Centre for Marine and Coastal Studies Ltd

Beatrice Offshore Wind Farm

Cable Route Benthic Technical Report

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Cover Image: Demonstrator Offshore Turbines at Beatrice Wind Farm site, taken during cable route survey, June 2011.

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1. Executive Summary

The site of the proposed Beatrice Offshore Wind Farm (BOWF) is the Smith Bank within the Moray Firth, Scotland. The proposed cable route corridor for the main exporter cable runs approximately due south from the proposed turbine array to link the wind farm site to the Moray coastline at Spey Bay.

Centre for Marine & Coastal Studies Ltd (CMACS) has been instructed by Beatrice Offshore Wind Farm Ltd (BOWL) to investigate the benthic habitats and communities along this proposed cable route corridor to:

1. identify the presence of any Annex I habitats or priority marine features;
2. characterise the local benthic ecology to support an environmental impact assessment.

This report presents the results of an investigative benthic survey which was conducted in June 2011. The information provided within this report will be used to inform the Environmental Impact Assessment (EIA) of the BOWF development upon the receptor marine environment.

The survey used an underwater camera to collect imagery from 48 out of 50 planned sites and a benthic Day grab to collect sediments for physical analysis from 17 out of a planned 20 of these sites. A sub-set of five of these sediment sites were also sampled for contaminants testing. The survey methodology and the site positions were consulted on and agreed with the relevant statutory authorities[1] prior to survey start. The survey was completed in June 2011 using the vessel 'MV Solstice' operating from Lossiemouth Harbour, Moray on a port return daily basis.

Results from the survey revealed that the majority of the seabed was dominated by fine-medium sands, often with varying amounts of shell fragments or whole shell. Hard substratum such as cobble, gravel and occasional small boulders were found at more inshore locations and muddier sediments were present across the centre of the survey zone within the deeper areas to the south of Smith Bank.

Sediments from the five contaminant sites were investigated for a suite of possible heavy metal and organic contaminants due to the history of oil and gas explorations and production activities in the general area. Organic contaminants (Polycylic Aromatic Hydrocarbons (PAHs), n-alkanes, and total alkanes) were present at very low levels at two of the sites and were not detected at the other three. These two sites were both located in the deepest part of the survey area where the sediments were fine mud and silt. Heavy metals were not present at levels exceeding sediment quality guidelines at any of the sites.

Analysis of the camera imagery revealed four main habitat types: fine rippled sand; encrusted cobble, pebbles and gravel; fine-medium sand with shell fragments; and, burrowed mud. The latter two were the most commonly encountered across the survey area. Habitat types were banded across the survey area in a way that was closely associated with water depth. Fine rippled sand was only recorded from one site located furthest inshore and interspersed the harder substratum habitat of cobbles, pebbles and gravels with encrusting epifauna ascribed to the biotope SS.SCS.CCS.Pomb (*Pomatoceros triqueter* with barnacles, coralline algae and

[1] Consultees were Marine Scotland, Scottish Natural Heritage and Crown Estates.

bryozoan crusts on unstable circalittoral cobbles and pebbles). This biotope may equate to potential Annex 1 rocky reef habitat according to the definitions provided by Irving *et al*. (2009). Offshore from this patch of cobble was medium sand with some shell fragments and very little visible fauna. This habitat was also found at the northern end of the cable route as the seabed rises up to the Smith Bank.

In the deepest areas, in the central part of the survey zone, was a 'burrowed mud' habitat which, although having little visible epifauna, did show evidence of bioturbation, depressions, burrows and tracks. Seapens were also visible at two of the sites present within this area. This habitat is identified as being likely to be the biotope SS. SMu.CFiMu.SpnMeg seapens and burrowing megafauna in circalittoral mud, although density of sea pens was low. This biotope is listed on the 'Priority Marine Features in Scottish territorial waters' list provided by Scottish Natural Heritage (SNH). Marine features on this list include 53 species and habitats which are considered as being important in Scottish waters.

No other indications of potential Annex 1 habitats were found.

The results of the geophysical survey, once received, will be used to investigate the spatial distribution of these habitats and will also allow further investigation for evidence of any further Priority Marine Features or potential Annex I habitats to provide a complete baseline for the assessment.

2. Introduction

The proposed Beatrice Offshore Wind Farm (BOWF) is an area of approximately 131.5km^2 located on the Smith Bank within the Moray Firth, Scotland. The site is approximately 13.5km offshore in a water depth range of 35 - 50m with a tidal range of 2.8 - 3.2m and maximum tidal current speed of 0.26ms^{-1}. The proposed wind farm will consist of approximately 184 offshore turbines producing a nominal capacity of 920MW.

The proposed cable route corridor for the main exporter cable will link the BOWF site to the Moray coastline at Spey Bay as shown in Figure 1.

Centre for Marine & Coastal Studies Ltd (CMACS) was instructed by Beatrice Offshore Wind Farm Ltd (BOWL) to investigate benthic habitats and communities along the proposed cable route corridor to identify the presence of any Annex I habitats or Priority Marine Features. Over the last two years, Scottish Natural Heritage (SNH) has reviewed a large number of marine habitats and species to identify those considered to be of greatest marine nature conservation importance in Scottish territorial waters. They have produced a list of 53 of the most important species and habitats and these are classed as Priority Marine Features.

This report provides the results of this benthic investigative survey which was conducted in June 2011. These results will be used to inform the Environmental Impact Assessment (EIA) of the BOWF proposed development upon the receptor marine habitats and communities.

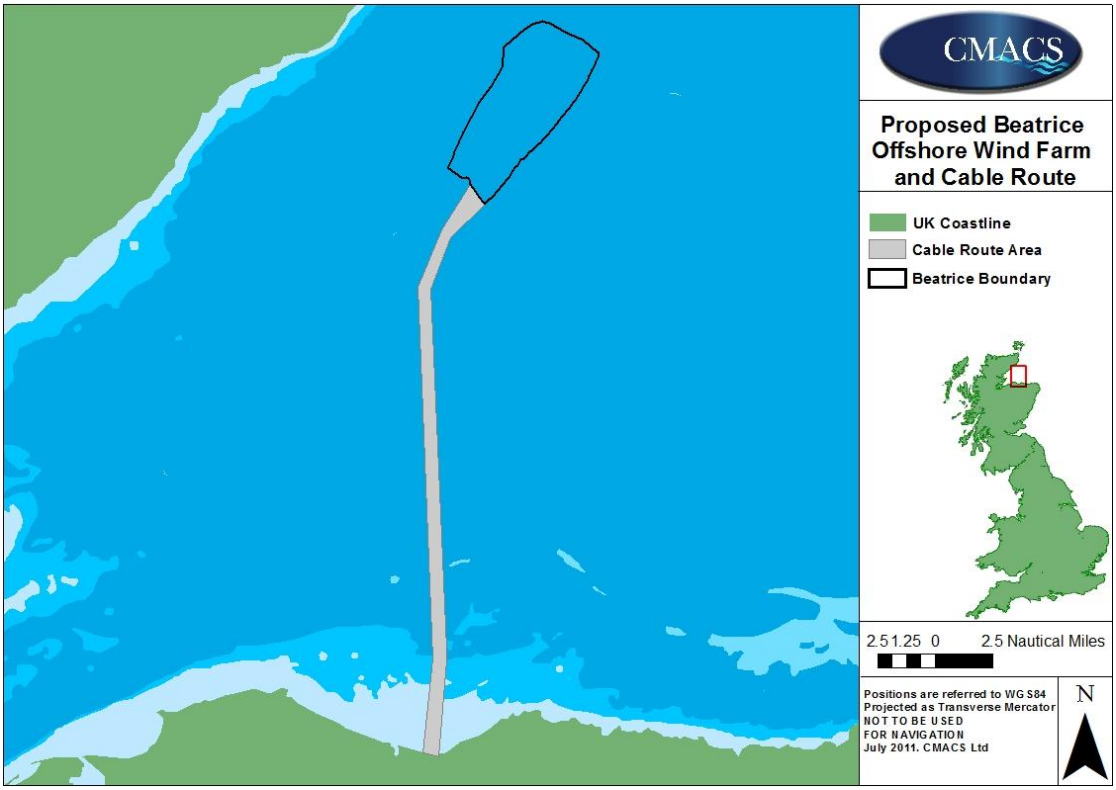


Figure 1: Beatrice Offshore Wind Farm Main Site and Cable Route Corridor

3. Survey and Analysis Methodology

3.1 Overview

As preferred by Marine Scotland, a camera rather than a grab & trawl survey was proposed to survey the cable route corridor and the surrounding area. Reasoning for this was to allow an increased spatial intensity of the seabed survey (in the absence of the geophysical data (due August 2011)) and to investigate potentially sensitive seabed features in a non-intrusive manner. In addition, sediment sampling was also proposed to both inform the coastal processes assessment and to test for any sediment contamination due to the history of oil and gas explorations and production activities within the Moray Firth.

As the geophysical data are currently unavailable for the cable route corridor the rationale for site selection was based upon providing an even coverage of the main cable route corridor with additional near and far-field sites across the area to provide context as well as information on areas where potential remote effects such as sediment deposition will need to be considered during EIA. Where possible, these sites were placed upon differing sediment types using British Geological Survey (BGS) maps to inform the selection; however, BGS maps are generally informed by spatially extensive sampling points and are indicative only at local scales. Fifty sites were identified for investigation and the locations of these sites are displayed in Figure 2. Of these fifty sites, sediment samples were planned to be taken from twenty using a 0.1m^2 Day grab and five of these twenty sediment samples were to be further sampled to provide material for sediment contaminant testing (see Figure 3 for the sediment sample site locations).

Site location and the proposed methodologies for this survey were consulted on with Scottish Natural Heritage (SNH), Marine Scotland (MS) and Crown Estates (CE). Once methodologies had been agreed a ‘Notice to Mariners’ was released to relevant stakeholders and a marine licence (to permit collection of material from the seabed) was obtained from the Marine Management Organisation (MMO).

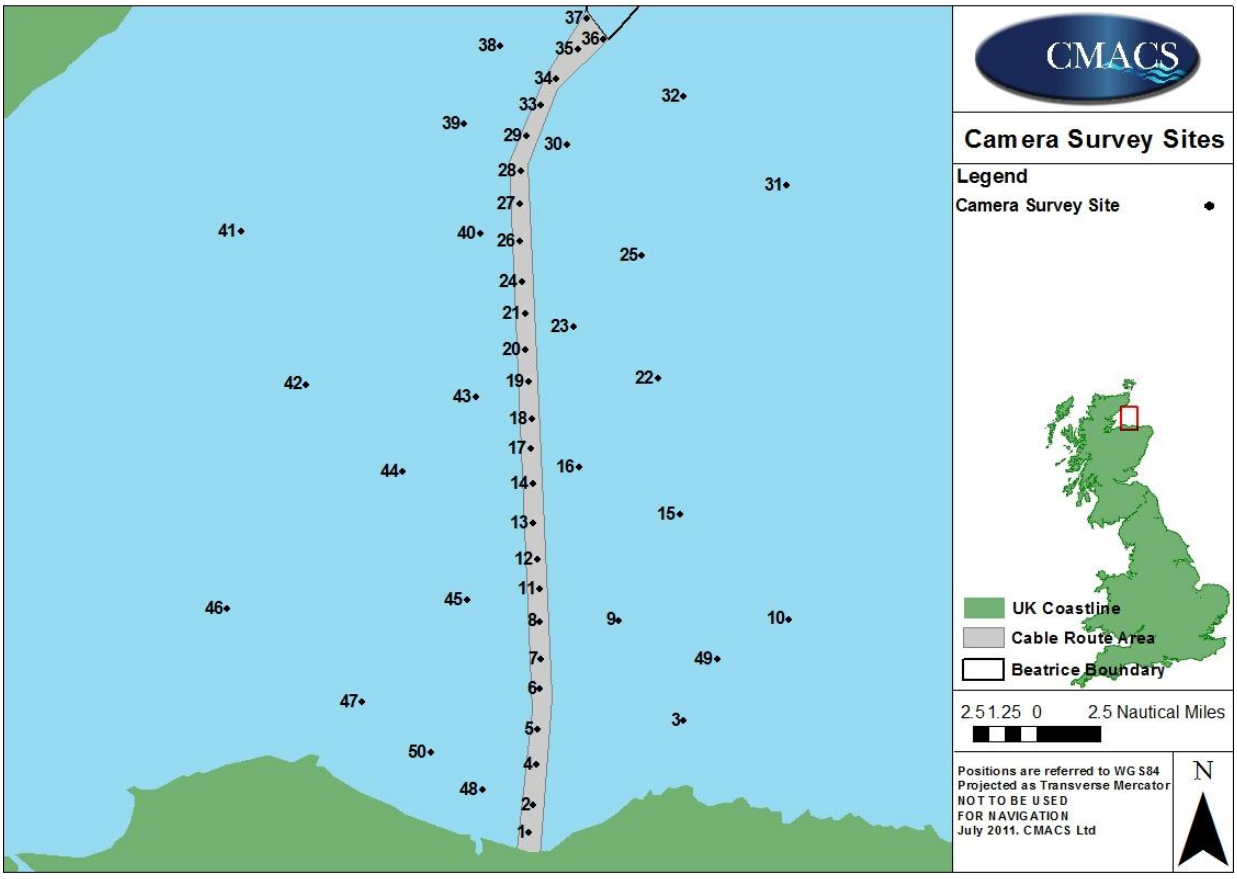


Figure 2: Survey site locations

3.1.1 Underwater Camera Survey

The camera survey was undertaken between 6th-12th June 2011 from the vessel 'MV Solstice' operating on a daily basis from Lossiemouth Harbour, Moray.

A drop-down underwater camera with freshwater housing suitable for use in high turbidity/low visibility environments was used to capture imagery of the sea bed sediments and any epifauna present.

The camera was deployed whilst the vessel was held over the target. Video imagery was recorded as the camera was lowered to the seabed and three high quality stills images were then captured at each site, with the camera being moved approximately 1-3m between each image (to provide information on small-scale spatial variability). The onboard CMACS marine biologist oversaw the deployment of the equipment by the vessel personnel and monitored the live imagery from the video feed. Stills imagery were captured and logged via an onboard computer and details of obvious fauna, flora and sediment type were noted along with position, depth and time. Particular attention was paid to identifying any potential Annex 1 habitats and Priority Marine Features (both habitats and species).

The following key protocols were adhered to during the collection of data from the camera survey:

- camera was firmly on the seabed and stable before any image was captured;

- on-board marine biologist reviewed all footage live and decided on image capture points;
- samples were uniquely referenced to record sample position and date with additional supporting information such as depth;
- field notes were made at the time of image capture recording information such as visibility, main ground type and visible epifauna (including notes on any sensitive species or habitats present);
- post-survey data processing made use of both still and video data from each site to support the description of visible species, communities and ground conditions.

Field notes and recorded positions from the camera survey are presented in Appendix 1.

3.1.2 Grab Survey

The grab survey was implemented during the same period as the camera survey using the same vessel. A Day Grab was used due its ability to return sea bed sediment samples with the surface sediments remaining relatively undisturbed for sub-sampling for the PSA and contaminant samples.

Sediment sampling protocols (including those for contaminants) were in line with industry best practise guidelines, most notably CEFAS (Boyd *et al*., 2002) and JNCC guidelines (JNCC Marine Monitoring Handbook- Davies *et al*., 2001).

Where stones, shells or other large objects prevented the jaws of the grab from closing properly, samples were retaken. Samples of less than 5 litres were also rejected and the grab redeployed up to two further occasions. If no sample was obtained after three attempts the site was abandoned.

Once on deck, the contents of the grab were photographed and sample contents described (notes were made on sediment character, obvious important fauna present and other notes as appropriate).

At sites where a contaminant sample was also required, the grab was thoroughly washed and redeployed to obtain another sample (refer to Figure 3 for contaminant sample locations). As far as possible, contaminant samples were taken from the top 2cm of sediment in the middle of the sample away from the sides of the grab. Hydrocarbon samples were collected with a clean (acetone washed) stainless steel scoop and stored in clearly labelled sterile amber glass jars. Samples for metals were collected with a plastic scoop and stored in plastic containers. Care was taken to ensure that subsample areas did not overlap. Contaminant samples were frozen immediately onboard and kept frozen until return to the laboratory for analysis.

Field notes and positions for the grab sites are provided within Appendix 2 and photographs of grab samples in Appendix 3.

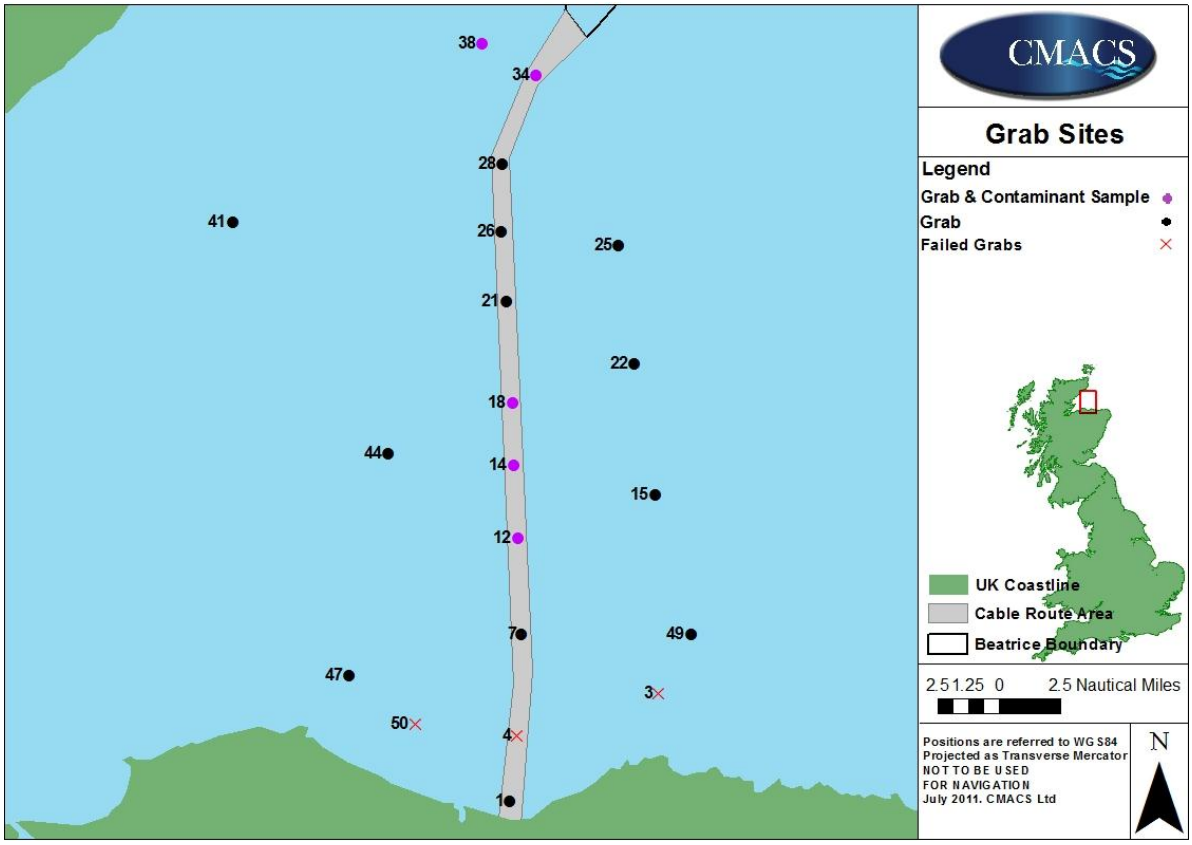


Figure 3: Sediment grab site locations (including contaminant sample sites)

3.2 Variations from planned sampling programme

Some changes of sites from the original planned sampling programme (CMACS J3151 HSE and Method statement May 2011 v1) were incurred during the survey. Deviations and reasoning are provided below in Table 1.

Table 1: **survey site locations altered from the original monitoring method statement**

Site	Reason
3	A grab sample for PSA could not be obtained due to the hard nature of the substratum (cobble, gravel and occasional small boulders- see camera imagery for this site in Section 4.2.2).
4	A grab sample for PSA could not be obtained due to the hard nature of the substratum (cobble- see camera imagery for this site in Section 4.2.2).
50	A grab sample for PSA could not be obtained due to the hard nature of the substratum (cobble- see camera imagery for this site in Section 4.2.2).
10	Camera imagery was not obtained from Site 10 (although the site was visited) due to adverse weather conditions preventing safe deployment of the camera.
31	Camera imagery was not obtained from Site 31 due to adverse weather conditions.

3.3 Analysis Methodology

3.3.1 Physical Sediment Analysis

Particle size analysis (PSA) was carried out using dry sieving, after drying to constant weight at 80 ˚C, on the series of sieves listed in Table 2. Laser size analysis using a Coulter Counter for fine sediments was undertaken on all samples for sediments below the 2mm fraction. This was to provide data to the Coastal Process assessment contractor (ABPmer) with information to inform their assessment.

Table 2: Sieve series used for Particle Size Analysis

Sieve series (mm)											
63	31.5	16	8	4	2.000	1.000	0.500	0.250	0.125	0.063	<0.063

Quality control measures for sediment particle size analyses comprised the use of a laboratory participating in the NMBAQC scheme.

The Total Organic Content (TOC) of the sediments was analysed using sediment residue from the <1mm sieve fraction to avoid undue influence from large sediment particles and the samples were combusted in a furnace at 450˚C using the loss on ignition method.

A number of sediment descriptors were then calculated from the PSA analysis using the Excel based Gradistat v7 programme (Blott and Pye, 2001). Descriptors calculated were: mean Phi size, median particle size, mean particle size and a sorting index (the standard deviation of Phi). These indices were then used to determine the sediment type after the system of Buchanan *et al*. (1984), (see Table 3 and Table 4) and the “Folk triangle” as used by the British Geological Survey (BGS) (Figure 4).

