
Psammechinus miliaris	ZB	193							2					2		1	1				1
SPATANGOIDA	ZB	213																			
Loveniidae	ZB	221																			
Echinocardium cordatum	ZB	223																			
HOLOTHURIOIDEA	ZB	229																			
APODIDA	ZB	289																			
Synaptidae	ZB	290																			
Leptosynapta sp. (partial/damaged)	ZB	291		1																	
Leptosynapta minuta	ZB	297																		1	
CHORDATA																					
TUNICATA	ZD	1																			
Tunicata sp. (indet.)	ZD	1								1											
ASCIDIACEA	ZD	2																			
ENTEROGONA	ZD	3																			
APLOUSOBRANCHIATA	ZD	4																			
Polyclinidae	ZD	20																			
Polyclinidae sp. (partial/damaged)	ZD	20										1									
Didemnidae	ZD	41																			
Didemnum maculosum	ZD	54		+					+			+			+	+					
PHLEBOBRANCHIATA	ZD	67																			
Ascidiidae	ZD	82																			
Ascidiidae sp. (juvennile)	ZD	82												1							
Ascidiella sp. (partial/damaged)	ZD	83										1									
Ascidiella aspersa	ZD	84									1										
Ascidiella aspersa	ZD	98																			

Station			Cod - 1	Cod - 2	Cod - 3	Cod - 4	Cod - 5	Cod - 6	Cod - 7	Cod - 8	Cod - 9	Cod - 10	Cod - 11	Cod - 12	Cod - 13	Cod - 14	Cod - 15	Cod - 16	Cod - 17	Cod - 18	Cod - 19
Styelidae	ZD	100																			
Styelidae sp. (juvenile)	ZD	100	2						4	4	9	14			1	1					
Styelidae sp. (partial/damaged)	ZD	100															2				
Polycarpa pomaria	ZD	115										5									
Dendrodoa grossularia	ZD	120											109	53		18					2
Pyuridae	ZD	131																			
Molgulidae	ZD	145																			
Molgulidae sp. (juvenile)	ZD	145		2							2		2		1		5				
Molgula sp. (juvenile)	ZD	146										5									
Molgula occulta	ZD	152										3									
PISCES																					
OSTEICHTHYES	ZG	1																			
PERCIFORMES	ZG	302																			
Ammodytidae	ZG	441																			
Ammodytes tobianus	ZG	444			1																

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
PORIFERA	C	1																			
CALCAREA	C	2																			
LEUCOSOLENIDA	C	49																			
Leucosoleniidae	C	50																			
Leucosolenia sp. (indet)	C	53																			
Sycettidae	C	126																			
Sycon ciliatum	C	133																			
DESMOSPONGIAE	C	152																			
HADROMERIDA	C	317																			
Polymastiidae	C	350																			
Clionidae	C	471																			
Cliona celata	C	480										+									
CNIDARIA	D	1																			
HYDROZOA	D	58																			
CONICA	D	296																			
Sertulariidae	D	407																			
Sertulariidae sp. (partial/damaged)	D	407			+		+			+		+	+								
Abietinaria abietina	D	409											+								
Hydrallmania falcata	D	424								+											
Sertularia sp. (partial/damaged)	D	433																			
Plumulariidae	D	447																			
Kirchenpaueria pinnata	D	455																			
PROBOSCOIDA	D	488																			
Campanularidae	D	491																			
Campanularidae sp. (partial/damaged)	D	491											+								
Clytia hemisphaerica	D	503																			
Obelia geniculata	D	520																			
ANTHOZOA	D	583																			
OCTOCORALLIA	D	584																			

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
ALCYONACEA	D	594																			
Alcyoniidae	D	596																			
Alcyonium digitatum	D	597	+						+					+							
HEXACORALLIA	D	627																			
ACTINIARIA	D	662																			
Actiniaria sp. (juvenile)	D	662	1						3	1	1	2		1							
Actiniaria sp. (indet)	D	662																			
PLATYHELMINTHES	F	1																			
TURBELLARIA	F	2																			
Turbellaria sp. (indet)	F	2								1											
NEMATODA	HD	1																			
Nematoda sp. (indet)	HD	1	5	54	37	3	7	12	3	4	4	3	15		1	11	2				
NEMERTEA	G	1																			
Nemertea sp. (indet)	G	1						1													
SIPUNCULA	N	1																			
SIPUNCULIDEA	N	2																			
GOLFINGIIFORMES	N	10																			
Golfingiidae	N	11																			
Golfingiidae sp. (juvenile)	N	11			1			17			2				2						
Golfingiidae sp. (partial/damaged)	N	11	8																		
Golfingia (Golfinia) elongata	N	14	1																		
Phascolionidae	N	29																			
Phascolion (Phascolion) strombus strombus	N	34				1															
ANNELIDA	P	1																			
POLYCHAETA	P	2																			
PHYLLODOCIDA	P	3																			
Pisionidae	P	13																			
Pisione sp. (partial/damaged)	P	14																			
Pisione remota	P	15																			
Polynoidae	P	25																			