Table 3: Classification used for defining sediment type (based on Wentworth, 1922; from Buchanan, 1984)

Wentworth Scale (mm)	Phi units	Sediment types
>256 mm	<-8	Boulders
64 - 256 mm	-8 to -6	Cobble
4 - 64 mm	-6 to -2	Pebble
2 - 4 mm	-2 to -1	Granule
1 - 2 mm	-1 to -0	Very coarse sand
0.5 - 1 mm	0 - 1	Coarse sand
250 - 500 µm	1 - 2	Medium sand
125 - 250 µm	2 - 3	Fine sand
63 - 125 µm	3 - 4	Very fine sand
<63 µm	>4	Silt

Table 4 Classification used defining degree of sediment sorting (based on Wentworth, 1922; from Buchanan, 1984)

Standard Deviation of mean Phi	Classification
<0.35	Very well sorted
0.35 - 0.5	Well sorted
0.5 - 0.71	Moderately well sorted
0.71 - 1	Moderately sorted
1 - 2	Poorly sorted
2 - 4	Very poorly sorted
>4	Extremely poorly sorted

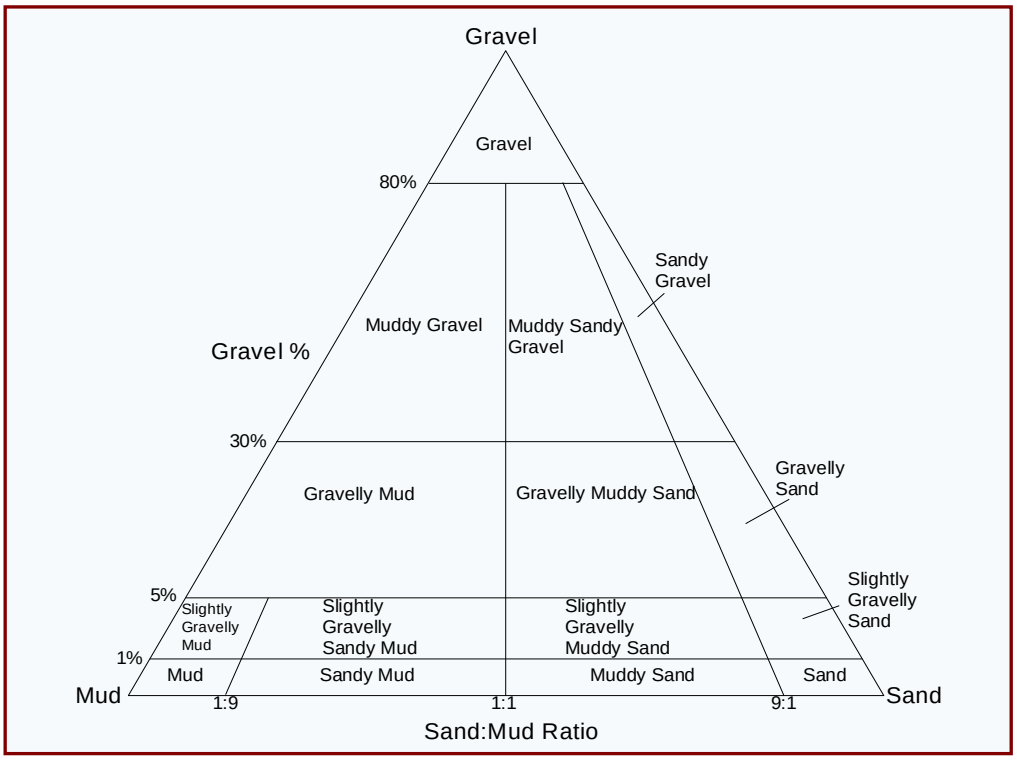


Figure 4: Sediment classifications after Folk (1954), where "gravel" refers to particles greater than 2mm and "mud" to particles less than 63µm; as used by the British Geological Society (BGS).

3.3.2 Chemical Sediment Analysis

The contaminant samples were sent to a UKAS accredited laboratory for analysis for a suite of metals, n-alkanes and polycyclic aromatic hydrocarbons (PAH) testing. This required collection of sub-samples from each contaminant grab sample with storage and analysis requirements as set out in Table 5.

Table 5: Chemical contaminant storage and analysis requirements.

Determinant	Sub-sample size	Storage	Target LoD (ppm)	Accreditation	Technique
Heavy and Trace Metals (except. Hg)	50g	Frozen; clean plastic bags	1.0	NAMAS	HF Extraction & ICPOES
Mercury			0.04	NAMAS	Cold vapour AAS
PAHs & n-alkanes	50g	Frozen; hexane washed glass jars	0.001	NAMAS	GC-MS

LoD = Limit of Detection

3.3.3 Camera Imagery

The post-survey data processing utilised both still and video data recorded from each sampled site to support the description of visible species, communities and ground conditions. A quality control check was performed on the processed images with any features not identified by the analysis team resulting in a re-analysis of the data processed by the individual concerned.

4. Results & Discussion

4.1 Benthic Sediment

4.1.1 Sediment classification

The results from the sediment particle size and TOC analyses are provided in Appendix 4.

The sediment classifications, according to BGS classification (Long, 2006), for each survey site are displayed in Figure 4 and the percentage composition of sand, gravel and mud within the sediments are provided in Figure 6. The sediment parameters of mean phi and TOC are also displayed in Figure 7 and

Figure 8.

Substrata in the north of the survey area predominantly comprised medium sand and gravelly sand with a small cluster of stations to the northeast of the area (Stations 12, 20 and 28) being composed of gravelly sand. The deepest water depths were recorded from the central part of the survey area (92m at site 15). Sites here also had the highest percentage of mud and were classified as being sandy mud (sites 14, 15) or muddy sand (22, 44 and 12). Site 18 had a high percentage of mud but also had some gravel content resulting in a classification of gravelly muddy sand (see Figure 5 and Figure 6).

Sediments in the southern part of the survey area were similar to the north with sand being recorded at the most inshore site and slightly gravelly sand from sites to the immediate north of the cobble area (47, 7 and 49) (see Section 4.2.2 for further information on cobble area). Water depths were shallowest in the southern section of the survey area as the seabed rises to meet the shore.

The inshore sands were either moderately sorted or moderately well sorted as were those at the northern end of the cable route close to the proposed wind farm site. The rest of the sediments were mostly 'poorly sorted' with 'very poorly sorted' recorded from Site 18 (see Appendix 4). Poorly sorted sediments tend to be heterogenous and are typical of low wave and current activity as would be experienced at Site 18, one of the deepest sampled during the survey.

The mean phi diameter of sediments ranged from 1.77-4.91 and is displayed in Figure 7. Muds in the deeper areas recorded the largest phi values (i.e. smallest particle sizes) and the lowest phi values were recorded from sites 47 and 49 where larger particles such as gravel or medium sands were present.

Mean Total Organic Carbon (TOC) as indicated by LOI is below 5% across the survey area (see Figure 8) but highly heterogeneous between stations appearing to trend strongly with percentage mud content. The TOC of sediments ranged from 0.277% at site 47 (located inshore to the west of the cable route) to 3.921% at site 15 located centrally and to the east of the cable route in the muddier sediment area. In general, higher TOC levels were recorded where percentage mud content is highest, in particular at sites in the central of the area. The lowest levels were recorded at sites with coarser sediments on the extreme inshore end of the proposed export cable routes.

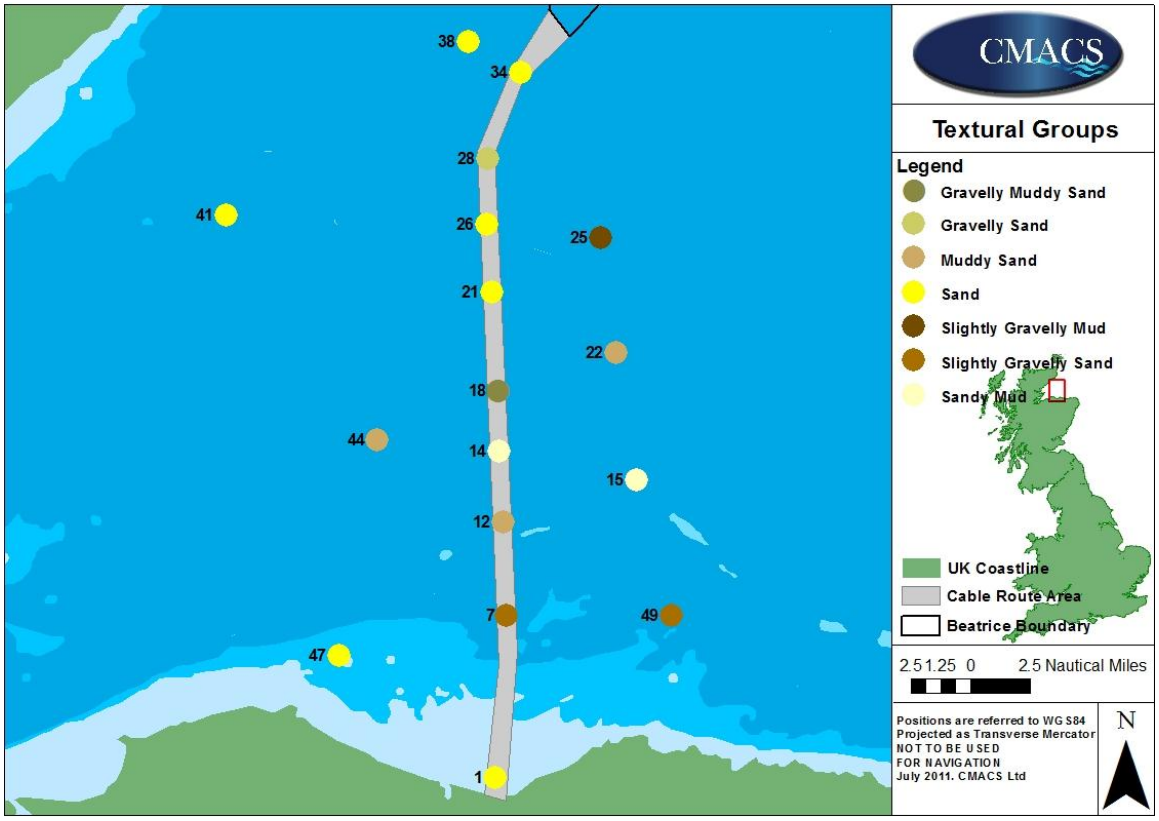


Figure 5: Sediment descriptions after BGS classifications

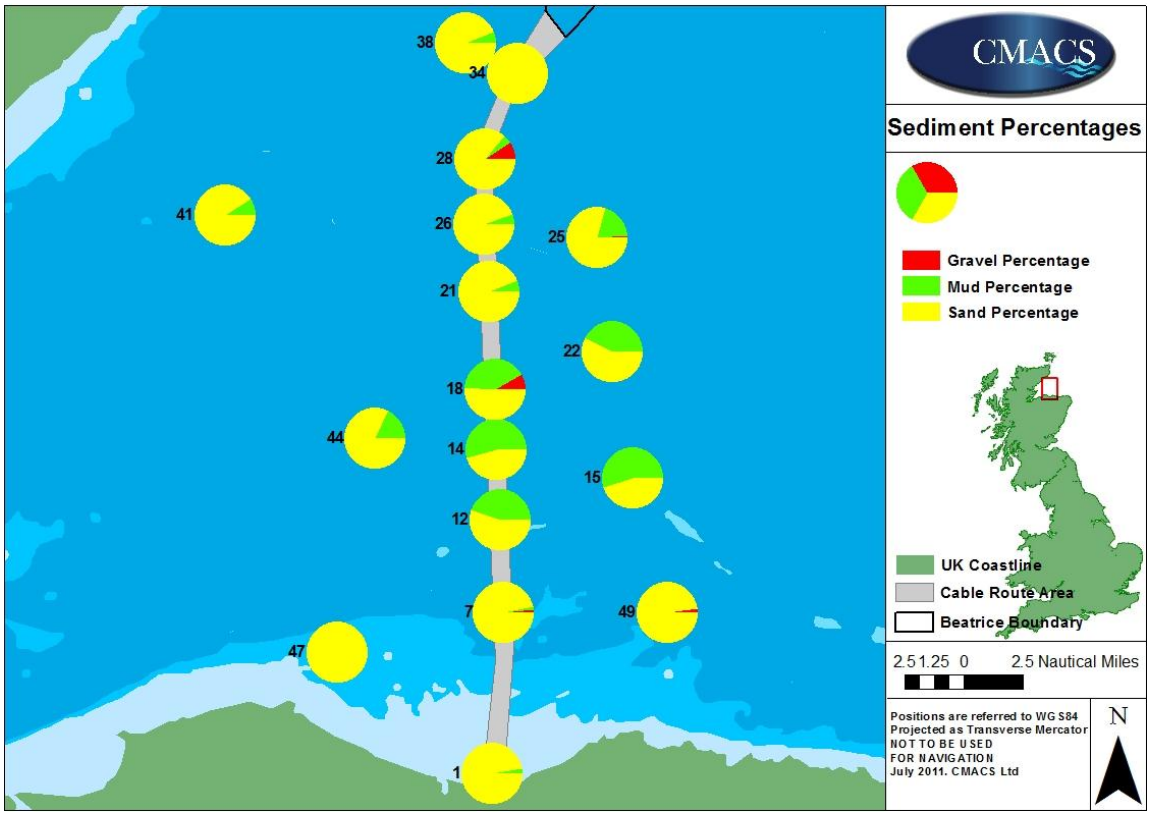


Figure 6: Percentage sediment composition of sand, gravel and mud at each site.

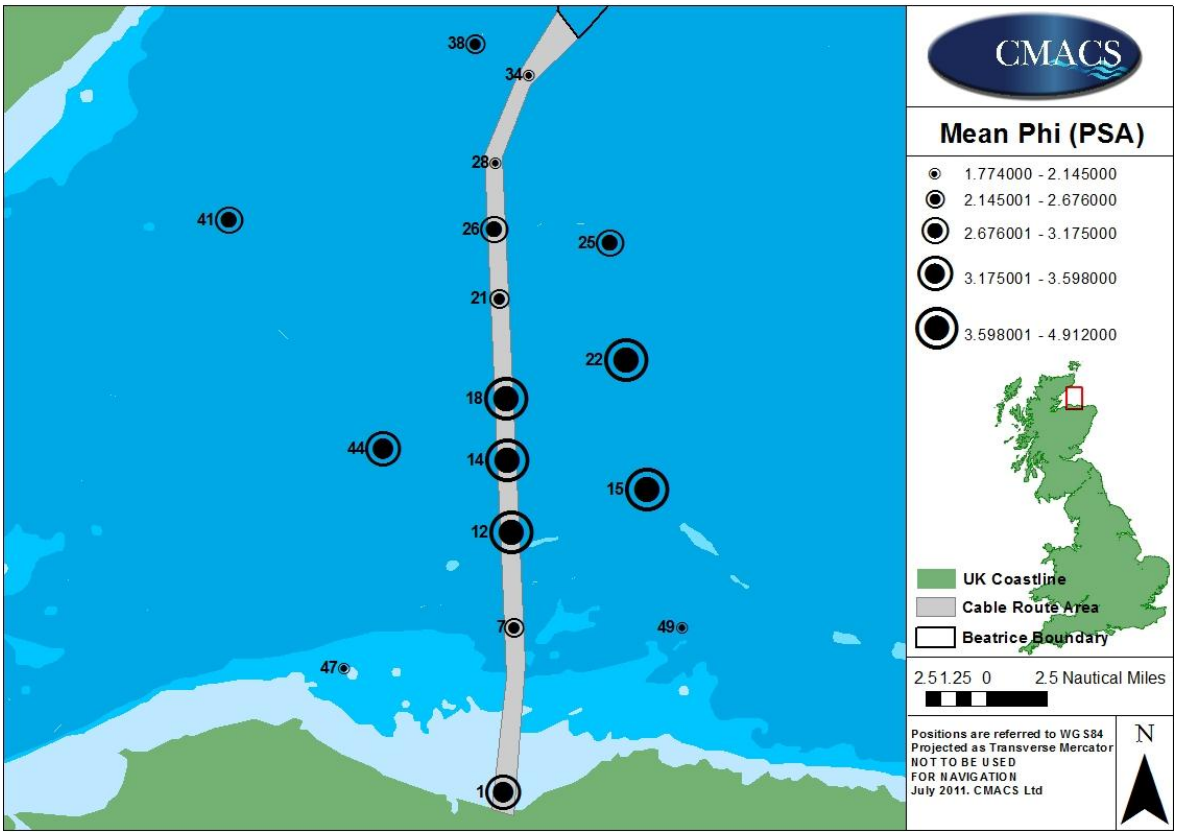


Figure 7: Mean Phi of sediments

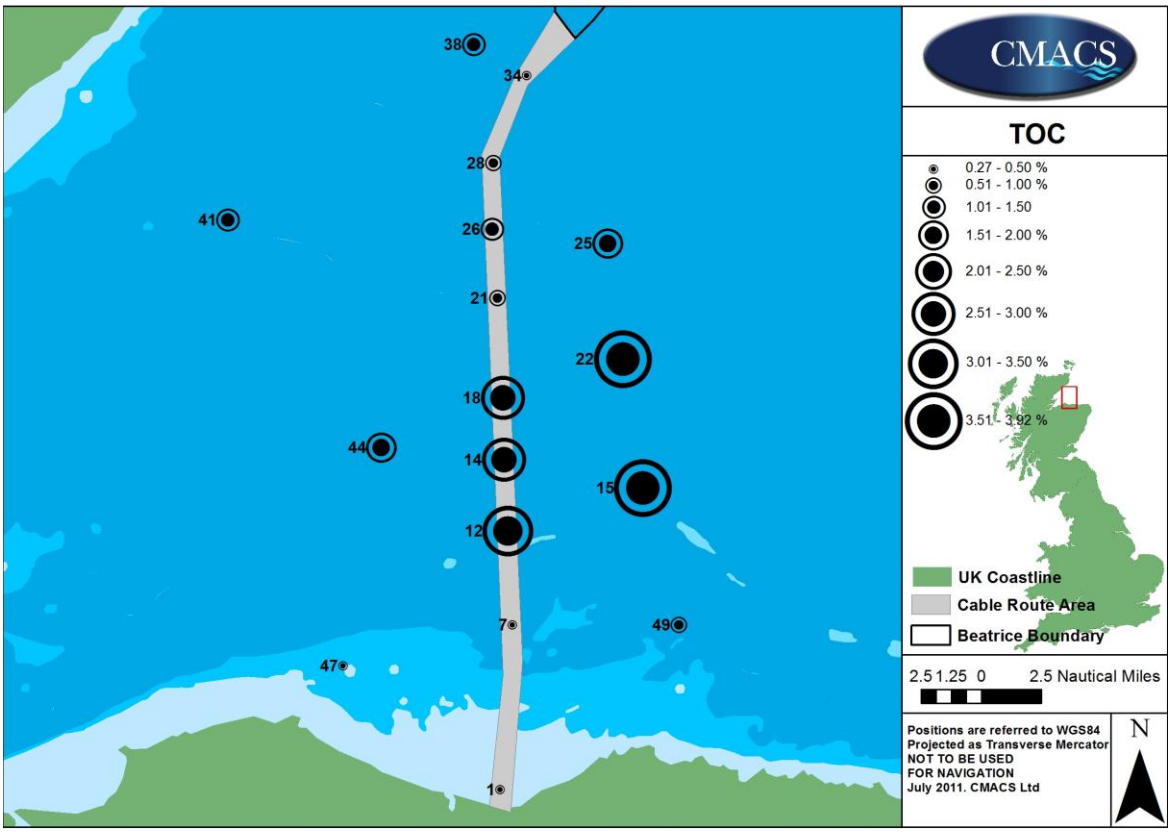


Figure 8: Total Organic Carbon (TOC)

4.1.2 Sediment contaminants

Marine sediment contamination levels have been assessed against the CEFAS and Marine Scotland action levels for the disposal of dredged material (see Table 7) in addition to the ISQG levels as suggested by Canadian Interim Sediment Quality Guidelines (ISQG) (see Table 6).

The Interim Sediment Quality Guideline (ISQG) levels provided by Cole *et al*. (1999) indicate threshold effect levels (TEL) and probable effects levels (PEL). Below the more conservative TEL it is thought that contaminants will have little or no effect on the environment, whilst levels above PEL are expected to show at least some effects on the environment. ISGQ levels are given for some heavy metals that are thought to be particularly harmful to the marine environment.

CEFAS guidelines have two 'action levels', contaminant concentrations below action level one are thought to be of no danger to the environment if disposed of at sea, whilst levels above action level two are considered unsuitable for disposal at sea. Marine Scotland have similar actions levels; though with slightly different values (see Table 7).

ISGQ and potential effecting levels for metals in Table 6 and CEFAS action levels 1 and 2 provided in Table 7.

Table 6: Interim Sediment Quality Guideline levels for metal compounds (mg/kg). TEL= Threshold Effects levels and PEL = Potential Effects levels.

Contaminant	TEL	PEL
Arsenic	7.24	41.6
Cadmium	0.7	4.2
Copper	18.7	108
Lead	30.2	112
Mercury	0.13	0.7
Nickel	n/a	n/a
Zinc	124	271

*values given in µg. g-1 dry weight (= mg/kg) (from Cole, S., Codling, I.D., Parr, W. & Zabel, T. 1999. Guidelines for managing water quality impacts within UK European marine stations. Prepared for the UK Marine SAC Project. Natura 2000). n/a = No Value

Table 7: "Action Levels" from CEFAS disposal of dredging aggregate at sea and from Marine Scotland

	CEFAS		MARINE SCOTLAND	
Contaminant/Compound	Action Level 1	Action Level 2	Action Level 1	Action Level 2
	mg/kg dry Weight (ppm)		mg/kg dry weight (ppm)	
As (Arsenic)	20	100	20	70
Hg (Mercury)	0.3	3	0.25	1.5
Cd (Cadmium)	0.4	5	0.4	4
Cr (Chromium)	40	400	50	370
Cu (Copper)	40	400	30	300
Ni (Nickel)	20	200	30	150
Pb (Lead)	50	500	50	400
Zn (Zinc)	130	800	130	600

	CEFAS		MARINE SCOTLAND	
Contaminant/Compound	Action Level 1	Action Level 2	Action Level 1	Action Level 2
TBT	0.1	1	0.1	0.5
DBT	0.1	1	-	-
MBT	0.1	1	-	-
PCBs, sum of ICES 7	0.01	None	-	-
PCBs, sum of 25 congeners	0.02	0.2	-	-
Dieldrin	0.005	-	-	-
Naphthalene	-	-	-	-
Acenaphthene	-	-	-	-
Acenaphthylene	-	-	-	-
Fluorene	-	-	-	-
Phenanthrene	-	-	-	-
Anthracene	-	-	-	-
Fluoranthene	-	-	-	-
Pyrene	-	-	-	-
Benz[b]fluoranthene	-	-	-	-
Benz[k]fluoranthene	-	-	-	-
Benzo[a]pyrene	-	-	0.1	-
Indeno[1,2,3-cd]pyrene	-	-	0.1	-
Benzo[g,h,i]perylene	-	-	0.1	-
Dibenz[a,h]anthracene	-	-	0.01	-

Full results of chemical analyses are provided in Appendix 5 with relevant parts of the results being reproduced within this section.

Table 8: Results of sediment analysis for metal contamination (mg/kg)

Contaminant	C14	C34	C12	C18	C38
Arsenic	3.5	3.6	3.1	3.4	2.9
Barium	33	13	37	33	24
Cadmium	0.2	<0.1	0.2	0.2	<0.1
Chromium	11	6	10	12	9
Copper	4	4	3	4	2
Lead	5	5	5	5	4
Mercury	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	7	3	6	7	3
Vanadium	12	6	11	12	8
Tin	<1	<1	<1	<1	8

Results of the metal analysis show that all are recorded below the TEL and Action Level 1 levels. Levels of Barium were higher than the other metals (see Table 9) with the highest

level of 37mg/kg at site 12 and the lowest of 13 mg/kg at site 34 towards the main Beatrice site. There are no stated advisory contamination levels for barium. This is a relatively inert metal, widely used in drilling muds to add weight, and can therefore be used as an indicator for possible contamination by drilling activities. Other anthropogenic sources are primarily emissions from refining (as barium is also found as a natural component of fossil fuels) (WHO, 1990). The levels of barium recorded here are well below those which pose potential ecological risk to benthic organisms (Daugherty, 1951).