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
Polynoidae sp. (partial/damaged)	P	25						4			1		3								
Polynoidae sp. (juvenile)	P	25				1															
Subadyte pellucida	P	32							2					2							
Harmothoe sp. (partial/damaged)	P	50						5	2		2										
Lepidonotus sp. (partial/damaged)	P	80																			
Lepidonotus squamatus	P	83							2				1		1						
Polynoe scolopendrina	P	84																			
Pholoidae	P	90																			
Pholoe sp. (partial/damaged)	P	91					1														
Pholoe inornata	P	92		2			1	3	2		1	15	1	2	4						
Sigalionidae	P	96																			
Sigalionidae sp. (partial/damaged)	P	96																		1	1
Phyllodocidae	P	114																			
Phyllodocidae sp. (partial/damaged)	P	114		2	2		1	6			1	5	2		3						
Phyllodocidae sp. (juvenile)	P	114						2													
Eteone longa/flava aggregate	P	118														1					
Hesionura elongata	P	122																			
Eulalia sp. (partial/damaged)	P	150										3									
Eulalia sp. (juvenile)	P	150		1																	
Eulalia aurea	P	151						5													
Eulalia bilineata	P	152										2									
Eulalia ornata	P	156						7							3						
Eumida sp. (partial/damaged)	P	163										1									
Eumida sp. (juvenile)	P	163																			
Eumida sanguinea complex	P	167											4								
Phyllodoce sp. (partial/damaged)	P	178																			

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
Glyceridae	P	254																			
Glycera sp. (partial/damaged)	P	255				2	1														
Glycera sp. (juvenile)	P	255																			
Glycera lapidum	P	260		1																	
Glycera oxycephala	P	262														1			1		
Hesionidae	P	293																			
Hesionidae sp. (partial/damaged)	P	293								1											
Psamthe fusca	P	305																			
Nereimyra punctata	P	311										1									
Syllidae	P	346																			
Syllidae sp. (partial/damaged)	P	346																			
Syllis sp. D (after Garwood)	P	358																			
Syllis sp. E (after Garwood)	P	358			1	3					1										
Syllis sp. H (after Garwood)	P	358			1		2														
Syllis sp. (partial/damaged)	P	358	1			2	1				1										
Syllis armillaris	P	365			2	1	2	17				1			1						
Syllis variegata	P	371						4													
Eusyllinae sp. (partial/damaged)	P	373																			
Amblyosyllis formosa	P	375																			
Eusyllis blomstrandi	P	380																			
Streptosyllis bidentata	P	403																			
Syllides japonicus	P																				
Exogoninae	P	410																			
Exogoninae sp. (partial/damaged)	P	410																			
Brania pusilla	P	414																			
Sphaerosyllis bulbosa	P	425				1	1														
Erinaceusyllis erinaceus	P	426																			
Prosphaerosyllis tetralix	P	431																			
Autolytinae sp. (partial/damaged)	P	433					1					1	2								