Most polyaromatic hydrocarbons and PCBs were not detected and those which were detected were at low levels; results for these are presented in (Appendix 5).

Site 18 and Site 14 were the only two sites which did show any detection. These were Phenanthrene (recorded at both sites) and Benzo(g,h,i)perylene, Fluoranthene and Pyrene recorded just from site 18. The levels recorded were all just slightly above the 'Marine Scotland Action level 1' guidelines (highest was 0.3 mg/kg of Fluoranthene detected at site 18). These two sites were both located in the deeper central part of the survey area along the proposed cable corridor route. Both of these sites were located in the deeper mud area of sediments which was also had one of the poorest sorting indexes indicating a low movement of sediments. A low level of mixing due to depth and substratum may explain why contaminant levels were slightly elevated here when compared to the rest of the survey area.

Apart from the above mentioned metal and polycyclic aromatic hydrocarbons, no other contaminants were detected during the sediment contaminant analysis. Overall it can be stated that the sediments have low levels of contamination, well below the low threshold level as determined by ISQG levels, CEFAS action one levels and Marine Scotland action one levels.

4.2 Benthic Habitats

A complete set of photographs and video footage from all stations visited during this survey has been collated electronically. The main habitats and species identified from the camera survey are discussed below. More detailed notes from the image analysis are provided within Appendix 6.

It should be noted that determination of sand size fractions (fine, medium, coarse sand etc.) is not easy from video or stills images and, moreover, the visible sediment surface does not always accurately reflect what is immediately below the surface; for example, there is sometimes a very thin layer of fine shell, sand or silt overlying rather different sediments. For these reasons more reliance should be placed on the results of the PSA analysis when considering sedimentary areas.

Four different sediment types/habitats were identified from the analysis of the camera stills with two habitats dominating the survey area. These four habitats are discussed further below. The spatial distribution of these habitats within the survey area has been plotted in Figure 19 at the end of this section. Usual analysis practice is to ascertain the extent of these habitats by analysing the geophysical data available for the site. This data is will become available in August 2011 and will support the Environmental Impact Assessment.

4.2.1 Fine sand with ripples

This habitat was only recorded inshore at site 1 and only from two of the images. The water depth was relatively shallow (average of 6.5m) and the sediment type was described as being fine sand as medium sand ripples with little epifauna present. An example of this habitat is provided in Figure 9. The scale bar on this and all images shows 1cm intervals,

Figure 9: Inshore sand habitat

4.2.2 Encrusted cobble, pebble and gravel

This habitat was recorded at sites 2, 3, 4, 5, 9, 48 and 50 with a depth range from 6.3 min (site 1) to a maximum of 55m (site 9) with an average depth of 16m. Example images of this habitat are provided in Figure 10 and Figure 11.

At these sites the substratum was dominated by large cobbles with smaller pebbles interspersed with gravel, coarse sand and shell fragments. Small boulders were also recorded from site 9 (see Figure 12). Epifauna recorded were the bryozoan *Flustra folicacea*, encrusting coralline algae, anemone *Metridium senile*, colonial tube building polychaetes, *Pomatoceros sp,* sponges, hydroids and other encrusting bryozoans were also present on the coarser material. *Asterias rubens* was present as well as burrowing anemones and evidence of tube worm burrows and *Lagis koreni* were also present on the sandier parts of the habitat. Faunal diversity was high compared to the rest of the survey area with several different species recorded per image. Brittlestars were also recorded at site 3 see Figure 13.

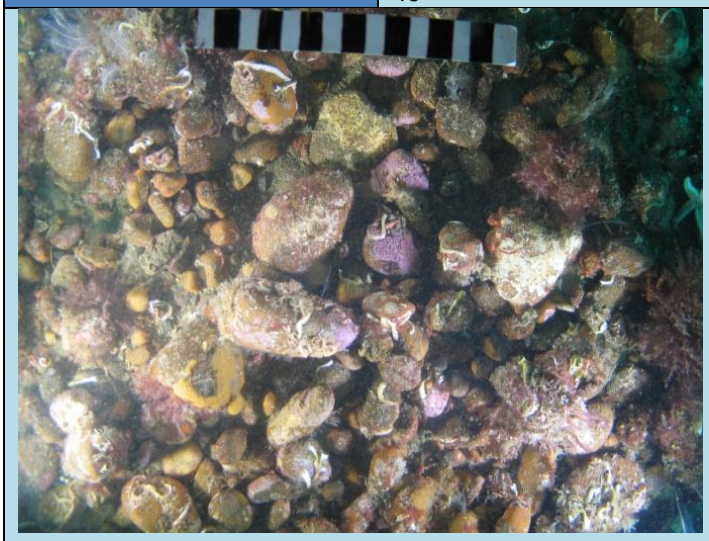
Site	4c	Date	09/06/11
		Time	10:14
		Position	5743.217°N 0301.879°W
		Depth (m)	19.2
		Description	*Pomatoceros triqueter* encrusted cobbles, pebbles and coarse gravel. Squat lobsters, *Munida rugosa* and *Galathea sp.* Hydroid, *Kirchenpaueria pinnata*. Encrusting pink algae, *Lithothamnion sp.* Filamentous red algae. Small patches of *Flustra foliacea.* Indiscernible starfish overturned centre right (likely *A.rubens*).

Figure 10: Encrusted cobble and pebble habitat found at inshore locations

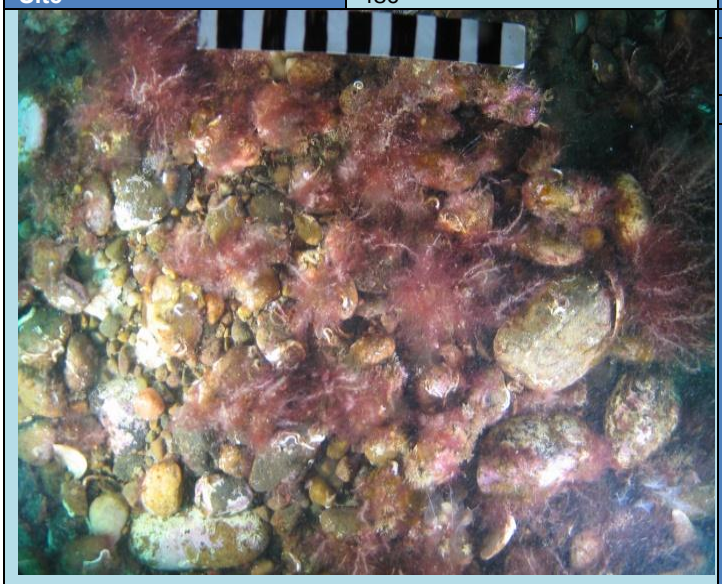
Site	48c	Date	09/06/11
		Time	09:07
		Position	5742.320°N 0305.574°W
		Depth (m)	14.7
		Description	Coarse pebble, gravel and some cobble. Encrusting *Pomatoceros triqueter.* White and pink *Lithothamnion sp.* bryozoa on pebble. White hydroid, *Kirchenpaueria pinnata* and *Flustra foliacea*. Filamentous red algae. White sponge part hidden by scale bar. Aggregation of sea squirts, *Clavelina lepadiformis* below left of scale bar. *Galathea sp.* and *Munida rugosa.*

Figure 11: Encrusted cobble and pebble habitat found at inshore locations

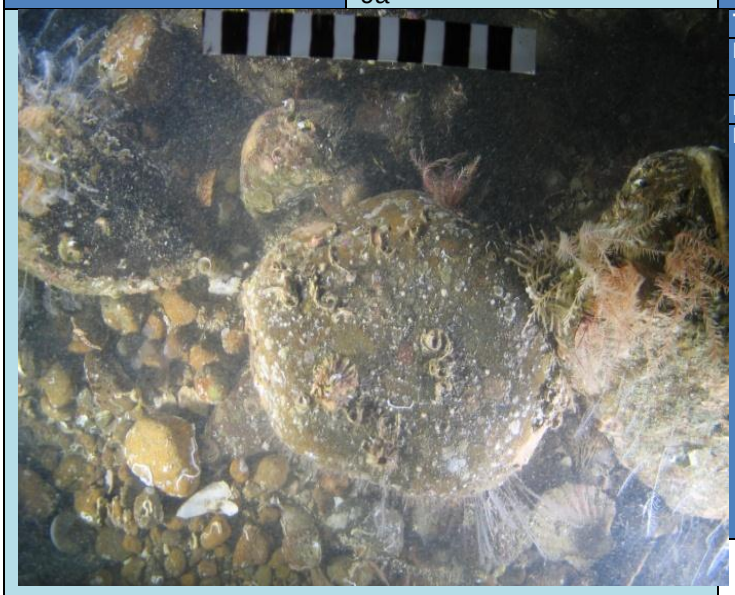
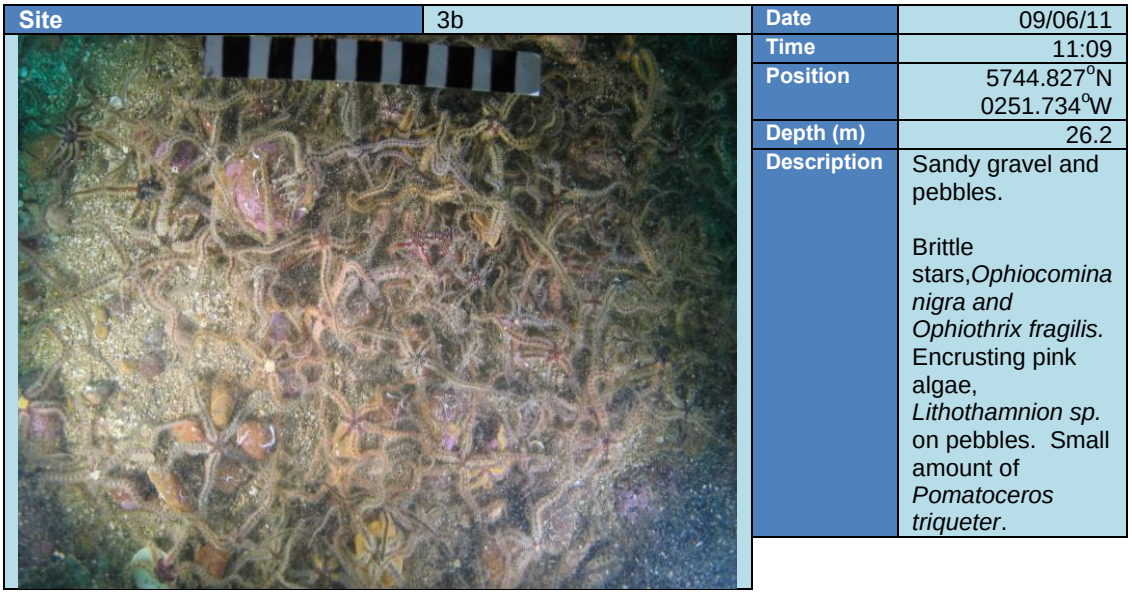
Site	9a	Date	07/06/11
		Time	08:37
		Position	5748.538°N 0256.203°W
		Depth (m)	55.8
		Description	Boulders, cobble and pebble. Some encrusting *Pomatoceros triqueter.* Feather stars, *Antedon bifida*. Hydroid, *Kirchenpaueria pinnata* and other *Plumulariidae sp.* on boulder top left and bottom right. *Scallop sp.* shells amongst substrate. Single large worm tube centre left.

Figure 12: Boulders at site 9.



Site	3b	Date	09/06/11
		Time	11:09
		Position	5744.827°N 0251.734°W
		Depth (m)	26.2
		Description	Sandy gravel and pebbles. Brittle stars,*Ophiocomina nigra and Ophiothrix fragilis.* Encrusting pink algae, *Lithothamnion sp.* on pebbles. Small amount of *Pomatoceros triqueter*.

Figure 13: Brittlestars at site 3

4.2.3 Fine sand with some shell fragments

This was the main habitat type recorded from the survey and was present at sites 6,7,8,47 and 49 offshore from the cobble and pebble habitat described above and also recorded from sites 19-21, 23-30 and 32-40 at the offshore end of the cable route heading up the Smith Bank towards the Beatrice main site. Depth range was 24m at site 47 to a maximum of 56m at Site 19 (although the average depth was 44m for the sites within this habitat range).

The sediment description for this habitat type is fine sand with shell fragments and a silt veneer with either no or very sparse visible epifauna. Small amounts of bivalve and gastropod shell fragments are visible with occasional large dead shells e.g. *Ensis* sp at site 27 (see Figure 14 below). Epifaunal species recorded from these sites were very low in numbers and were; common starfish, *Asterias rubens, Ophiura sp,* and *Pomatoceros triqueter* encrusting empty bivalve shell with very small amounts of hydroids and bryozoa. Occasional sand mason worms, *Lanice conchilega* were also noted.

Site	27c
Date	10/06/11
Time	15:00
Position	5803.810°N 0303.063°W
Depth (m)	46.1
Description	Fine sand and shell with small amount of shell fragments. Empty *Ensis sp.* shells. Hydroid/bryozoa below scale bar and worm casts centre.

Figure 14: Fine sand with broken shell fragments and empty Ensis sp. shells.

Site	29a
Date	11/06/11
Time	11:43
Position	5802.323°N 0302.571°W
Depth (m)	42.4
Description	Very shelly fine sand Small amount of hydroid bottom right.

Figure 15: Sand with shell fragments

4.2.4 Burrowed mud

This habitat was found at sites 11-18, 22 and 41-46. These were the deeper sites to the south of Smith Bank across the middle of the survey zone with a depth range of 51m at site 42 to 94m at site 45.

The sediment for this habitat was very fine sediment; mainly mud with occasional silt overlay, and a high number of mixed sized burrows. Markings and tracks were also visible in the mud indicating the presence of epifauna. These burrows and depressions indicate a high degree of bioturbation and could be indicative of the presence of epifauna such as *Nephrops norvegicus* or burrowing mud-shrimp such as *Callianassa sp*. See Figure 16 and Figure 17 for examples of this habitat.

Visible epifauna was rare (see Figure 18) but sea pens, *Pennatula phosphorea* were recorded from Site 41. Fish were also present at some sites; transparent goby, *Aphia minuta* was recorded at Site 44 and plaice, *Pleuronectes platessa* was recorded at Site 46.

Site	13a

Date	10/06/11
Time	10:42
Position	5752.115°N 0302.126°W
Depth (m)	82.3
Description	Mud Numerous pits and burrows of varying size in sediment.

Figure 16: Burrowed mud at site 13

Site	18a

Date	10/06/11
Time	12:40
Position	5755.940°N 0302.223°W
Depth (m)	81.7
Description	Mud Large, deep burrows middle left likely from megafauna. Other smaller burrows in sediment.

Figure 17: Burrowed mud at Site 18

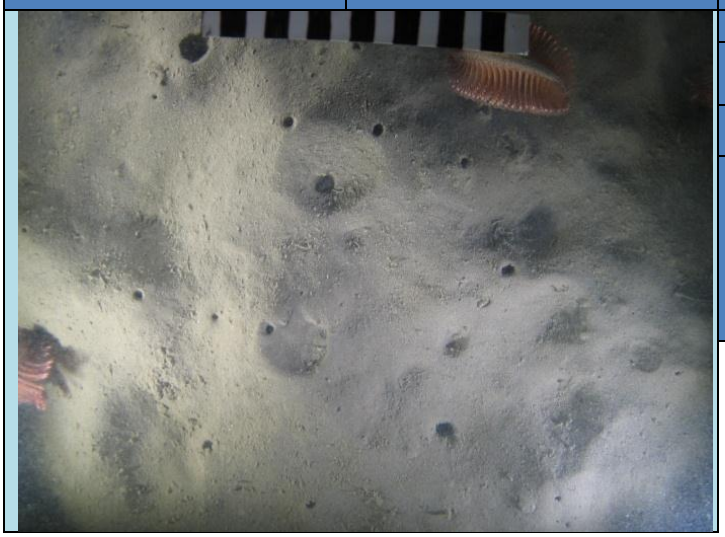
Site	41b	Date	06/06/11
		Time	16:33 Hrs
		Position	5802.788°N 0322.349°W
		Depth (m)	51.3
		Description	Mud. Sea pens, *Pennatula phosphorea*. Burrows and depressions from fauna.

Figure 18: Sea pens amongst the burrowed mud at Site 41.

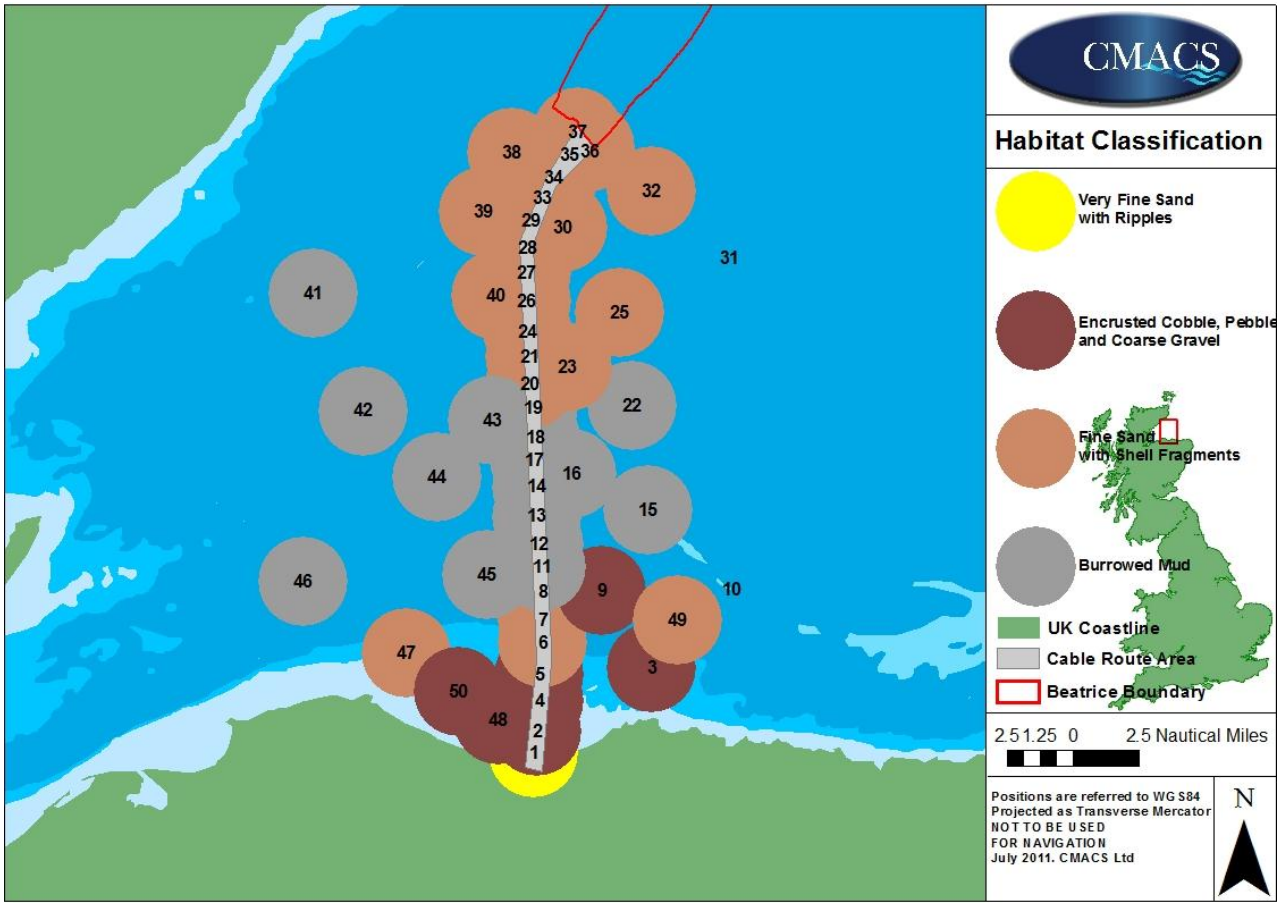


Figure 19: Habitat classification from camera survey

5. Discussion and Conclusions

The majority of the seabed along and around the cable route was dominated by fine-medium sands, often with varying amounts of shell fragments, or mud. Inshore sites had a harder substratum of cobbles, pebbles and gravel and even small boulders recorded from one of the sites. Moving offshore from this harder substratum sediments graded into sand with shell fragments and then to mud and silt at the deeper sites, which were located in the middle of the survey area. Beyond these deeper mud areas, as the seabed rises back up towards the Smith Bank, the substratum returned to the medium-fine sand with shell fragments as was recorded inshore from the deeper areas.

Analysis of the camera image survey found four main habitat types associated with these different sediment types, two of which (burrowed mud and fine-medium sand with shell fragments) dominated the survey area. Inshore the harder substratum habitat of cobbles, pebbles and gravels with encrusting epifauna is considered to be a small patch of cobble reef dominated mostly by tubeworms and barnacles, and ascribed to the biotope SS.SCS.CCS.Pomb *Pomatoceros triqueter* with barnacles, coralline algae and bryozoan crusts on unstable circalittoral cobbles and pebbles. This biotope may be considered as being potential Annex I cobble reef after descriptions in Irving (2009). However, until the extent of this area can be reviewed using the geophysical data, this is conjecture. Further information regarding this habitat will be issued for the EIA once the geophysical data has been reviewed.

The burrowed mud habitat, present in the deeper central part of the survey area had very little visible epifauna but did have a high amount of bioturbation as evidenced by visible depressions, burrows and tracks left by marine organisms. The identified habitat, SS. SMu.CFiMu.SpnMeg- sea pens and burrowing megafauna in circalittoral mud is listed on the 'Priority Marine Features in Scottish territorial waters' draft list provided by SNH.

This biotope is typical of the deep mud habitats and has been recorded in most of the Scottish sea lochs. It has also been observed in the north-eastern Irish Sea and is considered as being fairly extensive in the deeper areas of the North Sea (Hill, 2008).

No evidence of other potential Annex 1 habitats was found. The survey team had mind to investigate for and be aware of the potential presence of biogenic reef such as formed by aggregations of *Sabellaria spinulosa* or *Modiolus modious,* but no such habitat was found.

When geophysical data becomes available it will be possible to:

- More accurately map the biotopes
- Identify the presence of any anomalies that could represent interesting habitat features worthy of further investigation

This report will be used to inform the baseline for the Environmental Impact Assessment for the Beatrice Offshore Wind Farm. The results of the geophysical survey will be used to investigate the extent of these habitats and also look for further evidence of any priority marine features or potential Annex I habitats to provide a complete characterisation for the assessment.

The sites surveyed as part of this characterisation survey will also be useful as future reference sites for monitoring purposes. This is because of the close correlation of habitats with depth. Sites located on the cable route corridor (i.e. impact sites) were found to be very similar in both habitat and species to both near and far-field sites located within the same depth range.

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Appendices

Appendix 1: Camera Survey field notes

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
50a	06/06/11	09:25	18.0	5743.638 0309.115	5743.685 0309.141	1	Cobble & pebble. Some Serpulids.
50b	06/06/11	09:28	18.6	5743.638 0309.115	5743.686 0309.114	2	Cobble & pebble. Some Serpulids, 1 shell.
50c	06/06/11	09:31	18.8	5743.638 0309.115	5743.693 0309.110	3	Cobble, pebble & shell. Hydroid & Serpulids.
5a	06/06/11	10:14	22.2	5744.514 0301.813	5744.513 0301.817	4	Cobbles, Hydroids & barnacles.
5b	06/06/11	10:17	22.0	5744.514 0301.813	5744.522 0301.831	5	Cobble & pebble with barnacles & Serpulids.
5c	06/06/11	10:21	22.1	5744.514 0301.813	5744.521 0301.838	6	As above – coralline algae on pebble too.
6a	06/06/11	10:41	30.1	5746.011 0301.612	5746.010 0301.627	7	Shelly mud/sand – rippled.
6b	06/06/11	10:44	30.1	5746.011 0301.612	5746.013 0301.613	8	Muddy sand.
6c	06/06/11	10:47	30.4	5746.011 0301.612	5746.011 0301.612	9	Muddy sand & burrows.
7a	06/06/11	11:03	37.7	5747.123 0301.535	5747.123 0301.540	10	Muddy sand, burrows & some shell.
7b	06/06/11	11:06	37.9	5747.123 0301.535	5747.107 0301.551	11	Muddy sand & shell.
7c	06/06/11	11:09	37.9	5747.123 0301.535	5747.119 0301.542	12	Muddy sand, burrows & shell.
8a	06/06/11	11:36	55.8	5748.495 0301.597	5748.496 0301.609	13	Muddy sand & burrows.
8b	06/06/11	11:39	55.8	5748.495 0301.597	5748.493 0301.610	14	Muddy sand & burrows.
8c	06/06/11	11:41	56.1	5748.495 0301.597	5748.500 0301.602	15	Muddy sand & burrows.
20a	06/06/11	13:12	52.9	5758.453 0302.640	5758.451 0302.645	16	Muddy sand, some shell. Poss Alcyonidium
20b	06/06/11	13:14	53.5	5758.453 0302.640	5758.458 0302.636	17	Sand & shell. Sea pen.
20c	06/06/11	13:17	53.1	5758.453 0302.640	5758.462 0302.634	18	Sand & shell.
23a	06/06/11	13:41	55.9	5759.317 0259.301	5759.313 0259.301	19	Mud or sand with some shell.

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
23b	06/06/11	13:45	55.9	5759.317 0259.301	5759.314 0259.320	20	Sand & shell.
23c	06/06/11	13:47	55.9	5759.317 0259.301	5759.321 0259.322	21	Sand & shell. Possible burrows.
21a	06/06/11	14:12	55.6	5759.785 0302.652	5759.778 0302.638	22	Sand or mud, some shell.
21b	06/06/11	14:15	55.7	5759.785 0302.652	5759.788 0302.650	23	Sand/mud, burrows & animal tracks.
21c	06/06/11	14:17	55.6	5759.785 0302.652	5759.781 0302.638	24	Sand/mud & burrows.
24a	06/06/11	14:43	49.9	5800.966 0302.870	5800.966 0302.860	25	Mud/sand & burrows.
24b	06/06/11	14:45	52.7	5800.966 0302.870	5800.970 0302.870	26 & 27	Sand, shell, animal tracks, Goose Foot shell & burrows. 26 – Bad Image.
24c	06/06/11	14:48	52.9	5800.966 0302.870	5800.964 0302.874	28	Mud/sand & burrows.
41a	06/06/11	16:28	52.0	5802.783 0322.334	5802.762 0322.320	29	Mud/sand.
41b	06/06/11	16:33	51.3	5802.783 0322.334	5802.788 0322.349	30	Mud/sand & burrows. Pennatulacea Sea Pens.
41c	06/06/11	16:35	51.7	5802.783 0322.334	5802.784 0322.328	31	Mud & burrows.
42a	06/06/11	17:58	51.3	5757.171 0317.759	5757.170 0317.753	32	Mud & burrows.
42b	06/06/11	18:00	51.6	5757.171 0317.759	5757.165 0317.753	33	Mud & burrows.
42c	06/06/11	18:02	51.3	5757.171 0317.759	5757.164 0317.760	34	Mud & burrows.
9a	07/06/11	08:37	32.7	5748.525 0256.205	5748.538 0256.203	35	Cobble & pebble with epifauna. Boulders, Hydroids, Feather Stars (?) & Squat Lobster.
9b	07/06/11	08:41	32.1	5748.525 0256.205	5748.538 0256.203	36	Gravel & pebble with Serpulids & Hydroids.
9c	07/06/11	08:43	32.4	5748.525 0256.205	5748.542 0256.230	37	Cobble & pebble with Hydroids.
49a	07/06/11	09:28	39.6	5747.097 0249.410	5748.548 0256.246	38	Sand with worm tubes.
49b	07/06/11	09:30	40.0	5747.097 0249.410	5747.095 0249.427	39	Sand with shell.
49c	07/06/11	09:32	40.1	5747.097 0249.410	5747.101 0249.449	40	Sand with shell.
2a	07/06/11	11:50	10.6	5741.769 0302.113	5747.105 0249.461	41	Cobble & pebble with green and red algae. Butter fish seen.

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
2b	07/06/11	11:55	10.5	5741.769 0302.113	5741.758 0302.128	42 & 43	As above with Keel Worm and swimming crab.
2c	07/06/11	12:00	10.8	5741.769 0302.113	5741.770 0302.129	44	As for 2a.
48a	09/06/11	09:03	14.8	5742.314 0305.580	5742.318 0305.569	45	Pebble with red and brown algae.
48b	09/06/11	09:05	14.5	5742.314 0305.580	5742.315 0305.562	46	Gravel & pebble with red algae.
48c	09/06/11	09:07	14.7	5742.314 0305.580	5742.320 0305.574	47	As above.
1a	09/06/11	09:30	6.5	5740.744 0302.422	5740.746 0302.418	48	Rippled sand, worm casts seen on video.
1b	09/06/11	09:33	6.3	5740.744 0302.422	5740.740 0302.415	49	Cobble & pebble with barnacles & red, green & brown algae.
1c	09/06/11	09:35	6.4	5740.744 0302.422	5740.738 0302.405	50	Rippled sand.
4a	09/06/11	10:09	19.3	5743.217 0301.914	5743.214 0301.901	51	Pebble with abundant Keel Worm & red algae.
4b	09/06/11	10:12	19.5	5743.217 0301.914	5743.214 0301.879	52	Pebble with coralline & red algae & Keel Worms.
4c	09/06/11	10:14	19.2	5743.217 0301.914	5743.217 0301.879	53	Pebble with coralline & red algae & Keel Worms.
3a	09/06/11	11:06	26.1	5744.818 0251.759	5744.811 0251.755	54	Sandy gravel, pebble & cobble with *Ophiothrix fragilis*.
3b	09/06/11	11:09	26.2	5744.818 0251.759	5744.827 0251.734	55	Sandy gravel, pebble & cobble with *Ophiothrix fragilis*.
3c	09/06/11	11:12	26.2	5744.818 0251.759	5744.829 0251.754	56	Sandy gravel & pebble with coralline algae.
11a	10/06/11	09:44	80.1	5749.664 0301.686	5749.676 0301.692	57	Mud & burrows.
11b	10/06/11	09:45	80.3	5749.664 0301.686	5749.678 0301.680	58	Mud, burrows and Hydroids.
11c	10/06/11	09:46	80.1	5749.664 0301.686	5749.681 0301.666	59	Mud & burrows.
12a	10/06/11	10:03	84.5	5750.778 0301.853	5750.773 0301.840	60	Mud & burrows.
12b	10/06/11	10:05	84.9	5750.778 0301.853	5750.776 0301.829	61	Mud & burrows.
12c	10/06/11	10:07	84.5	5750.778 0301.853	5750.780 0301.820	62	Mud & burrows.
13a	10/06/11	10:42	82.3	5752.117 0302.131	5752.115 0302.126	63	Mud & burrows.
13b	10/06/11	10:44	82.2	5752.117 0302.131	5752.115 0302.118	64	Mud & burrows.

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
13c	10/06/11	10:46	82.1	5752.117 0302.131	5752.122 0302.109	65	Mud & burrows.
14a	10/06/11	11:08	84.8	5753.531 0302.132	5753.529 0302.128	66	Mud & burrows.
14b	10/06/11	11:10	84.9	5753.531 0302.132	5753.527 0302.124	67	Mud & burrows.
14c	10/06/11	11:12	84.7	5753.531 0302.132	5753.529 0302.113	68	Mud & burrows.
16a	10/06/11	11:49	86.9	5754.160 0258.939	5754.158 0258.938	69	Mud & burrows.
16b	10/06/11	11:54	87.0	5754.160 0258.939	5754.163 0258.916	70	Mud & burrows.
16c	10/06/11	11:57	87.0	5754.160 0258.939	5754.165 0258.925	71	Mud & burrows.
17a	10/06/11	12:19	84.7	5754.832 0302.274	5754.837 0302.274	72	Mud & burrows.
17b	10/06/11	12:20	84.4	5754.832 0302.274	5754.842 0302.277	73	Mud & burrows.
17c	10/06/11	12:23	84.3	5754.832 0302.274	5754.845 0302.273	74	Mud & burrows.
18a	10/06/11	12:40	81.7	5755.940 0302.218	5755.940 0302.223	75	Mud & burrows.
18b	10/06/11	12:42	81.7	5755.940 0302.218	5755.942 0302.203	76	Mud & burrows.
18c	10/06/11	12:45	81.6	5755.940 0302.218	5755.933 0302.206	77	Mud & burrows.
19a	10/06/11	13:32	56.2	5757.314 0302.426	5757.318 0302.443	78	Mud or sand with worm casts.
19b	10/06/11	13:35	56.4	5757.314 0302.426	5757.310 0302.434	79	Mud or sand with worm casts.
19c	10/06/11	13:37	56.3	5757.314 0302.426	5757.308 0302.439	80	Rippled sand or mud with shells.
26a	10/06/11	14:28	48.4	5802.459 0303.012	5802.461 0303.029	81	Rippled sand with some gravel.
26b	10/06/11	14:30	48.2	5802.459 0303.012	5802.459 0303.046	82	Sand & *Asterias rubens.* Whelk?
26c	10/06/11	14:31	48.5	5802.459 0303.012	5802.462 0303.054	83	Muddy sand & burrows.
27a	10/06/11	14:57	46.2	5803.806 0303.020	5803.813 0303.033	84	Mud or sand with shell fragments.
27b	10/06/11	14:58	45.8	5803.806 0303.020	5803.809 0303.054	85	Mud or sand with shell fragments & Hydroid.
27c	10/06/11	15:00	46.1	5803.806 0303.020	5803.810 0303.063	86	Sand & shell.

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
28a	10/06/11	15:18	43.3	5805.021 0302.936	5805.019 0302.954	87	Sand & shell fragments.
28b	10/06/11	15:20	43.4	5805.021 0302.936	5805.019 0302.958	88	Shelly sand.
28c	10/06/11	15:21	43.6	5805.021 0302.936	5805.020 0302.969	89	Sand & shell, possible pebble. Hydroids.
39a	10/06/11	16:06	48.0	5806.747 0306.900	5806.746 0306.915	90	Mud/sand & burrows.
39b	10/06/11	16:08	45.7	5806.747 0306.900	5806.747 0306.904	91	Mud or sand.
39c	10/06/11	16:10	48.1	5806.747 0306.900	5806.743 0306.921	92	Mud or sand. *Asterias rubens* seen in video.
40a	10/06/11	16:50	47.6	5802.745 0305.764	5802.741 0305.756	93	Sand & shell.
40b	10/06/11	16:52	47.4	5802.745 0305.764	5802.734 0305.770	94	Sand & shell.
40c	10/06/11	16:54	47.8	5802.745 0305.764	5802.742 0305.777	95	Sand & shell.
43a	10/06/11	17:50	60.6	5756.714 0306.036	5756.714 0306.041	96	Mud & burrows.
43b	10/06/11	17:53	58.5	5756.714 0306.036	5756.708 0306.055	97	Mud & burrows.
43c	10/06/11	17:55	59.7	5756.714 0306.036	5756.720 0306.057	98	Mud & burrows.
45a	10/06/11	19:07	94.8	5749.287 0306.611	5749.273 0306.600	99	Mud & burrows.
45b	10/06/11	19:10	94.8	5749.287 0306.611	5749.282 0306.605	100	Mud & burrows. Video missed – swapping discs.
45c	10/06/11	19:13	94.8	5749.287 0306.611	5749.272 0306.617	101	Mud & burrows.
29a	11/06/11	11:43	42.4	5802.320 0302.559	5802.323 0302.571	102	Very shelly sand.
29b	11/06/11	11:44	41.4	5802.320 0302.559	5802.322 0302.577	103	Very shelly sand. One brittle star probably *Ophiura ophiura*.
29c	11/06/11	11:46	42.5	5802.320 0302.559	5802.322 0302.588	104	Very shelly sand.
30a	11/06/11	12:07	45.3	5806.013 0259.753	5806.018 0259.761	105	Shelly sand.
30b	11/06/11	12:10	45.1	5806.013 0259.753	5806.012 0259.768	106	Very shelly sand. Hydroid.
30c	11/06/11	12:12	45.3	5806.013 0259.753	5806.012 0259.790	107	Shelly sand.
33a	11/06/11	12:32	43.3	5807.430 0301.554	5807.428 0301.564	108	Sand/mud with shell fragments & burrows.

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
33b	11/06/11	12:33	43.8	5807.430 0301.554	5807.432 0301.560	109	Sand/mud with shell fragments & burrows.
33c	11/06/11	12:34	43.7	5807.430 0301.554	5807.436 0301.569	110	Sand/mud with shell fragments & burrows.
34a	11/06/11	12:51	40.5	5808.412 0300.510	5808.412 0300.520	111	Muddy sand with shell.
34b	11/06/11	12:53	40.7	5808.412 0300.510	5808.416 0300.527	112	Muddy sand with shell.
34c	11/06/11	12:54	40.5	5808.412 0300.510	5808.421 0300.530	113	Muddy sand with shell.
38a	11/06/11	13:38	50.5	5809.622 0304.383	5809.627 0304.396	114	Muddy sand & burrows.
38b	11/06/11	13:39	50.6	5809.622 0304.383	5809.633 0304.395	115	Muddy sand & burrows. *Asterias rubens.*
38c	11/06/11	13:41	50.7	5809.622 0304.383	5809.640 0304.404	116	Muddy sand & burrows, worm tubes.
35a	11/06/11	14:39	34.6	5809.511 0258.997	5809.517 0258.999	117	Sand.
35b	11/06/11	14:42	34.9	5809.511 0258.997	5809.515 0259.022	118	Sand.
35c	11/06/11	14:44	34.6	5809.511 0258.997	5809.523 0259.042	119	Sand.
37a	11/06/11	14:59	34.3	5810.614 0258.339	5810.621 0258.346	120	Sand.
37b	11/06/11	15:00	35.1	5810.614 0258.339	5810.626 0258.352	121	Sand.
37c	11/06/11	15:02	34.9	5810.614 0258.339	5810.622 0258.368	122	Sand.
36a	11/06/11	15:18	36.5	5809.859 0257.215	5809.861 0257.224	123	Sand.
36b	11/06/11	15:19	36.5	5809.859 0257.215	5809.862 0257.239	124	Sand & shell with Hydroid.
36c	11/06/11	15:21	36.5	5809.859 0257.215	5809.863 0257.244	125	Sand & shell.
32a	11/06/11	16:00	38.9	5807.776 0251.648	5807.777 0251.652	126	Sand.
32b	11/06/11	16:02	38.8	5807.776 0251.648	5807.773 0251.663	127	Sand.
32c	11/06/11	16:03	38.9	5807.776 0251.648	5807.773 0251.686	128	Sand & shell. Worm tubes.
25a	11/06/11	17:01	52.5	5801.931 0254.582	5801.924 0254.579	129	Mud & burrows.
25b	11/06/11	17:05	52.7	5801.931 0254.582	5801.921 0254.566	130	Mud/sand with Hydroid or erect Bryozoa.

Site	Date	Time	Depth (m)	Fix at surface	Fix on bottom	Image Number	Description & notes
25c	11/06/11	17:06	52.6	5801.931 0254.582	5801.911 0254.581	131	Sand with burrows.
22a	11/06/11	17:58	79.7	5757.439 0253.451	5757.429 0253.462	132	Mud & burrows.
22b	11/06/11	18:01	79.6	5757.439 0253.451	5757.415 0253.472	133	Mud & burrows.
22c	11/06/11	18:02	79.8	5757.439 0253.451	5757.416 0253.480	134	Mud & burrows.
15a	11/06/11	18:59	91.7	5752.457 0251.977	5752.450 0251.981	135	Mud & burrows.
15b	11/06/11	19:02	91.7	5752.457 0251.977	5752.427 0251.987	136	Mud & burrows.
15c	11/06/11	19:05	92.1	5752.457 0251.977	5752.414 0251.993	137	Mud & burrows.
47a	12/06/11	09:10	24.1	5745.520 0313.830	5745.523 0313.840	138	Sand.
47b	12/06/11	09:14	24.2	5745.520 0313.830	5745.523 0313.824	139	Sand.
47c	12/06/11	09:16	24.1	5745.520 0313.830	5745.532 0313.824	140	Sand, burrows & worm tubes.
44a	12/06/11	10:41	65.2	5753.998 0311.092	5753.996 0311.085	141	Mud & burrows.
44b	12/06/11	10:43	64.8	5753.998 0311.092	5753.992 0311.072	142	Mud & burrows.
44c	12/06/11	10:45	64.9	5753.998 0311.092	5753.987 0311.069	143	Mud & burrows.
46a	12/06/11	12:08	56.7	5748.932 0323.135	5748.930 0323.126	144	Mud & burrows.
46b	12/06/11	12:11	56.4	5748.932 0323.135	5748.929 0323.148	145	Mud & burrows.
46c	12/06/11	12:13	56.5	5748.932 0323.135	5748.932 0323.141	146	Mud & burrows.

Appendix 2: Grab Survey Field Notes

Site	Date	Time	Fix	Vol (L)	Depth (m)	Sediment Description
49	09/06/11	11:47	5747.106 0249.445	5	40.1	Coarse sand & shell.
1	09/06/11	09:45	5740.740 0302.406	4	6.5	Hard packed fine sand.
12	10/06/11	10:17	5750.778 0301.850	10	84.0	Sandy mud.
12 contaminants	10/06/11	10:25	5750.768 0301.813	10	84.0	Sandy mud.
14	10/06/11	11:22	5753.530 0302.134	10	84.6	Sandy mud.
14 contaminants	10/06/11	11:28	5753.527 0302.139	10	84.5	Sandy mud.
18	10/06/11	12:59	5755.931 0302.203	10	82.0	Sandy mud.
18 contaminants	10/06/11	13:16	5755.928 0302.230	8	81.8	Sandy mud.
26	10/06/11	14:39	5802.461 0303.047	4	48.4	Fine sand with shell fragments.
28	10/06/11	15:35	5805.021 0302.955	2.5	43.3	Sand & shell.
34	11/06/11	03:03	5808.418 0300.509	4	40.3	Sand with some shell.
34 contaminants	11/06/11	13:15	5808.412 0300.504	3	40.4	Sand.
38	11/06/11	13:53	5809.635 0304.372	3	50.5	Fine sand with some shell.
38 contaminants	11/06/11	14:08	5809.633 0304.374	4	50.5	Sand with some shell.
25	11/06/11	17:15	5801.917 0254.580	4	52.5	Fine sand. One Hermit Crab.
22	11/06/11	18:12	5757.425 0253.456	10	80.1	Fine sand & mud.
15	11/06/11	19:21	5752.419 0251.994	10	91.8	Muddy fine sand.
47	12/06/11	09:22	5745.533 0313.822	4	24.2	Medium fine sand.

Site	Date	Time	Fix	Vol (L)	Depth (m)	Sediment Description
7	12/06/11	11:20	5747.112 0301.542	5	40.1	Medium sand with some shell.
21	12/06/11	14:25	5759.793 0302.652	4	55.1	Fine sand with some shell.
41	12/06/11	17:07	5802.783 0322.333	2.5	51.6	Fine sand.
44	12/06/11	10:53	5753.997 0311.081	5	64.5	Fine sand & mud.

Appendix 3: Photographs of Grab Samples

Site	1	Date	09/06/11
		Time	09:45 Hrs
		Position	5740.740°N 0302.406°W
		Volume (l)	4
		Depth (m)	6.5
		Substratum	Hard packed fine sand.

Site	7	Date	06/06/11
		Time	11:20 Hrs
		Position	5747.112°N 0301.542°W
		Volume (l)	5
		Depth (m)	40.1
		Substratum	Medium sand with some shell

Site	12	Date	10/06/11
		Time	10:17 Hrs
		Position	5750.778°N 0301.850°W
		Volume (l)	10
		Depth (m)	84
		Substratum	Sandy mud.

Site	12 contaminants

Date	10/06/11
Time	10:25 Hrs
Position	5750.768°N 0301.831°W
Volume (l)	10
Depth (m)	84
Substratum	Sandy mud.

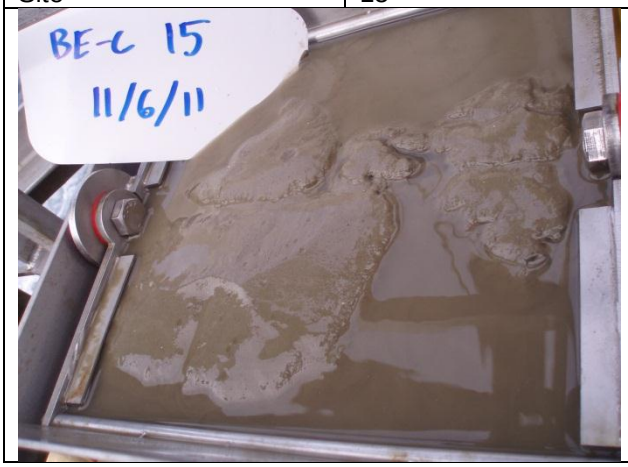
Site	14

Date	10/06/11
Time	11:22 Hrs
Position	5753.530°N 0302.134°W
Volume (l)	10
Depth (m)	84.6
Substratum	Sandy mud.

Site	14 contaminants

Date	10/06/11
Time	11:28 Hrs
Position	5753.527°N 0302.139°W
Volume (l)	10
Depth (m)	84.5
Substratum	Sandy mud.