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
Myrianida sp. (partial/damaged)	P	434								1	3	1	1								
Myrianida sp. (juvenile)	P	434																			
Epigamia alexandri	P	435																			
Myrianida brachycephala	P	437										2									
Myrianida langerhansi	P	440											1								
Nereididae	P	458																			
Nereididae sp. (juvenile)	P	458											1								
Nereididae sp. (partial/damaged)	P	458																			
Nereis pelagica	P	476																			
Nephtyidae	P	490																			
Nephtyidae sp. (juvenile)	P	490			1																
Aglaophamus sp. (partial/damaged)	P	491																			
Aglaophamus agilis	P	493																	1		
Nephtys sp. (partial/damaged)	P	494																			5
Nephtys sp. (juvenile)	P	494																			
Nephtys cirrosa	P	498														1	3			1	
EUNICIDA	P	536																			
Eunicidae	P	553																			
Nematonereis unicornis	P	568						1													
Lumbrineridae	P	569																			
Lumbrineridae sp. (partial/damaged)	P	569													1						
Lumbrineris sp. (juvenile)	P	572																			
Lumbrineris near cingulata	P														1						
Dorvilleidae	P	598																			
Ophryotrocha sp. (partial/damaged)	P	613																			
Protodorvillea kefersteini	P	638																			
Schistomeringos neglecta	P	642				2															
ORBINIIDA	P	654																			

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Orbiniidae	P	655																			
Scoloplos armiger	P	672															1			2	1
Paraonidae	P	674																			
Paradoneis lyra	P	699																			
SPIONIDA	P	707																			
Spionidae	P	720																			
Spionidae sp. (partial/damaged)	P	720		3				1	1	1		3		1		1	1			4	
Aonides oxycephala	P	722		2																	
Laonice sp. (partial/damaged)	P	731																			
Polydora sp. (partial/damaged)	P	748																			
Dipolydora sp. (partial/damaged)	P		9				5	124			3			2	9						
Dipolydora caulleryi	P	751	5	3	4	1	1	2			3		3		7						
Dipolydora coeca	P	750	8	5			1	22			3		2	3	2						
Dipolydora flava	P	754										1									
Pseudopolydora sp. (partial/damaged)	P	771			1																
Pseudopolydora pulchra	P	774																			
Pygospio elegans	P	776																			
Spiophanes bombyx	P	794														1					
Cirratulidae	P	822																			
Cirratulidae sp. (partial/damaged)	P	822												1							
Cirratulus sp. (partial/damaged)	P							8													
Dodecaceria sp. (partial/damaged)	P	840					1														
CAPITELLIDA	P	902																			
Capitellidae	P	903																			
Capitellidae sp. (partial/damaged)	P	903																	1		
Capitella sp. (indet)	P	906						2													
Mediomastus fragilis	P	919						1													

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Notomastus latericeus	P	921				2															
Maldanidae	P	938																			
Maldanidae sp. (partial/damaged)	P	938																			
Lumbriclymene minor	P	942																			
Euclymeninae sp. (partial/damaged)	P	951																			
OPHELIIDA	P	992																			
Opheliidae	P	993																			
Ophelia sp. (juvenile)	P	997														1					
Ophelia borealis	P	999																1			2
Scalibregmatidae	P	1020																			
Ascleroceilus intermedius	P	1022																			
Scalibregma celticum	P	1026																			
POLYGORDIIDA	P	1060																			
Polygordiidae	P	1061																			
Polygordius sp. (partial/damaged)	P	1062																			
PROTODRILIDA	P	1067																			
Saccocirridae	P	1085																			
Saccocirrus papillocercos	P	1088																			
TEREBELLIDA	P	1099																			
Sabellariidae	P	1112																			
Sabellaria alveolata	P	1116			1																
Sabellaria spinulosa	P	1117	1	1	2			23							1						
Terebellidae	P	1179																			
Terebellidae sp. (partial/damaged)	P	1179																			
Lanice conchilega	P	1195																			
Polycirrus sp. (partial/damaged)	P	1235		1	1																
Polycirrus sp. A	P	1235																			
Thelepus setosus	P	1255																			

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SABELLIDA	P	1256																			
Sabellidae	P	1257																			
Sabellidae sp. (partial/damaged)	P	1257		1	1			1						1							
Sabellidae sp. (juvenile)	P	1257																			
Jasmineira sp. (partial/damaged)	P	1287																			
Pseudopotamilla reniformis	P	1316	1					2													
Serpulidae	P	1324																			
Serpulidae sp. (juvenile)	P	1324			1			1				3									
Serpulidae sp. (partial/damaged)	P	1324						2	1					1	1						
Hydroides norvegica	P	1334			2					1											
Pomatoceros sp. (partial/damaged)	P	1339	28	12			8	107		6	21		18	2	68						
Pomatoceros sp. (juvenile)		1339		2	82			23	2		10	30	9								
Pomatoceros lamarcki	P	1340	119	29	9		9	573	1	7	51	38	27	2	285						
Pomatoceros triqueter	P	1341						4			1										
Spirorbidae	P	1362																			
Circeis spirillum	P	1369																			
OLIGOCHAETA	P	1402																			
TUBIFICIDA	P	1403																			
Enchytraeidae	P	1501																			
Enchytraeidae sp. (indet)	P	1501																			
CHELICERATA	Q	1																			
PYCNOGONIDA	Q	2																			
Nymphonidae	Q	3																			
Nymphon brevitarse	Q	6																			
Nymphon grossipes	Q	8													1						
Ammotheidae	Q	13																			
Achelia sp. (juvenile)	Q	14											2								
CRUSTACEA	R	1																			
MAXILLOPODA	R	13																			