Site	15

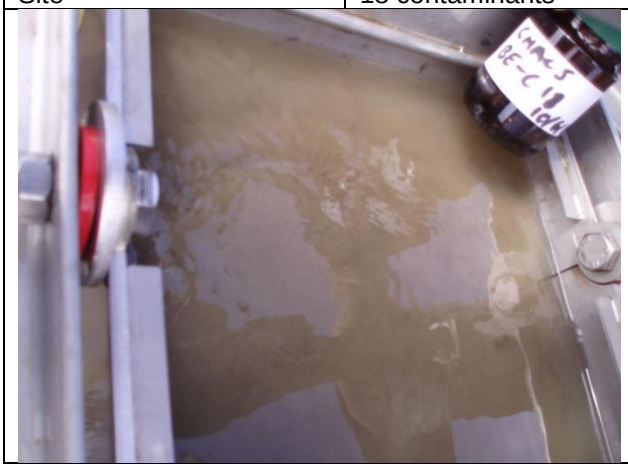


Date	11/06/11
Time	19:21 Hrs
Position	5752.419°N 0251.994°W
Volume (l)	10
Depth (m)	91.8
Substratum	Muddy fine sand.

Site	18

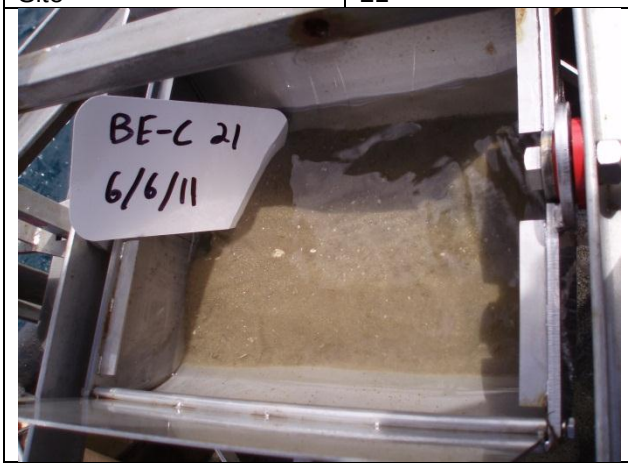
Date	10/06/11
Time	12:59 Hrs
Position	5755.931°N 0302.203°W
Volume (l)	10
Depth (m)	82.0
Substratum	Sandy mud.

Site	18 contaminants



Date	10/06/11
Time	13:16 Hrs
Position	5755.928°N 0302.230°W
Volume (l)	8
Depth (m)	81.8
Substratum	Sandy mud.

Site	21



Date	06/06/11
Time	14:25 Hrs
Position	5759.793°N 0302.652°W
Volume (l)	4
Depth (m)	55.1
Substratum	Fine sand with some shell.

Site	22

Date	11/06/11
Time	18:12 Hrs
Position	5757.425°N 0253.456°W
Volume (l)	10
Depth (m)	80.1
Substratum	Fine sand & mud.

Site	25

Date	11/06/11
Time	17:15 Hrs
Position	5801.917°N 0254.580°W
Volume (l)	4
Depth (m)	52.5
Substratum	Fine sand. One Hermit Crab.

Site	26

Date	10/06/11
Time	14:39 Hrs
Position	5802.461°N 0303.047°W
Volume (l)	4
Depth (m)	48.4
Substratum	Fine sand with shell fragments.

Site	28

Date	10/06/11
Time	15:35 Hrs
Position	5805.021°N 0302.955°W
Volume (l)	2.5
Depth (m)	43.3
Substratum	Sand & shell.

Site	34

Date	11/06/11
Time	13:03 Hrs
Position	5808.418°N 0300.504°W
Volume (l)	4
Depth (m)	40.3
Substratum	Sand with some shell.

Site	34 contaminants

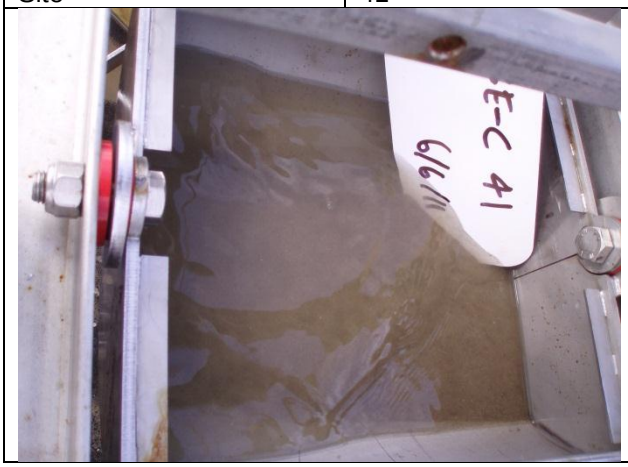
Date	11/06/11
Time	13:15 Hrs
Position	5808.412°N 0300.504°W
Volume (l)	3
Depth (m)	40.4
Substratum	Sand.

Site	38

Date	11/06/11
Time	13:53 Hrs
Position	5809.635°N 0304.372°W
Volume (l)	3
Depth (m)	50.5
Substratum	Fine sand with some shell.

Site	38 contaminants

Date	11/06/11
Time	14:08 Hrs
Position	5809.633°N 0304.374°W
Volume (l)	4
Depth (m)	50.5
Substratum	Sand with some shell.

Site	41	Date	06/06/11
		Time	17:07 Hrs
		Position	5802.783°N 0322.333°W
		Volume (l)	2.5
		Depth (m)	51.6
		Substratum	Fine sand.

Site	42	Date	06/06/11
		Time	18:15 Hrs
		Position	°N °W
		Volume (l)	6
		Depth (m)	53.0
		Substratum	Fine sand.

Site	44	Date	12/06/11
		Time	10:53 Hrs
		Position	5753.997°N 0311.081°W
		Volume (l)	5
		Depth (m)	64.5
		Substratum	Fine sand & mud.

Site	47

Date	12/06/11
Time	09:22 Hrs
Position	5753.997°N 0311.081°W
Volume (l)	5
Depth (m)	64.5
Substratum	Fine sand & mud.

Site	49

Date	09/06/11
Time	11:47 Hrs
Position	5747.174°N 0317.760°W
Volume (l)	5
Depth (m)	40.1
Substratum	Coarse sand & shell.

Appendix 4: Physical Sediment Analysis Results

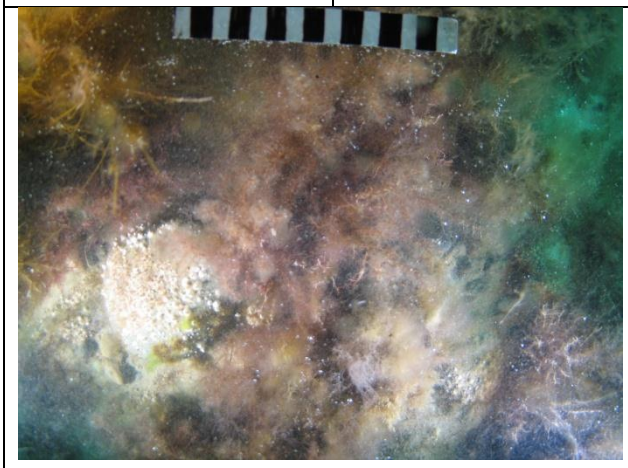
		Raw Data												Summary Statistics and Descriptors					
Site	LOI %	63 mm	31.5 mm	16 mm	8 mm	4 mm	2 mm	1 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	<0.063 mm	Mean phi	Skewness	Kurtosis	Classification after Buchanan	Folk Triangles after BGS	Sorting
1	0.411	0.000	1.028	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.321	0.518	0.584	Sand	Very Fine Sand	Moderately Well Sorted
7	0.439	0.016	2.789	0.000	0.100	0.356	0.451	0.136	0.023	0.068	0.312	0.000	0.008	2.416	0.752	1.250	Slightly Gravelly Sand	Fine Sand	Moderately Sorted
12	3.453	0.016	2.789	0.000	0.100	0.356	0.451	0.136	0.023	0.068	0.312	0.000	0.008	4.473	1.674	0.941	Muddy Sand	Very Coarse Silt	Poorly Sorted
14	2.894	0.000	0.858	0.000	0.030	0.428	0.248	0.017	8.216	0.103	0.409	0.000	0.000	4.895	1.560	0.820	Sandy Mud	Very Coarse Silt	Poorly Sorted
15	3.921	0.000	1.028	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.912	1.560	0.814	Sandy Mud	Very Coarse Silt	Poorly Sorted
18	2.747	2.608	4.610	0.000	3.387	3.459	3.992	4.262	0.275	7.436	12.460	1.350	8.016	4.322	2.553	2.140	Gravelly Muddy Sand	Very Coarse Silt	Very Poorly Sorted
21	0.904	49.305	12.118	0.000	26.879	23.196	12.569	7.260	1.679	21.421	46.950	3.090	54.281	2.676	1.099	1.500	Sand	Fine Sand	Poorly Sorted
22	3.691	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.625	1.507	0.981	Muddy Sand	Very Coarse Silt	Poorly Sorted
25	1.740	0.117	4.754	0.003	0.243	0.258	0.491	0.265	0.009	0.148	1.322	0.010	0.045	3.175	1.640	1.968	Slightly Gravelly Muddy Sand	Very Fine Sand	Poorly Sorted
26	1.005	0.000	5.307	0.000	1.350	2.431	0.492	3.844	0.000	0.816	7.072	0.572	0.698	2.927	0.805	3.631	Sand	Fine Sand	Moderately Sorted
28	0.950	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.068	1.388	1.955	Gravelly Sand	Fine Sand	Poorly Sorted
34	0.368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.145	0.515	0.583	Sand	Fine Sand	Moderately Well Sorted
38	1.320	0.000	0.858	0.000	0.030	0.428	0.248	0.017	8.216	0.103	0.409	0.000	0.000	2.451	0.873	1.426	Sand	Fine Sand	Moderately Sorted
41	1.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.020	0.963	1.851	Sand	Very Fine Sand	Moderately Sorted
44	1.637	0.015	4.085	47.379	10.012	4.685	15.049	12.985	35.132	15.710	0.832	46.325	1.374	3.598	1.201	1.839	Muddy Sand	Very Fine Sand	Poorly Sorted
47	0.277	0.000	4.404	2.792	5.903	1.720	19.972	5.155	40.677	6.116	0.915	18.288	0.642	2.076	0.639	0.891	Sand	Fine Sand	Moderately Well Sorted
49	0.568	47.976	60.076	49.827	52.085	63.322	46.786	66.083	14.001	48.166	29.720	30.317	34.951	1.774	0.982	1.250	Slightly Gravelly Sand	Medium Sand	Moderately Sorted

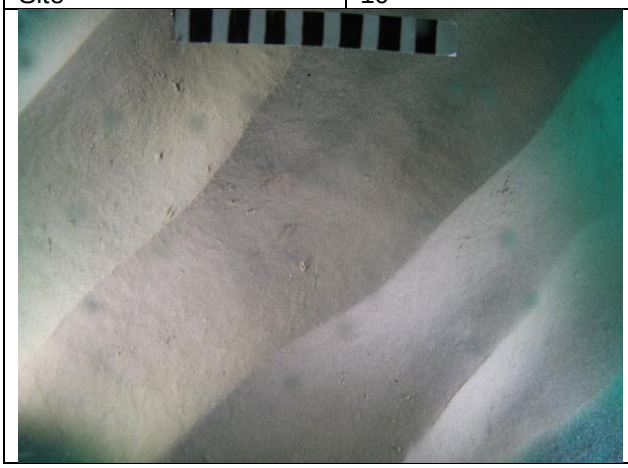
Appendix 5: Chemical Sediment Analysis Results

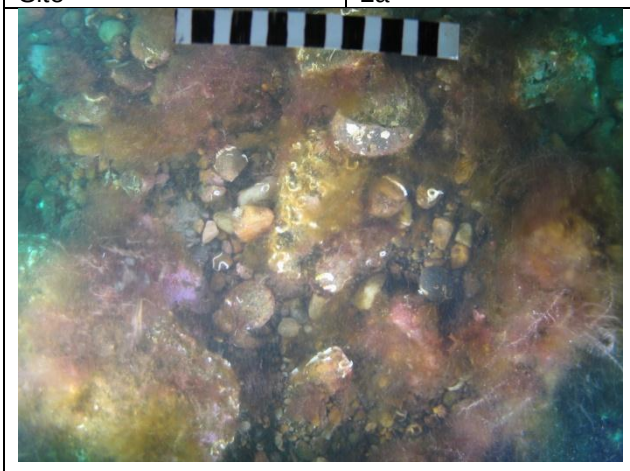
	C14	C34	C12	C18	C38
Arsenic	3.5	3.6	3.1	3.4	2.9
Barium	33	13	37	33	24
Cadmium	0.2	< 0.1	0.2	0.2	< 0.1
Chromium	11	6	10	12	9
Copper	4	4	3	4	2
Lead	5	5	5	5	4
Mercury	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	7	3	6	7	3
Vanadium	12	6	11	12	8
Tin	< 1	< 1	< 1	< 1	8
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Chrysene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	0.2	< 0.1	< 0.1	0.1	< 0.1
Pyrene	< 0.1	< 0.1	< 0.1	0.2	< 0.1
PAH	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
EPH (C10-C40)	< 10	< 10	< 10	< 10	< 10
PCB	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4,4'-Trichlorobiphenyl PCB 28	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2',5,5'-Tetrachlorobiphenyl PCB 52	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,3',4,4',5-Pentachlorobiphenyl PCB 118	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Organo Tin Compounds	< 10	< 10	< 10	< 10	< 10

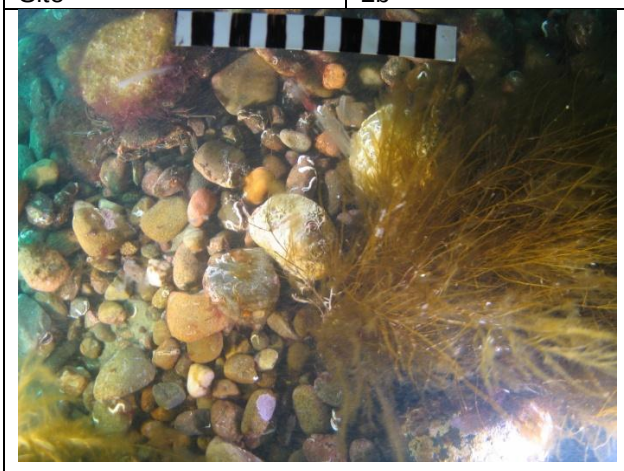
Appendix 6: Camera Images with analysis

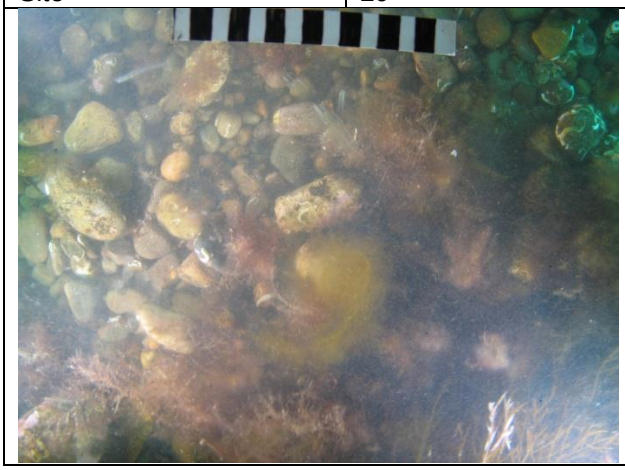
Site	1a	Date	09/06/11
		Time	09:30 Hrs
		Position	5740.746°N 0302.418°W
		Depth (m)	6.5
		Description	Very fine sand with large distinct sand ripples. Tubeworm cast top centre.

Site	1b	Date	09/06/11
		Time	09:33 Hrs
		Position	5740.740°N 0302.415°W
		Depth(m)	6.3
		Description	Barnacle encrusted cobble and coarse pebbles. Filamentous red and green algae. Possible hydroids top right and hydroid (*Kirchenpaueria pinnata*) bottom right. *Desmarestia acueleata* top left.

Site	1c	Date	09/06/11
		Time	09:35 Hrs
		Position	5740.738°N 0302.405°W
		Depth (m)	6.4
		Description	Very fine sand with large distinct sand ripples. Possible tubeworm hole top centre.

Site	2a	Date	07/06/11
		Time	11:50 Hrs
		Position	5747.105°N 0249.461°W
		Depth (m)	10.6
		Description	*Pomatoceros triqueter* encrusted cobble, pebble and coarse gravel. Filamentous red and green algae. Very small amounts of *Flustra foliacea* bottom right. Encrusting bryozoan on cobble top right.

Site	2b	Date	07/06/11
		Time	11:55 Hrs
		Position	5741.758°N 0302.128°W
		Depth (m)	10.5
		Description	*Pomatoceros triqueter* encrusted cobble, pebble and coarse gravel. Velvet swimming crab, *Necora puber* top left. Large amount of brown algae, *Desmarestia aculeata*. Encrusting bryozoans on cobble bottom right.

Site	2c	Date	07/06/11
		Time	12:00 Hrs
		Position	5741.770°N 0302.129°W
		Depth (m)	10.8
		Description	*Pomatoceros triqueter* encrusted cobble, pebble and coarse gravel. Filamentous red algae. Brown algae, *Desmarestia aculeata* bottom right.

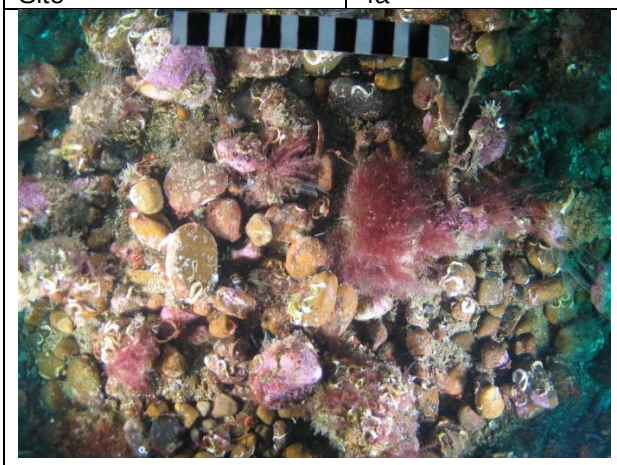
Site	3a
	

Date	09/06/11
Time	11:06 Hrs
Position	5744.827°N 0251.755°W
Depth (m)	26.1
Description	Sandy gravel with some pebbles, cobble and small boulder. Brittle stars, *Ophiocomina nigra* and *Ophiothrix fragilis*. Encrusting pink algae, *Lithothamnion sp.* on cobble and boulder. Small amount of *Pomatoceros triqueter*. Indiscernible sea urchin top left.

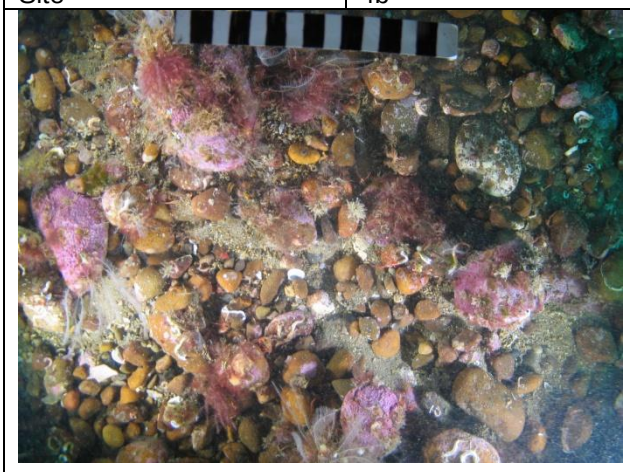
Site	3b
	

Date	09/06/11
Time	11:09 Hrs
Position	5744.827°N 0251.734°W
Depth (m)	26.2
Description	Sandy gravel and pebbles. Brittle stars,*Ophiocomina nigra and Ophiothrix fragilis* Encrusting pink algae, *Lithothamnion sp.* on pebbles. Small amount of *Pomatoceros triqueter*.

Site	3c	Date	09/06/11
		Time	11:12 Hrs
		Position	5744.829°N 0251.754°W
		Depth (m)	26.2
		Description	Coarse sand/fine shell fragments, gravel and pebbles. Squat lobster, *Galathea sp.* bottom centre. Hydroid, *Kirchenpaueria pinnata* top right. Encrusting pink algae,*Lithothamnion sp.* on pebbles. Small amount of *Pomatoceros triqueter*. Indiscernible brittle star (legs protruding from under pebble) bottom right.

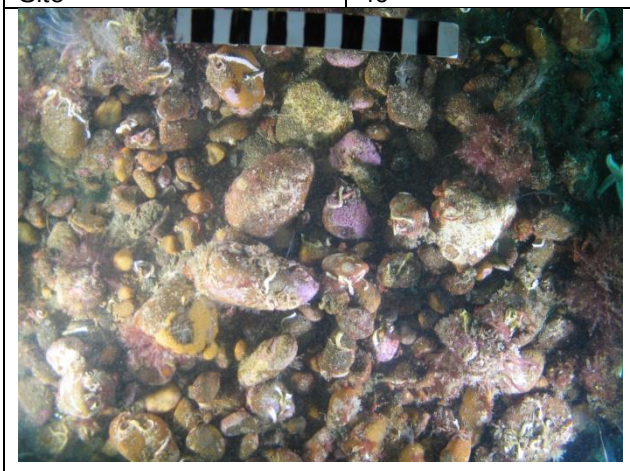
Site	4a	Date	09/06/11
		Time	10:09 Hrs
		Position	5743.214°N 0301.901°W
		Depth (m)	19.3
		Description	*Pomatoceros triqueter* encrusted cobbles, pebbles and coarse gravel. Squat lobsters, *Munida rugosa* and *Galathea sp.*. Brittlestar, *Ophiura sp.* bottom left. Hydroid, *Kirchenpaueria pinnata*. *Flustra foliacea* centre right. Encrusting pink algae, *Lithothamnion sp..* Filamentous red algae. Unidentified white sponge in places – bottom right of scale bar.