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CIRRIPEDIA	R	14																			
THORACICA	R	15																			
Verrucidae	R	39																			
Verruca stroemia	R	41		2	4		6	4	2	1	1	2									
BALANOIDEA	R	59																			
Balanidae	R	73																			
Balanidae sp. (juvenile)	R	73			1							1									
Balanidae sp. (partial/damaged)	R	73		1		1									2						
Balanus balanus	R	76						1							13						
Balanus crenatus	R	77														3					
COPEPODA	R	142																			
CYCLOPOIDA	R	617																			
Notodelphyidae	R	678																			
Notodelphyidae sp. (partial/damaged)	R	678																			
HARPACTICOIDA	R	785																			
Harpacticidae	R	953																			
Zaus goodsiri	R	972																			
Peltidiidae	R	1034																			
Alteutha oblonga	R	1038																			
Thalestridae	R	1061																			
Amenophia pulchella	R	1065																			
Thalestris longimana	R	1079											1								
POECILOSTOMATOIDA	R	1787																			
Clausidiidae	R	1911																			
Mesnilia sp. (partial/damaged)	R	1938																			
SIPHONOSTOMATOIDA	R	2061																			
Artotrogidae	R	2097																			
Artotrogus orbicularis	R	2099																			
Caligidae	R	2206																			
Caligus sp. (indet)	R	2207																			
EUMALACOSTRACA	S	23																			

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AMPHIPODA	S	97																			
Amphipoda sp. (partial/damaged)	S	97					1					1									
Oedicerotidae	S	118																			
Perioculodes longimanus	S	131																		1	
Pleustidae	S	143																			
Parapleustes bicuspis	S	146																			
Urothoidae	S	245																			
Urothoe sp. (partial/damaged)	S	246																			1
Urothoe brevicornis	S	247																			1
Urothoe elegans	S	248						1													
Iphimediidae	S	377																			
Iphimedia perplexa	S	383																			
Liljeborgiidae	S	394																			
Liljeborgia pallida	S	397																			
Ampeliscidae	S	422																			
Ampelisca diadema	S	429																			
Pontoporeiidae	S	450																			
Bathyporeia sp. (partial/damaged)	S	451																		1	
Melitidae	S	495																			
Melitidae sp. (partial/damaged)	S	495													1						
Cheirocratus sp. (partial/damaged)	S	503																			
Cheirocratus intermedius	S	505									1										
Cheirocratus sundevalli	S	506																			
Othomaera othonis	S	519																			
Isaeidae	S	537																			
Gammaropsis sp. (partial/damaged)	S	537																			
Gammaropsis nitida	S	542																			
Ischyroceridae	S	558																			

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Ericthonius sp. (juvenile)	S	561																			
Ericthonius punctatus	S	564																			
Jassa sp. (partial/damaged)	S	568								1											
Jassa herdmani	S									54											
Aoridae	S	577																			
Aoridae sp. (partial/damaged)	S	577																			
Leptocheirus sp. (partial/damaged)	S	586																			
Leptocheirus hirsutimanus	S	588																			
Corophiidae	S	604																			
Corophiidae sp. (partial/damaged)	S	604						1			1	1									
Corophiidae sp. (juvenile)	S	604																			
Monocorophium sextonae	S	615		10				21			8	6			3						
Unicola crenatipalma	S	621																			
Caprellidae	S	639																			
Caprella sp. (partial/damaged)	S	640											2								
Caprella linearis	S	646								6											
Phtisicidae	S	655																			
Phtisica marina	S	657								2											
ISOPODA	S	790																			
Gnathiidae	S	792																			
Gnathia sp. (juvenile)	S	793																			
Gnathia oxyuraea	S	796																			
Anthuridae	S	801																			
Anthura gracilis	S	803	3	1				1							1						
Cirolanidae	S	841																			
Eurydice pulchra	S	854				3	1														
Eurydice spinigera	S	855																4	4		
Sphaeromatidae	S	857																			
Cymodoce truncata	S	863									1				1						
Janiridae	S	883																			