Site	4b

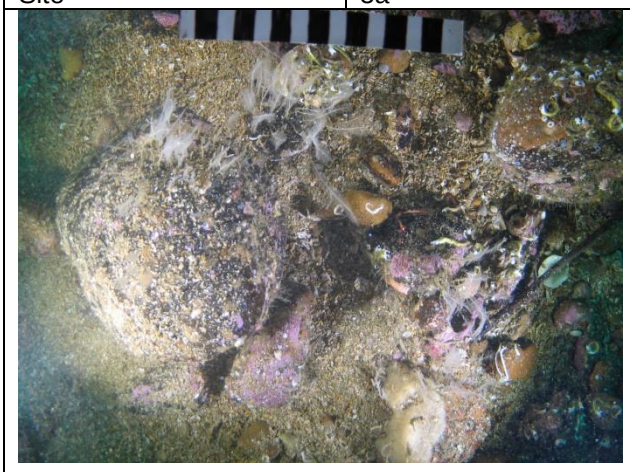


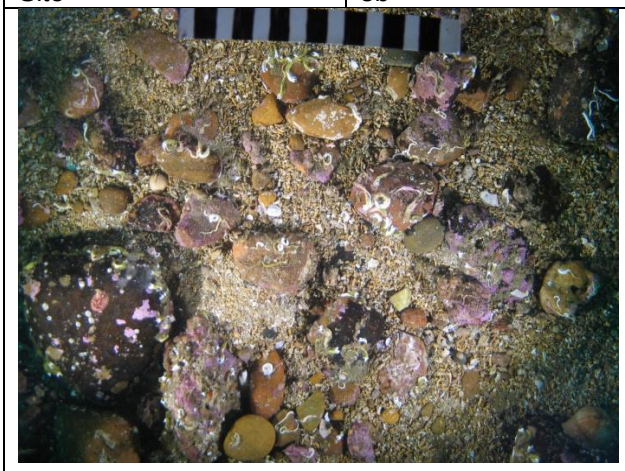
Date	09/06/11
Time	10:12 Hrs
Position	5743.214°N 0301.879°W
Depth (m)	19.5
Description	*Pomatoceros triqueter* encrusted cobbles, pebbles and coarse gravel. Squat lobsters, *Munida rugosa* and *Galathea sp.* Hydroid, *Kirchenpaueria pinnata*. Encrusting pink algae, *Lithothamnion sp.* Filamentous red algae. Small patches of *Flustra foliacea.* Unidentified white sponge.

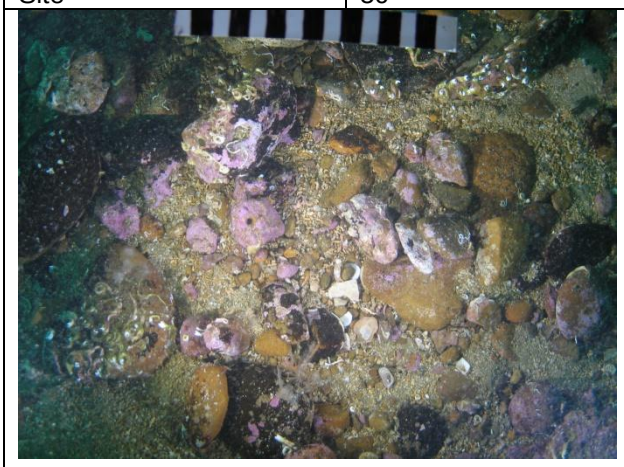
Site	4c



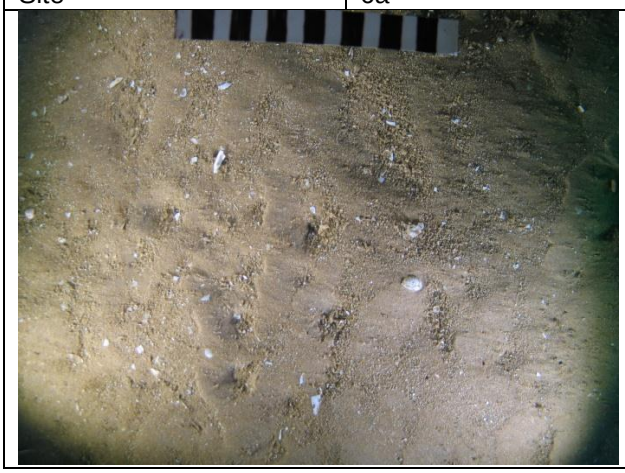
Date	09/06/11
Time	10:14 Hrs
Position	5743.217°N 0301.879°W
Depth (m)	19.2
Description	*Pomatoceros triqueter* encrusted cobbles, pebbles and coarse gravel. Squat lobsters, *Munida rugosa* and *Galathea sp.* Hydroid, *Kirchenpaueria pinnata*. Encrusting pink algae, *Lithothamnion sp.* Filamentous red algae. Small patches of *Flustra foliacea.* Indiscernible starfish overturned centre right (likely *A.rubens*).

Site	5a	Date	06/06/11
		Time	10:14 Hrs
		Position	5744.513°N 0301.817°W
		Depth (m)	22.2
		Description	Coarse sand/fine shell fragments, pebbles and cobble. Some encrusting *Pomatoceros triqueter* and unidentified barnacles. Squat lobster,*Munida rugosa* centre. Hydroid, *Kirchenpaueria pinnata*. Encrusting pink algae, *Lithothamnion sp.* Large white sponge on cobble bottom right. *Lanice conchilega* top left.

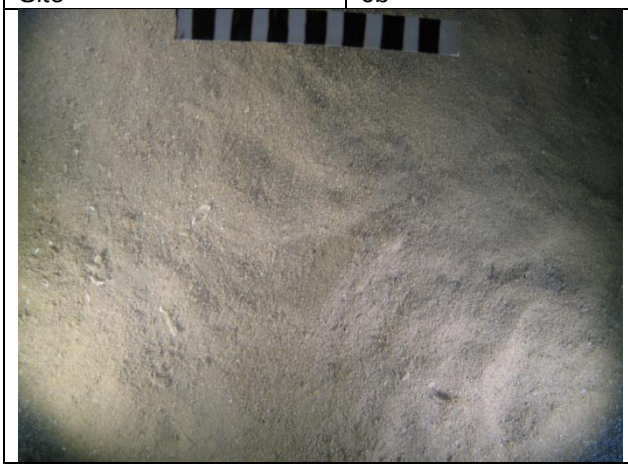
Site	5b	Date	06/06/11
		Time	10:17 Hrs
		Position	5744.522°N 0301.831°W
		Depth (m)	22.0
		Description	Coarse sand/fine shell fragments, pebbles and cobble with encrusting *Pomatoceros triqueter*. Encrusting pink algae, *Lithothamnion sp* Chiton on cobble bottom left. Part buried bivalve shells. Some hydroid on cobble bottom left. *Lanice conchilega* bottom right.

Site	5c
	

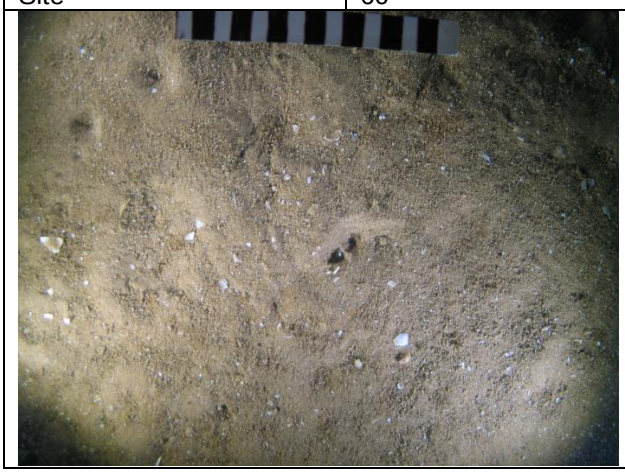
Date	06/06/11
Time	10:21 Hrs
Position	5744.521°N 0301.838°W
Depth (m)	22.1
Description	Coarse sand/fine shell fragments, pebbles and cobble. Encrusting *Pomatoceros triqueter*. Hydroid, *Kirchenpaueria pinnata* bottom centre. Encrusting pink algae, *Lithothamnion sp.* *Lanice conchilega* centre right amongst pebbles.

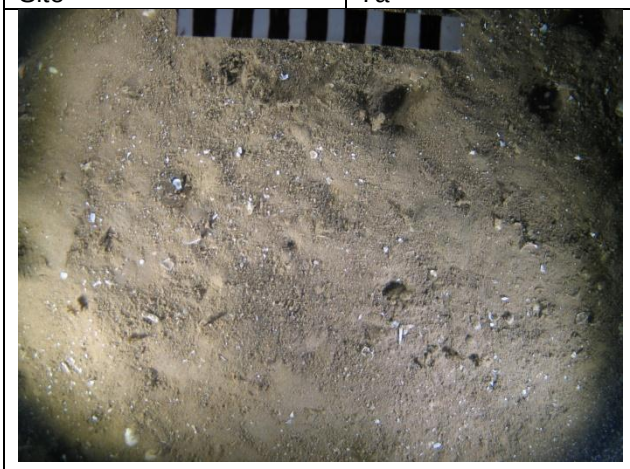
Site	6a
	

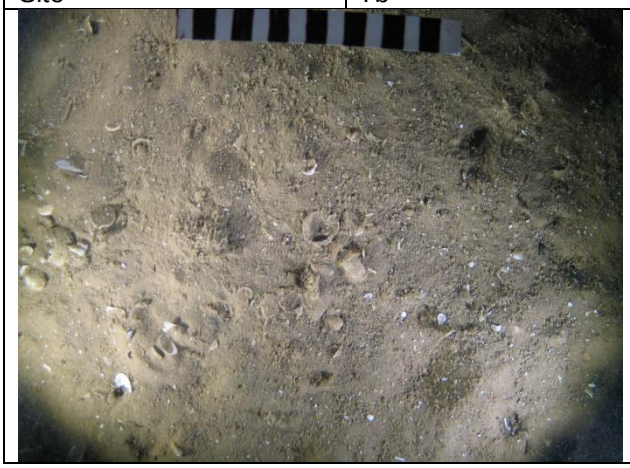
Date	06/06/11
Time	10:41 Hrs
Position	5746.010°N 0301.627°W
Depth (m)	30.1
Description	Fine sand and shell fragments with some discernible ripples. No obvious epifauna

Site	6b
	

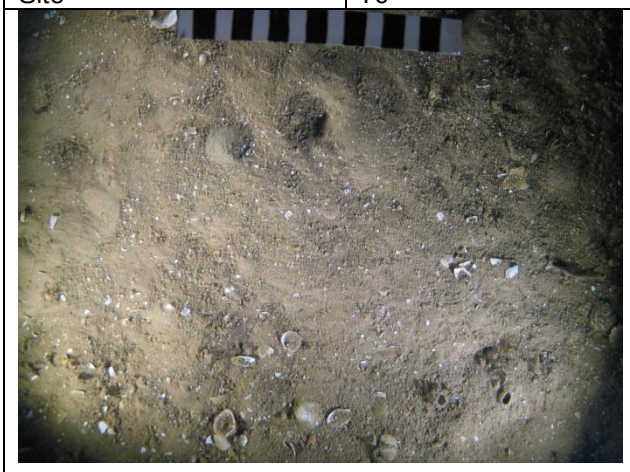
Date	06/06/11
Time	10:44 Hrs
Position	5746.0.13°N 0301.613°W
Depth (m)	30.1
Description	Fine sand/mud. Very small amount of shell fragments. Possible *Lanice conchilega* bottom right.

Site	6c	Date	06/06/11
		Time	10:47 Hrs
		Position	5746.011°N 0301.612°W
		Depth (m)	30.4
		Description	Fine sand and small amount of shell fragments with some discernible ripples. Burrows with evidence of bioturbation.

Site	7a	Date	06/06/11
		Time	11:03 Hrs
		Position	5747.123°N 0301.540°W
		Depth (m)	37.7
		Description	Fine sand/mud with small amount of shell fragments. Burrows and protruding worm tubes. Small amount of hydroid top right.

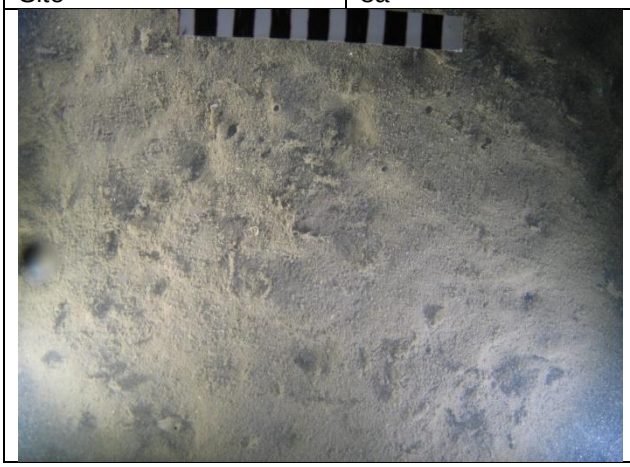
Site	7b	Date	06/06/11
		Time	11:06 Hrs
		Position	5747.107°N 0301.551°W
		Depth (m)	37.9
		Description	Very fine sand/mud overlying shell fragments. *Lanice conchilega* bottom left of scale bar. Burrow top right.

Site	7c



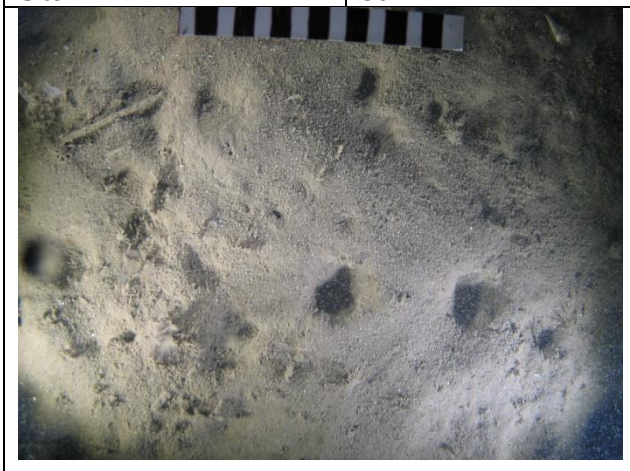
Date	06/06/11
Time	11:09 Hrs
Position	5747.119°N 0301.542°W
Depth (m)	37.9
Description	Fine sand/mud and some shell fragments in places. Worm tubes (some large) protruding sediment surface bottom right and left. Burrow below scale bar centre.

Site	8a

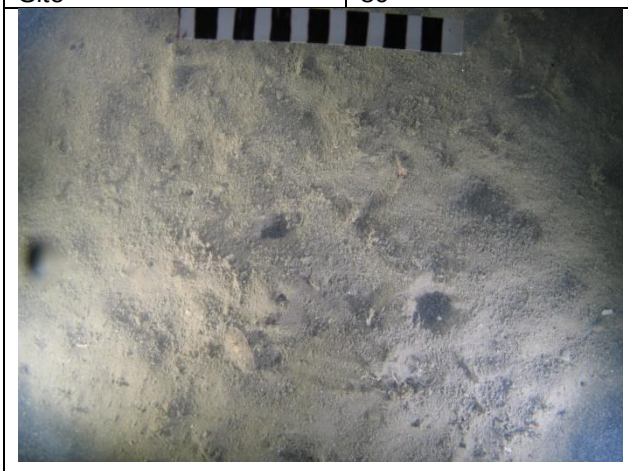


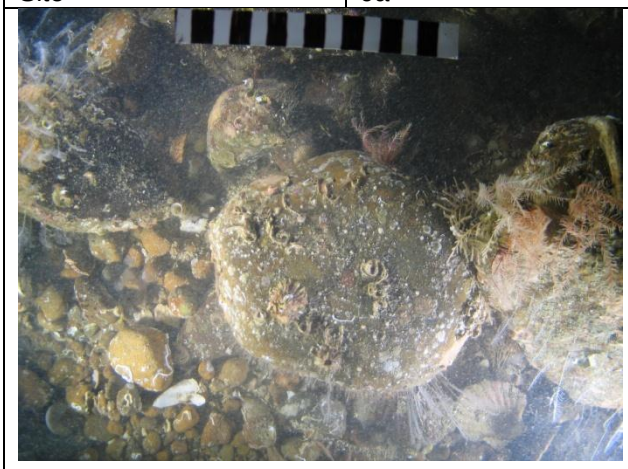
Date	06/06/11
Time	11:36 Hrs
Position	5748.496°N 0301.609°W
Depth (m)	55.8
Description	Very fine sand/mud. Worm tubes below scale bar. Small amounts of hydroid in centre. *Lanice conchilega* bottom right of scale bar. Numerous burrows.

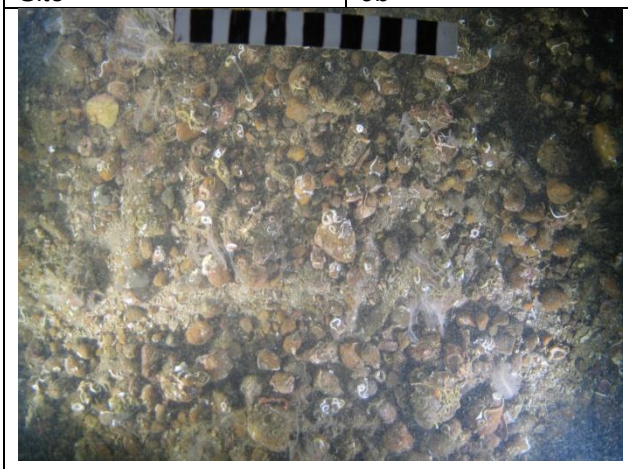
Site	8b



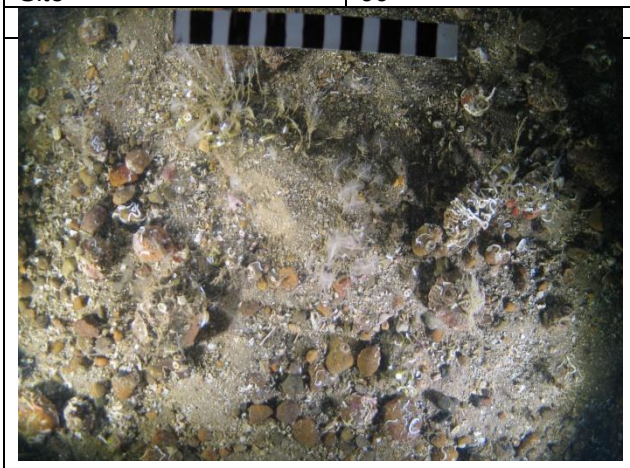
Date	06/06/11
Time	11:39 Hrs
Position	5748.493°N 0301.610°W
Depth (m)	55.8
Description	Very fine sand/mud. *Lanice conchilega* in places. Gastropod shell to right of scale bar and hydroids below right of scale bar. Unidentified white hydroid bottom left and top left. Burrows (some large).

Site	8c	Date	06/06/11
		Time	11:41 Hrs
		Position	5748.500°N 0301.602°W
		Depth (m)	56.1
		Description	Very fine sand/mud. Worm tubes right and left of scale bar. Unidentified white hydroid bottom centre. Burrows (some large).

Site	9a	Date	07/06/11
		Time	08:37 Hrs
		Position	5748.538°N 0256.203°W
		Depth (m)	55.8
		Description	Boulders, cobble and pebble. Some encrusting *Pomatoceros triqueter.* Feather stars, *Antedon bifida*. Hydroid, *Kirchenpaueria pinnata* and other *Plumulariidae sp.* on boulder top left and bottom right. *Scallop sp.* shells amongst substrate. Single large worm tube centre left.

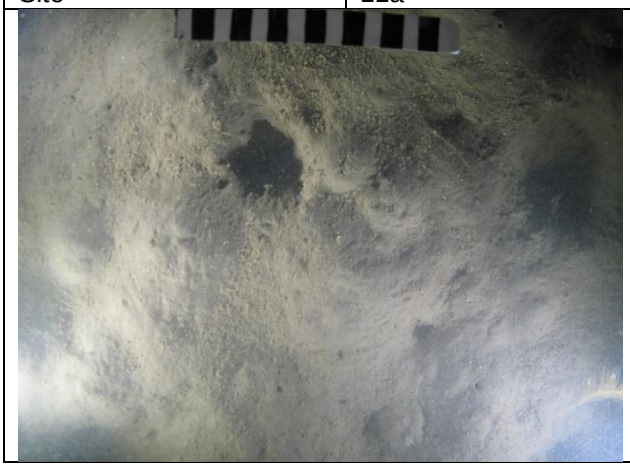
Site	9b	Date	07/06/11
		Time	08:41 Hrs
		Position	5748.538°N 0256.203°W
		Depth (m)	55.8
		Description	Pebbles and sandy gravel with encrusting *Pomatoceros triqueter* in places. Hydroid, *Kirchenpaueria pinnata* and other bottom centre. Possible squat lobster centre bottom. Cluster of worm tubes (likely *Serpulid sp.*) right centre.

Site	9c



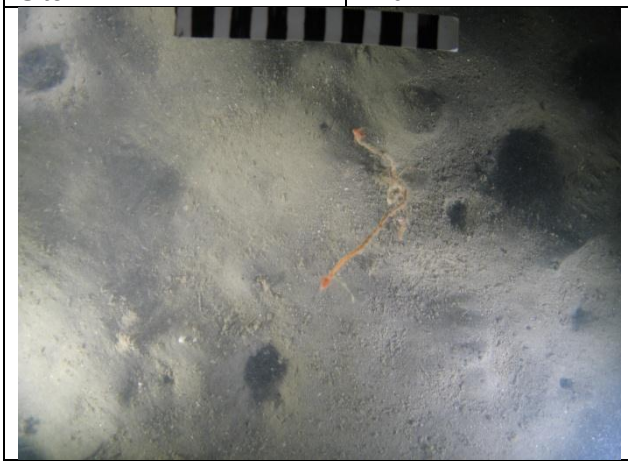
Date	07/06/11
Time	08:43 Hrs
Position	5748.542°N 0256.230°W
Depth (m)	56.1
Description	Pebbles and sandy gravel with some small shell fragments. Some encrusting *Pomatoceros triqueter*. Hydroid, *Kirchenpaueria pinnata* and other *Plumulariidae sp. Lanice conchilega* top and bottom right. Squat lobster centre right.

Site	11a

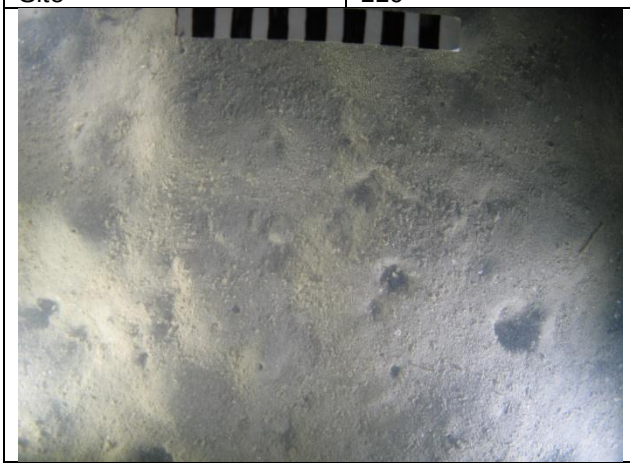


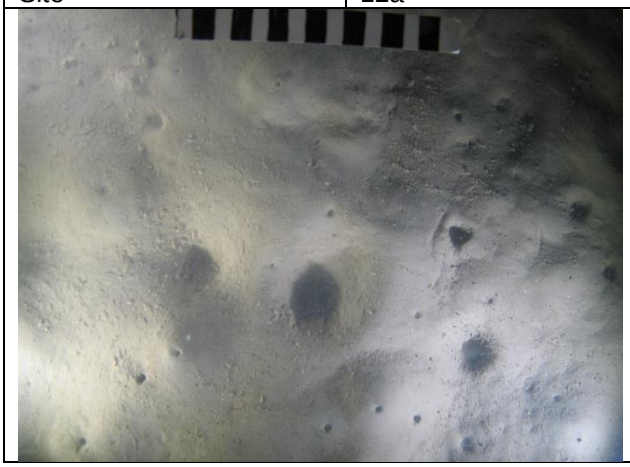
Date	10/06/11
Time	09:44 Hrs
Position	5749.676°N 0301.692°W
Depth (m)	80.1
Description	Very fine sand/mud. Hydroid bottom right. Burrows in sediment.