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Janira maculosa	S	892	1																		
TANAIDACEA	S	1099																			
Anarthruidae	S	1115																			
Pseudoparatanais batei	S	1140																			
CUMACEA	S	1183																			
Bodotriidae	S	1184																			
Bodotria scorpioides	S	1197																			
Leuconiidae	S	1204																			
Eudorellopsis deformis	S	1210																			1
DECAPODA	S	1276																			
Caridea	S	1293																			
Caridea sp. (partial/damaged)	S	1293																			
Hippolytidae	S	1334																			
Eualus sp. (partial/damaged)	S	1342																			
Eualus pusiolus	S	1345																			
PAGUROIDEA	S	1436																			
Paguridae	S	1445																			
Paguridae sp. (partial/damaged)	S	1445													2						
Paguridae sp. (juvenile)	S	1445																			
Anapagurus hyndmanni	S	1448																			
Pagurus sp. (partial/damaged)	S	1454																			
Galatheidae	S	1469																			
Galathea sp. (juvenile)	S	1470																			
Galathea sp. (partial/damaged)	S	1470																			
Porcellanidae	S	1480																			
Pisidia longicornis	S	1482		1				7	2	8	5	58	7		15						
BRACHYURA	S	1485																			
Majidae	S	1512																			
Hyas coarctatus	S	1519																			
BRACHYRHYNCHA	S	1567																			
Goneplacidae	S	1603																			
Pilumnus hirtellus	S	1615												1							

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Pinnotheridae	S	1634																			
Nepinnotheres pinnotheres	S	1637												1							
MOLLUSCA	W	1																			
POLYPLACOPHORA	W	46																			
NEOLORICATA	W	47																			
Leptochitonidae	W	48																			
Leptochiton sp. (partial/damaged)	W	51			1				1		1										
Leptochiton sp. (juvenile)	W	51																			
Leptochiton asellus	W	53										2			1						
Leptochiton cancellatus	W	54																			
Acanthochitonidae	W	83																			
Acanthochitona sp. (juvenile)	W	86																			
Acanthochitona crinita	W	86																			
GASTROPODA	W	88																			
Gastropoda sp. (partial/damaged)	W	88			1					2					7						
ARCHAEOGASTROPODA	W	90																			
Turbinidae	W	129																			
Tricolia pullus	W									1											
Trochidae	W	140																			
Gibbula sp. (juvenile)	W	157						1		1											
Gibbula sp. (partial/damaged)	W	157													2						
Gibbula cineraria	W	163										2									
Gibbula tumida	W	161									2				2						
Calliostoma sp. (juvenile)	W	180																			
Calliostoma zizyphinum	W	182																			
PATELLOGASTROPODA	W	219																			
Lottiidae	W	221																			
Tectura virginea	W	224																			
MESOGASTROPODA	W	256																			
Littorinidae	W	283																			

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Lacuna crassior	W	287																			
Rissoidae	W	324																			
Onoba semicostata	W	371	4						2	34		5									
Naticidae	W	482																			
Euspira pulchella	W	491				1															
Lunatia catena	W	493																			1
NEOGASTROPODA	W	670																			
Muricidae	W	672																			
Ocenebra erinacea	W	685						1													
Buccinidae	W	702																			
Buccinum undatum	W	708										1									
Nassarius sp. (partial/damaged)	W	743										1									
Nassarius reticulatus	W	745										1									
Nassarius incrassatus	W	747													1						
HETEROSTROPHA	W	878																			
Pyramidellidae	W	906																			
Odostomia sp. (juvenile)	W	908	2		1																
Odostomia sp. (partial/damaged)	W	908													4						
Odostomia sp. (indet)	W	908																			
Odostomia unidentata	W	916													3						
Ondina diaphana	W	959																			
Ondina divisa	W	960																			
OPISTHOBRANCHIA	W																				
Opisthobranchia sp. (partial/damaged)	W																				
CEPHALASPIDEA	W	1002																			
Cylichnidae	W	1024																			
Cylichna cylindracea	W	1028																			
Retusidae	W	1073																			
Retusa truncatula	W	1080								1											
NUDIBRANCHIA	W	1243																			