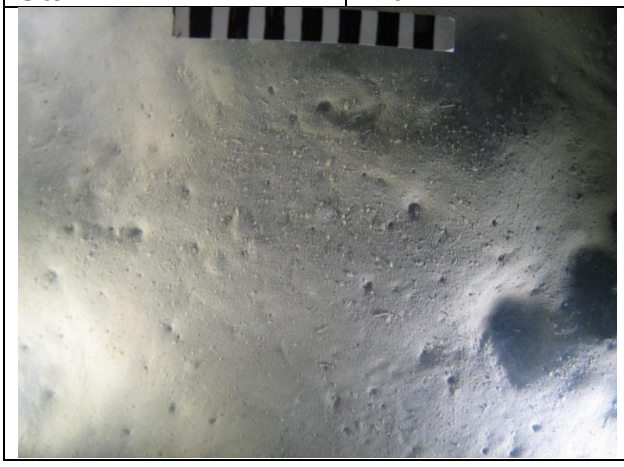
Site	11b

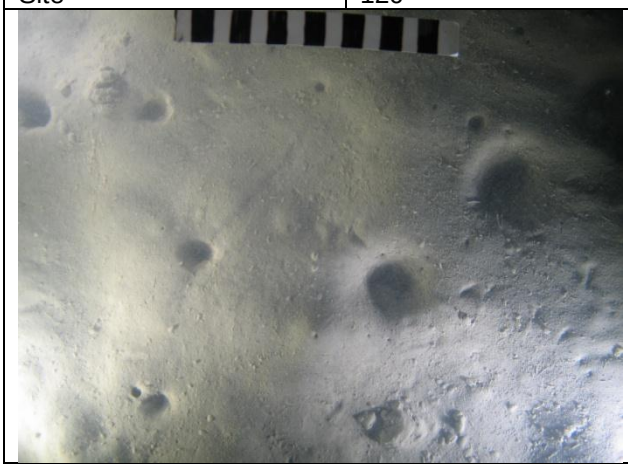


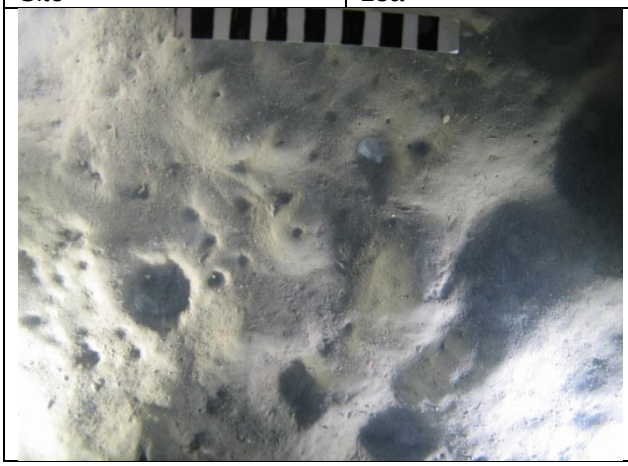
Date	10/06/11
Time	09:45 Hrs
Position	5749.678°N 0301.680°W
Depth (m)	80.3
Description	Very fine sand/mud. Likely Maldanidae worm in centre of image. Burrows in sediment.

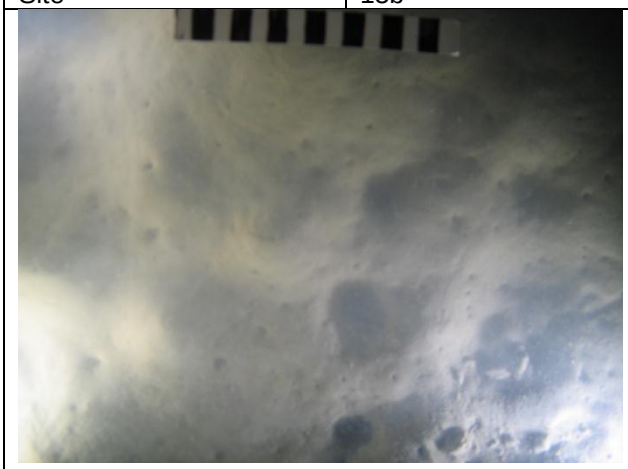
Site	11c	Date	10/06/11
		Time	09:46 Hrs
		Position	5749.681°N 0301.666°W
		Depth (m)	80.1
		Description	Very fine sand/mud. Burrows in sediment.

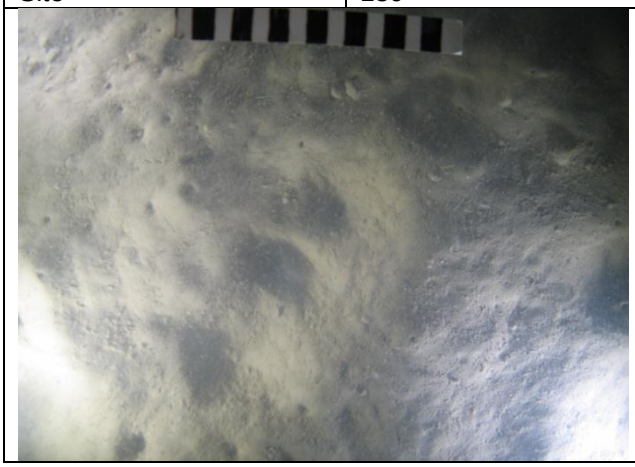
Site	12a	Date	10/06/11
		Time	10:03 Hrs
		Position	5750.773°N 0301.840°W
		Depth (m)	84.5
		Description	Mud Numerous burrows of varying size in sediment. No discernable fauna

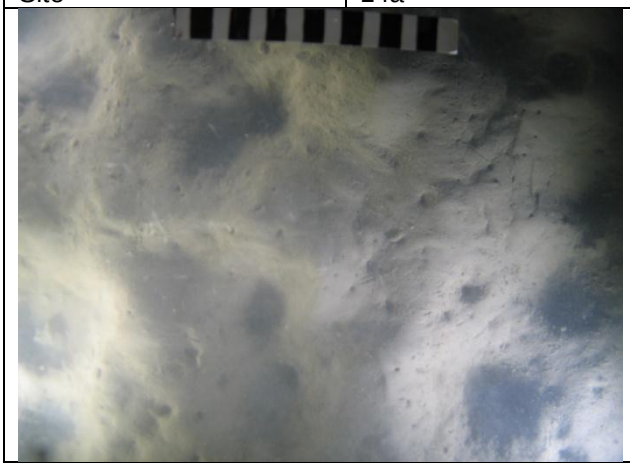
Site	12b	Date	10/06/11
		Time	10:05 Hrs
		Position	5750.776°N 0301.829°W
		Depth (m)	84.9
		Description	Mud Numerous small burrows and some large burrows in sediment. No discernable fauna

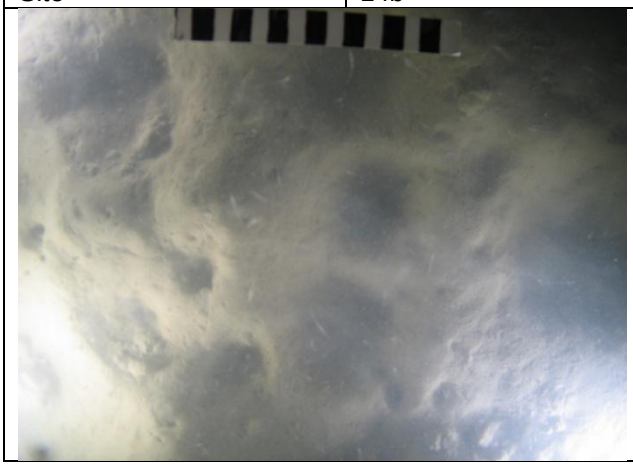
Site	12c	Date	10/06/11
		Time	10:07 Hrs
		Position	5750.780°N 0301.820°W
		Depth (m)	84.5
		Description	Mud Burrows in sediment. Possible hermit crab track centre

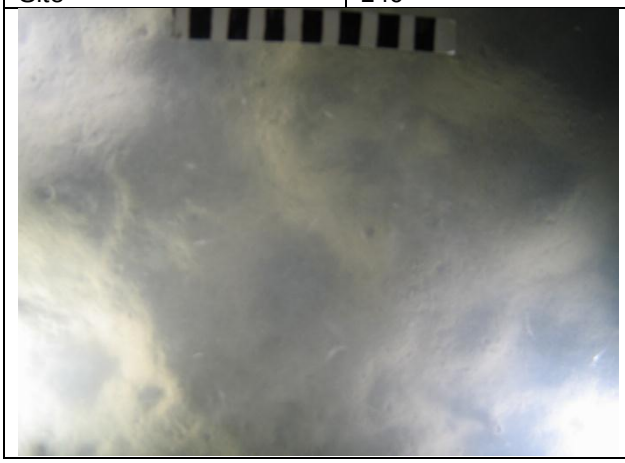
Site	13a	Date	10/06/11
		Time	10:42 Hrs
		Position	5752.115°N 0302.126°W
		Depth (m)	82.3
		Description	Mud Numerous pits and burrows of varying size in sediment. Possible Burrowing anemone below scale bar.

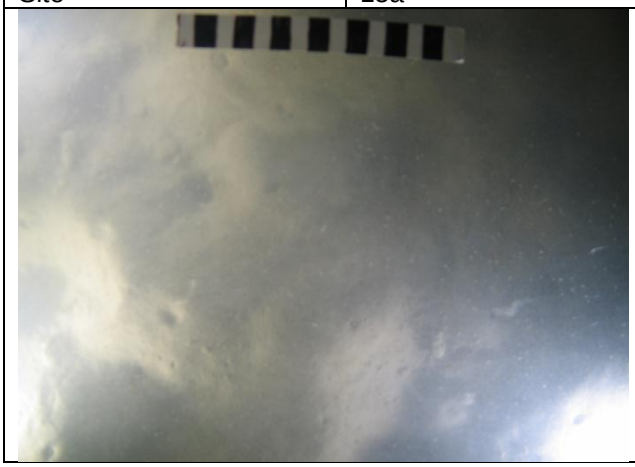
Site	13b	Date	10/06/11
		Time	10:44 Hrs
		Position	5752.115°N 0302.118°W
		Depth (m)	82.2
		Description	Mud (Suspended sediments in field of view). Burrows. No discernable fauna.

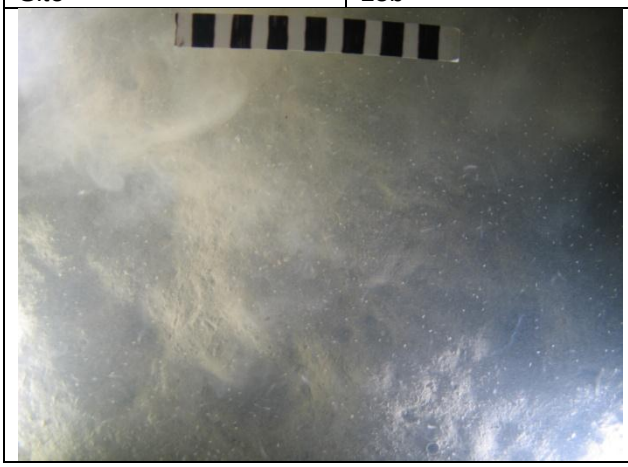
Site	13c	Date	10/06/11
		Time	10:46 Hrs
		Position	5752.122°N 0302.109°W
		Depth (m)	82.1
		Description	Mud Burrows and pits in sediment. No discernable fauna.

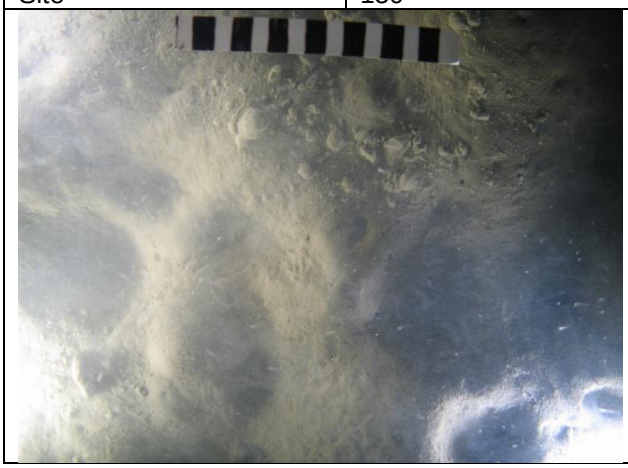
Site	14a	Date	10/06/11
		Time	11:08 Hrs
		Position	5753.529°N 0302.128°W
		Depth (m)	84.8
		Description	Mud (Suspended sediments in field of view). Burrows and pits. No discernable fauna.

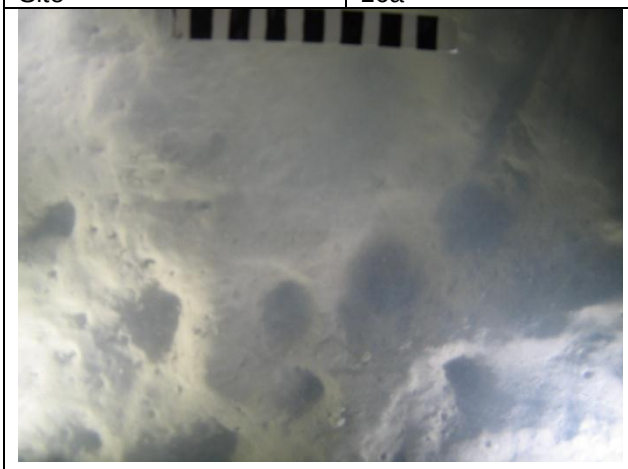
Site	14b	Date	10/06/11
		Time	11:10 Hrs
		Position	5753.527°N 0302.124°W
		Depth (m)	84.9
		Description	Mud (Suspended sediments in field of view). Burrows and pits. No discernable fauna.

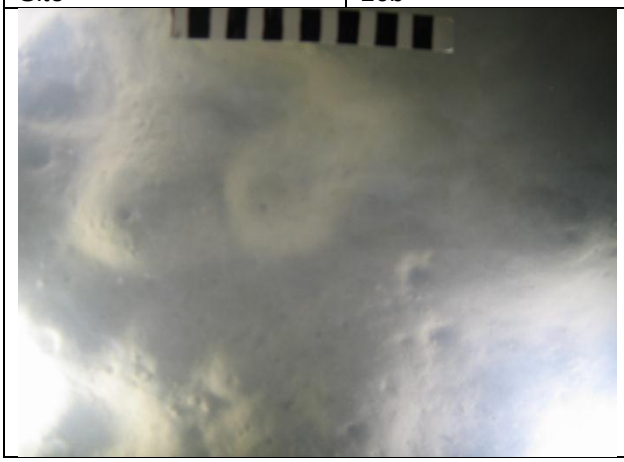
Site	14c	Date	10/06/11
		Time	11:12 Hrs
		Position	5753.529°N 0302.113°W
		Depth (m)	84.7
		Description	Mud (Suspended sediments in field of view). Few small burrows. No discernable fauna.

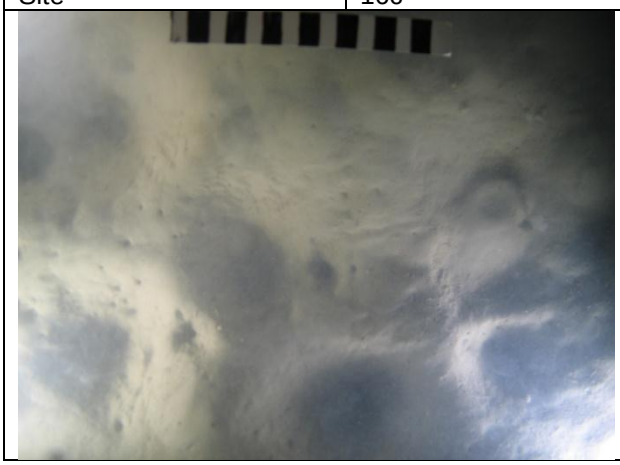
Site	15a	Date	11/06/11
		Time	18:59 Hrs
		Position	5752.450°N 0251.981°W
		Depth (m)	91.7
		Description	Mud (Suspended sediments in field of view). Few small burrows. No discernable fauna.

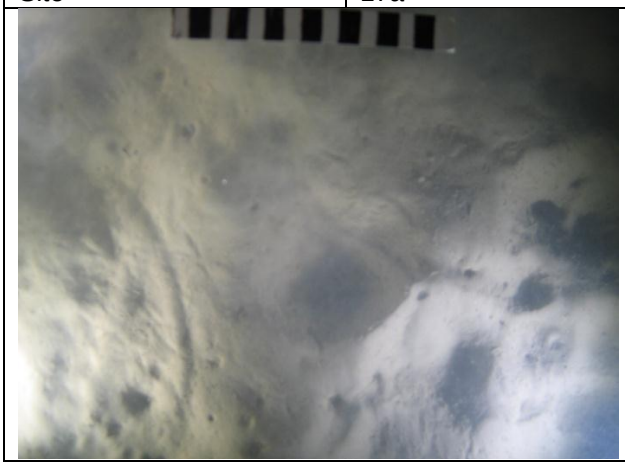
Site	15b	Date	11/06/11
		Time	19:02 Hrs
		Position	5752.427°N 0251.987°W
		Depth (m)	91.7
		Description	Fine sand/mud (Suspended sediments in field of view). Worm tube bottom centre. Possible faunal tracks bottom left.

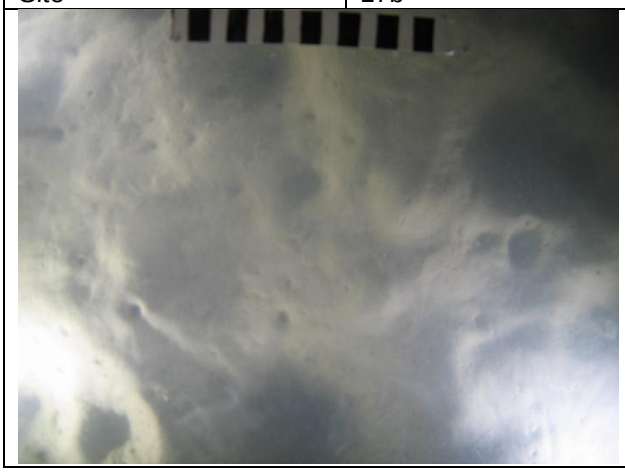
Site	15c	Date	11/06/11
		Time	19:05 Hrs
		Position	5752.414°N 0251.993°W
		Depth (m)	92.1
		Description	Mud. Coarser material with silt veneer or aggregations of mud top centre. No discernible fauna.

Site	16a	Date	10/06/11
		Time	11:49 Hrs
		Position	5754.158°N 0258.928°W
		Depth (m)	86.9
		Description	Mud (Suspended sediments in field of view). Large and small burrows/pits in sediment. No discernible fauna but evidence of bioturbation.

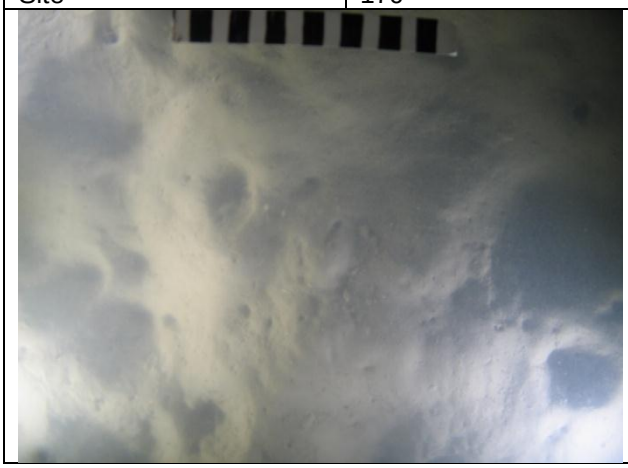
Site	16b	Date	10/06/11
		Time	11:54 Hrs
		Position	5754.163°N 0258.916°W
		Depth (m)	87.0
		Description	Mud (Suspended sediments in field of view). Some small burrows. No discernible fauna.

Site	16c	Date	10/06/11
		Time	11:57 Hrs
		Position	5754.165°N 0258.925°W
		Depth (m)	87.0
		Description	Mud Some small burrows. No discernable fauna.

Site	17a	Date	10/06/11
		Time	12:19 Hrs
		Position	5754.837°N 0302.274°W
		Depth (m)	84.7
		Description	Mud Tubeworm protruding sediment surface middle right. Burrows and pits and tracks in sediment.

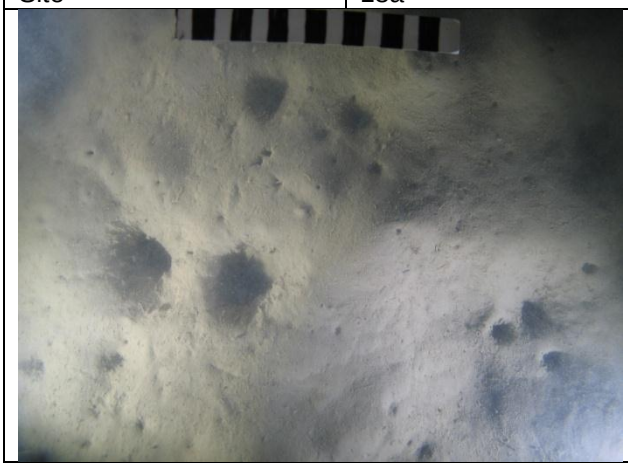
Site	17b	Date	10/06/11
		Time	12:20 Hrs
		Position	5754.842°N 0302.277°W
		Depth (m)	84.4
		Description	Mud (Suspended sediments in field of view). Some small burrows and larger pits in sediment. No discernible epifauna.

Site	17c



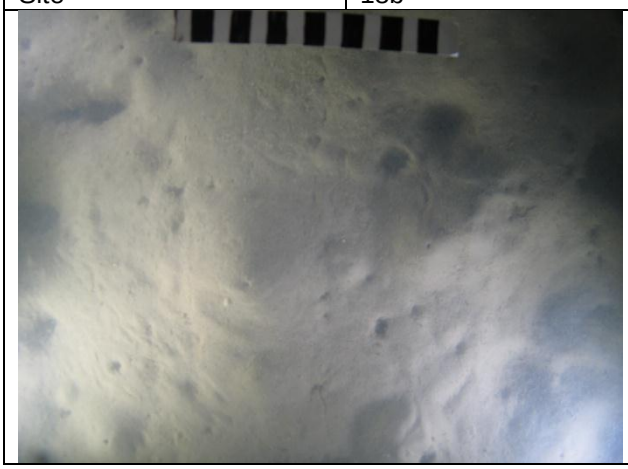
Date	10/06/11
Time	12:23 Hrs
Position	5754.845°N 0302.273°W
Depth (m)	84.3
Description	Mud (Suspended sediments in field of view). Some small burrows and larger pits in sediment. No discernible fauna.