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Dotidae	W	1269																			
Doto pinnatifida	W	1287								1											
Goniodorididae sp.	W	1299																			
Goniodoris nodosa	W	1302																			
Okenia sp. (partial/damaged)	W	1307																			
PELECYPODA	W	1560																			
Bivalvia sp. (partial/damaged)	W	1560		3		1		1													
Bivalvia sp. (juvenile)	W	1560																			
NUCULOIDA	W	1561																			
Nuculidae	W	1563																			
Nucula sp. (juvenile)	W	1565	1												3						
Nucula nucleus	W	1570										1			5						
MYTILOIDA	W	1689																			
Mytilidae	W	1691																			
Mytilidae sp. (juvenile)	W	1691		4	6		1			44	1		9								
Mytilidae sp. (partial/damaged)	W	1691												1	1						
Modiolus sp. (partial/damaged)	W	1698												1							
Gibbomodiola adriaticus	W	1700																			
Musculus subpictus	W																				
Musculus discors	W	1721																			
OSTREOIDA	W	1752																			
Anomiidae	W	1805																			
Anomiidae sp. (juvenile)	W	1805	1		1		1		1	2	2	1	1								
Anomiidae sp. (partial/damaged)	W	1805		1											13						
Monia patelliformis	W	1814													1						
Monia squama	W									1											
VENEROIDA	W	1815																			
Montacutidae	W	1888																			
Tellimya ferruginosa	W	1902																			4
Kurtiella bidentata	W	1906													2						
Astartidae	W	1921																			

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Goodallia triangularis	W	1929				12	3														
Cardiidae	W	1938																			
Cardiidae sp. (partial/damaged)	W	1938																			
Mactridae	W	1967																			
Spisula sp. (juvenile)	W	1974					5												2		
Spisula sp. (partial/damaged)	W	1974				6															
Spisula elliptica	W	1975																			
Spisula solida	W	1977																			
Spisula subtruncata	W	1978				4	1	1									1			2	
Lutraria angustior	W	1983																			
Tellinidae	W	2008																			
Tellinidae sp. (partial/damaged)	W	2008																			
Psammobiidae	W	2042																			
Gari tellinella	W	2049																			
Semelidae	W	2057																			
Semelidae sp. (partial/damaged)	W	2057																			
Abra sp. (juvenile)	W	2058																		3	
Abra alba	W	2059													1						
Veneridae	W	2086																			
Veneridae sp. (juvenile)	W	2086				4	2				1				2						
Veneridae sp. (partial/damaged)	W	2086													3						
Clausinella fasciata	W	2100									1										
Timoclea ovata	W	2104				3	3														
MYOIDA	W	2140																			
Myidae	W	2142																			
Mya sp. (juvenile)	W	2144		8			1	6							5						
Mya arenaria	W	2149																			
Corbulidae	W	2153																			
Hiatella sp. (juvenile)	W	2165									3										
Hiatella sp. (partial/damaged)	W	2165	3		2			12	1		1				2						

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Hiatella arctica	W	2166	3	13	2		6	35	6		5	1			9						
Hiatella rugosa	W																				
PHOLADOMYOIDA	W	2220																			
Thraciidae	W	2226																			
Thracia sp. (juvenile)	W	2228																			
BRYOZOA	Y	1																			
STENOLAEMATA	Y	2																			
CYCLOSTOMATIDA	y	3																			
Cyclostomatida sp. (indet)	Y	3																			
Crisiidae	Y	4																			
Crisiidae sp. (partial/damaged)	Y	4								+											
Crisia sp.	Y	13																			
Crisia eburnea	Y	17																			
Bicellariella ciliata	Y									+											
Tubuliporidae	Y	26																			
Tubulipora sp. (indet)	Y	27																			
Lichenoporidae	Y	61																			
Lichenoporidae sp. (indet)	Y	61	+								+	+		+							
Disporellla hispida	Y	66								+											
GYMNOLAEMATA		69																			
CTENOSTOMATIDA	y	70																			
Alcyonidiidae	Y	72																			
Alcyonidium diaphanum	Y	76		+	+	+		+													
Alcyonidium cf mytili	Y	80											+								
CHEILOSTOMATIDA	Y	149																			
Scruparidae	Y	159																			
Scruparia sp. (partial/damaged)	Y	160								+											
Eucrateidae	Y	163																			
Eucratea loricata	Y	165																			
Electridae	Y	174																			
Electra pilosa	Y	178					+			+		+	+								
Flustridae	Y	185																			

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Flustra foliacea	Y	187																			
Calloporidae	Y	200																			
Membraniporella nitida	Y	234																			
Bugulidae	Y	239																			
Bugula flabellata	Y	243																			
Candidae	Y	265																			
Scrupocellaria scruposa	Y	279																			
Escharellidae	Y	361																			
Escharella sp. (partial/damaged)	Y	362																			
Escharella immersa	Y	364																			
Escharella ventricosa	Y	369																			
Celleporidae	Y	493																			
Turbicellepora avicularis	Y	504			+																
PHORONIDA	ZA	1																			
Phoronidae	ZA	2																			
Phoronis sp. (indet)	ZA	3																			
ECHINODERMATA	ZB	1																			
CRINOIDEA	ZB	2																			
COMATULIDA	ZB	7																			
Antedonidae	ZB	8																			
Antedon sp. (partial/damaged)	ZB	9													3						
Antedon bifida	ZB	10																			
ASTEROIDEA	ZB	18																			
FORCIPULATIDA	ZB	95																			
Asteriidae	ZB	96																			
Asterias rubens	ZB	100																			
OPHIUROIDEA	ZB	105																			
OPHIURIDA	ZB	121																			
Ophiotrichidae	ZB	122																			
Ophiothrix fragilis	ZB	124	3						22					56							
Ophiocomidae	ZB	126																			
Ophiocomina nigra	ZB	128	1						2												

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
Amphiuridae	ZB	148																			
Amphiuridae sp. (juvenile)	ZB	148											1								
Amphipholis squamata	ZB	161								10		6	1	1							
ECHINOIDEA	ZB	181																			
ECHINOIDA	ZB	190																			
Parechinidae	ZB	191																			
Psammechinus miliaris	ZB	193					1					5			2						
SPATANGOIDA	ZB	213																			
Loveniidae	ZB	221																			
Echinocardium cordatum	ZB	223																			3
HOLOTHURIOIDEA	ZB	229																			
APODIDA	ZB	289																			
Synaptidae	ZB	290																			
Leptosynapta sp. (partial/damaged)	ZB	291																			
Leptosynapta minuta	ZB	297																			
CHORDATA																					
TUNICATA	ZD	1																			
Tunicata sp. (indet.)	ZD	1																			
ASCIDIACEA	ZD	2																			
ENTEROGONA	ZD	3																			
APLOUSOBRANCHIATA	ZD	4																			
Polyclinidae	ZD	20																			
Polyclinidae sp. (partial/damaged)	ZD	20																			
Didemnidae	ZD	41																			
Didemnum maculosum	ZD	54		+	+										+						
PHLEBOBRANCHIATA	ZD	67																			
Ascidiidae	ZD	82																			
Ascidiidae sp. (juvennile)	ZD	82																			
Ascidiella sp. (partial/damaged)	ZD	83																			
Ascidiella aspersa	ZD	84																			

Station			Cod - 20	Cod - 21	Cod - 22	Cod - 23	Cod - 24a	Cod - 24b	Cod - 25	Cod - 26	Cod - 29	Cod - 31	Cod - 32	Cod - 33	Cod - 34	Cod - 35	Cod - 36	Cod - 37	Cod - 38	Cod - 39	Cod - 40
Ascidiella aspersa	ZD	98																			
Styelidae	ZD	100																			
Styelidae sp. (juvenile)	ZD	100					6	2	1												
Styelidae sp. (partial/damaged)	ZD	100						4													
Polycarpa pomaria	ZD	115																			
Dendrodoa grossularia	ZD	120			16										4						
Pyuridae	ZD	131																			
Molgulidae	ZD	145																			
Molgulidae sp. (juvenile)	ZD	145																			
Molgula sp. (juvenile)	ZD	146		3	1																
Molgula occulta	ZD	152		3							1										
PISCES																					
OSTEICHTHYES	ZG	1																			
PERCIFORMES	ZG	302																			
Ammodytidae	ZG	441																			
Ammodytes tobianus	ZG	444																11	2	6	