Site	18a

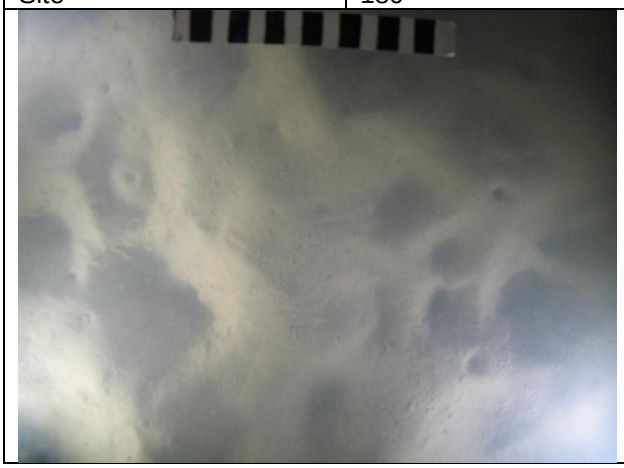


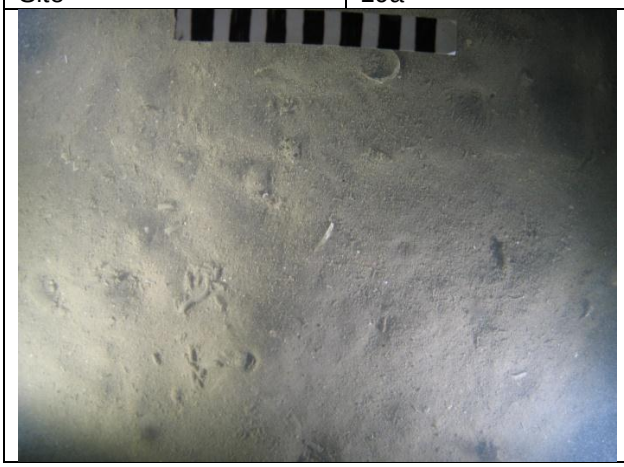
Date	10/06/11
Time	12:40 Hrs
Position	5755.940°N 0302.223°W
Depth (m)	81.7
Description	Mud Large, deep burrows middle left. Other smaller burrows in sediment.

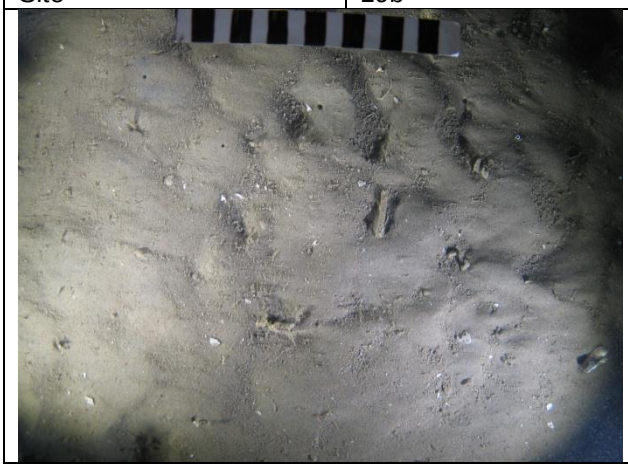
Site	18b



Date	10/06/11
Time	12:42 Hrs
Position	5755.942°N 0302.203°W
Depth (m)	81.6
Description	Mud Burrows and tracks in sediment.

Site	18c	Date	10/06/11
		Time	12:45 Hrs
		Position	5755.933°N 0302.206°W
		Depth (m)	81.6
		Description	Mud Burrows and pits in sediment. No visible epifauna.

Site	19a	Date	10/06/11
		Time	13:32 Hrs
		Position	5757.318°N 0302.443°W
		Depth (m)	56.2
		Description	Very fine sand. Worm casts on sediment surface. Empty bivalve shell below scale bar. No other discernible fauna.

Site	19b	Date	10/06/11
		Time	13:35 Hrs
		Position	5757.310°N 0302.434°W
		Depth (m)	54.4
		Description	Fine sand with ripples. Tubeworms protruding sediment surface. Some hydroids bottom centre and few small burrows below scale bar.

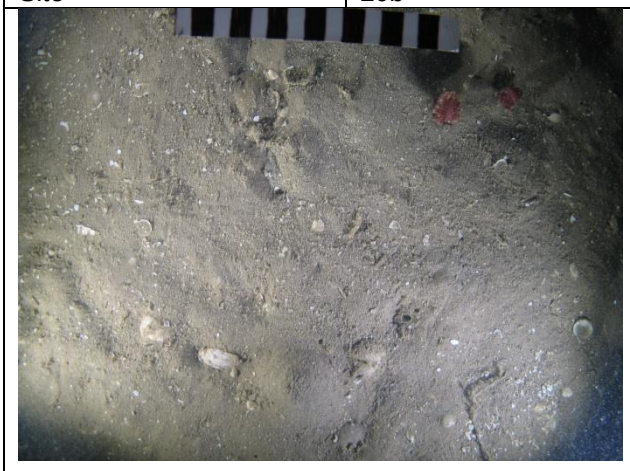
Site	19c

Date	10/06/11
Time	13:37 Hrs
Position	5757.308°N 0302.439°W
Depth (m)	56.3
Description	Fine sand with ripples. Tubeworms protruding sediment surface. Possible burrowing anemone below left of scale bar. Several deceased bivalve shells underlying veneer of sand.

Site	20a

Date	06/06/11
Time	13:12 Hrs
Position	5758.451°N 0302.645°W
Depth (m)	52.9
Description	Very fine sand/mud. Some fine shell fragments and empty bivalve shells underlying. Mass of hydroid below scale bar.

Site	20b

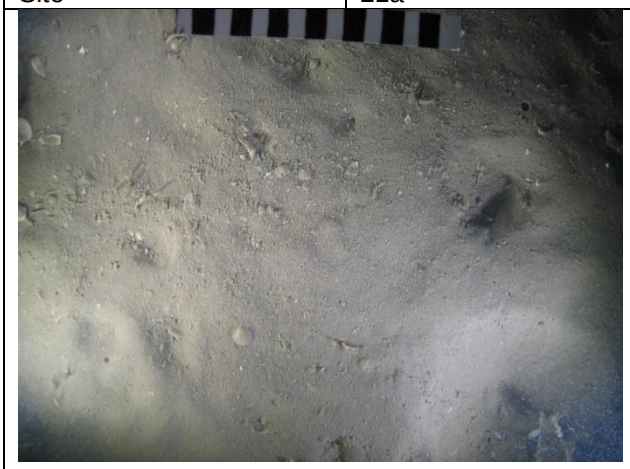


Date	06/06/11
Time	13:14 Hrs
Position	5758.458°N 0302.636°W
Depth (m)	53.5
Description	Fine sand and shell fragments (some large/intact). Sea pen, *Pennatula phosphorea* top right. Possible hydroid below scale bar and bottom right.

Site	20c

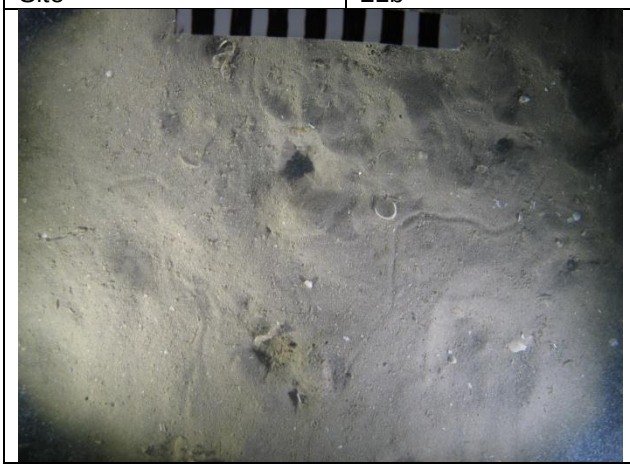
Date	06/06/11
Time	13:17 Hrs
Position	5758.462°N 0302.634°W
Depth (m)	53.1
Description	Fine sand and shell fragments (some large/intact). Protruding tubeworm/mass of hydroid below scale bar. Faunal track centre left.

Site	21a

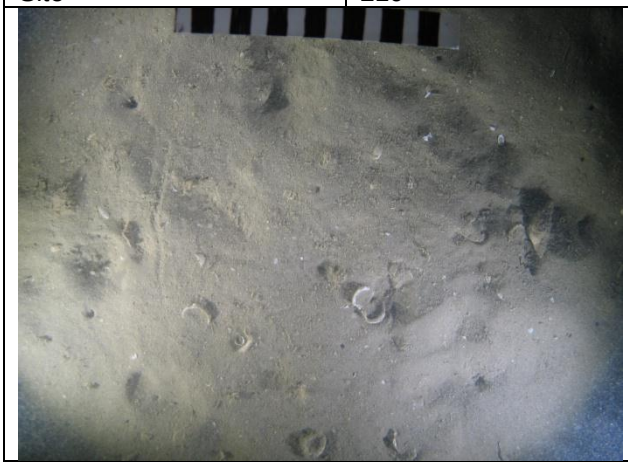


Date	06/06/11
Time	14:12 Hrs
Position	5759.778°N 0302.638°W
Depth (m)	55.6
Description	Very fine sand/mud with few broken shell fragments. Some burrows. Indiscernible object/organism bottom right.

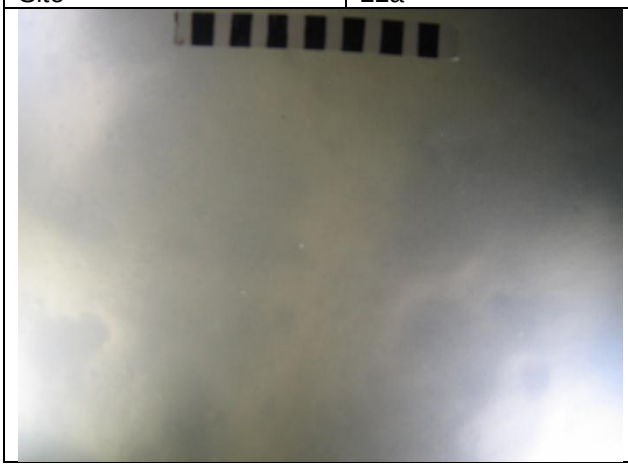
Site	21b



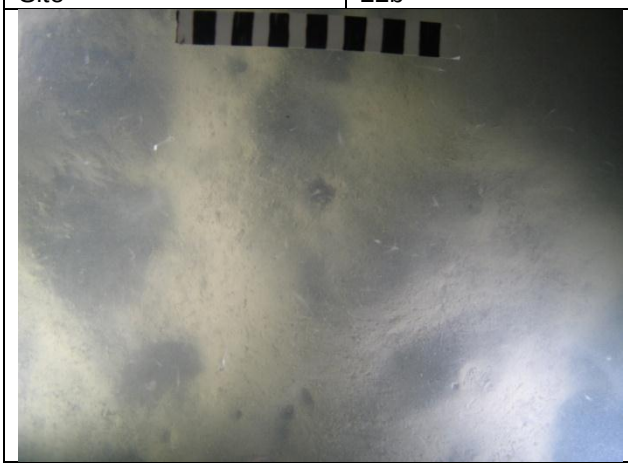
Date	06/06/11
Time	14:15 Hrs
Position	5759.788°N 0302.650°W
Depth (m)	55.7
Description	Very fine sand/mud. Few underlying shell fragments. Faunal tracks and burrows in sediment.

Site	21c
	

Date	06/06/11
Time	14:17 Hrs
Position	5759.781°N 0302.638°W
Depth (m)	55.6
Description	Very fine sand/mud. Few underlying shell fragments. Faunal tracks and burrows in sediment.

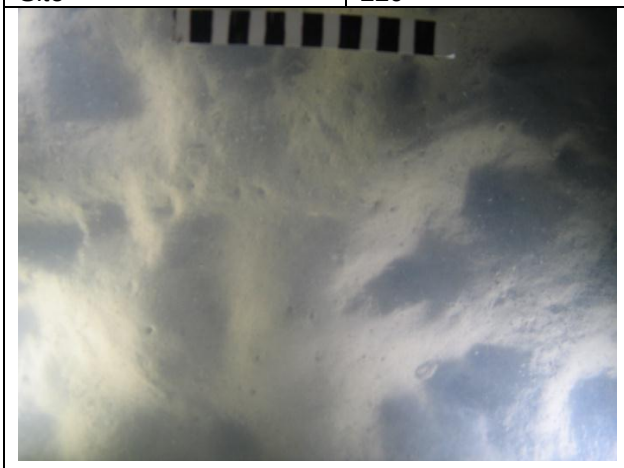
Site	22a
	

Date	11/06/11
Time	17:58 Hrs
Position	5757.429°N 0253.462°W
Depth (m)	79.7
Description	High level of suspended sediment in field of view. Habitat likely mud with burrows.

Site	22b
	

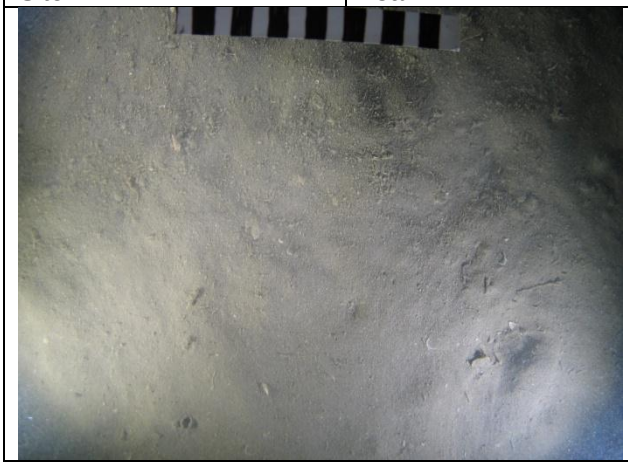
Date	11/06/11
Time	18:01 Hrs
Position	5757.415°N 0253.472°W
Depth (m)	79.6
Description	Mud (Suspended sediments in field of view). Burrows and depressions in sediment. No discernable fauna.

Site	22c



Date	11/06/11
Time	18:02 Hrs
Position	5757.416°N 0253.480°W
Depth (m)	79.8
Description	Mud (Suspended sediments in field of view). Burrows and depressions in sediment. Possible tubeworm bottom right.

Site	23a

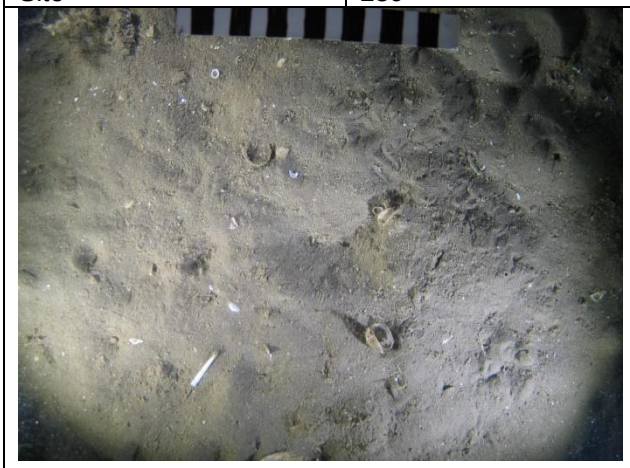


Date	06/06/11
Time	13:41 Hrs
Position	5759.313°N 0259.01°W
Depth (m)	55.9
Description	Very fine sand/mud. No discernable fauna.

Site	23b

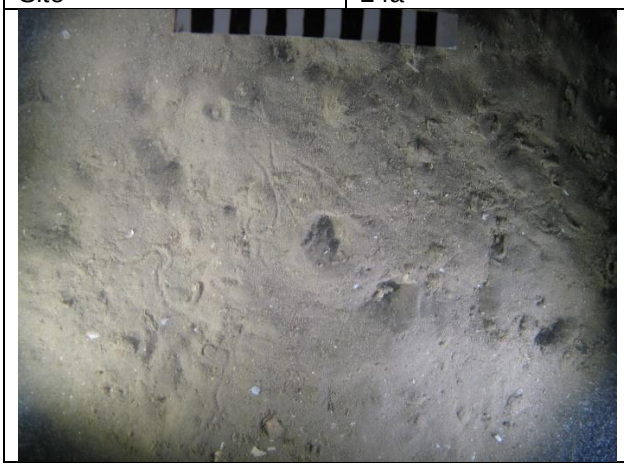
Date	06/06/11
Time	13:45 Hrs
Position	5759.314°N 0259.320°W
Depth (m)	55.9
Description	Fine sand and some shell fragments (some whole/intact). Tubeworm protruding from sediment surface below scale bar. Faunal tracks. Possible small amount of bryozoa middle right.

Site	23c



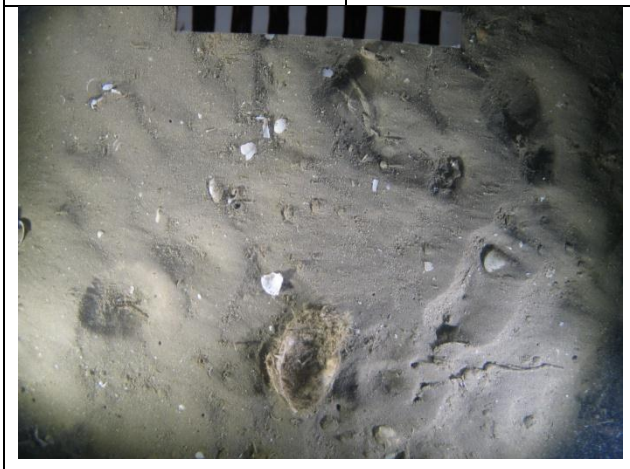
Date	06/06/11
Time	13:47 Hrs
Position	5759.321°N 0259.322°W
Depth (m)	55.9
Description	Fine sand and some shell fragments (some whole/intact). Mass of hydroid/bryozoa top left of scale bar. Fragments of worm tubes and faunal tracks/pits top right.

Site	24a

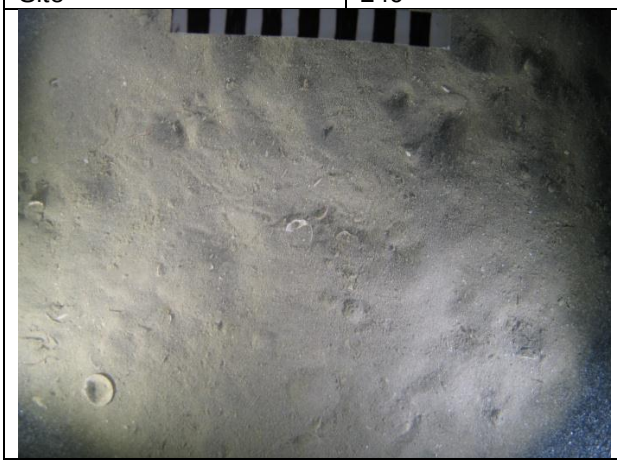


Date	06/06/11
Time	14:43 Hrs
Position	5800.996°N 0302.860°W
Depth (m)	49.9
Description	Very fine sand/mud. Aggregation of tubeworms middle right and individual tubes top right. Faunal tracks and burrows.

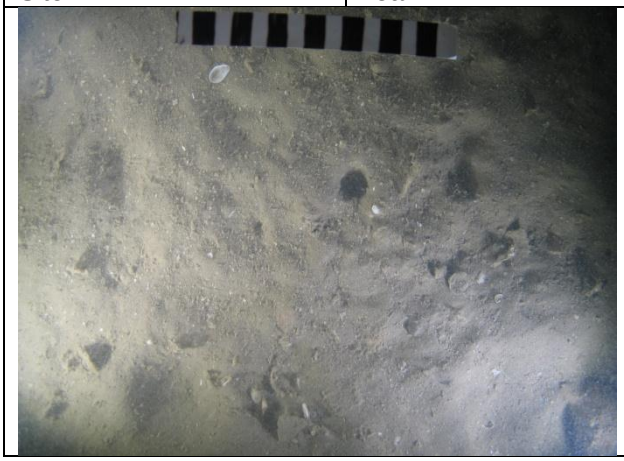
Site	24b



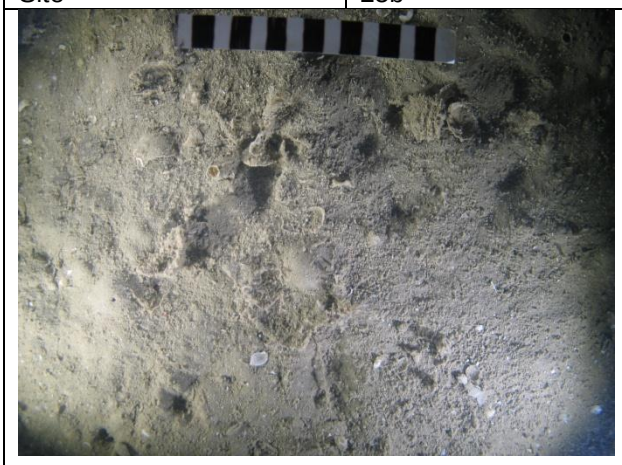
Date	06/06/11
Time	14:45 Hrs
Position	5800.970°N 0302.870°W
Depth (m)	52.7
Description	Very fine sand and few shell fragments with ripples. Possible *Lanice conchilega* below scale bar. Empty bivalve shell covered in organic matter/weed. Burrows.

Site	24c
	

Date	06/06/11
Time	14:48 Hrs
Position	5800.964°N 0302.874°W
Depth (m)	52.9
Description	Very fine sand/mud. Burrows, pits and faunal tracks. No discernible fauna.

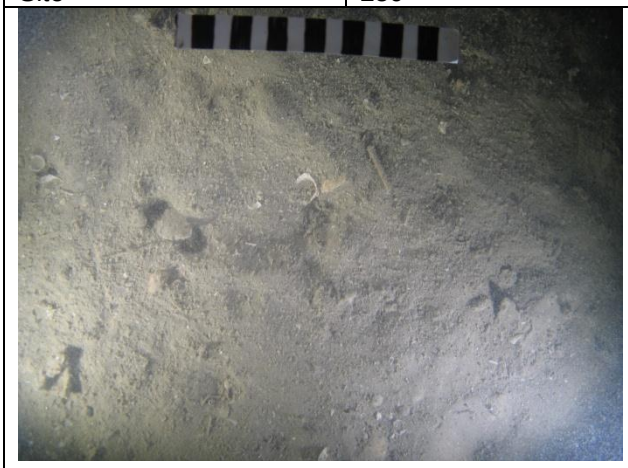
Site	25a
	

Date	11/06/11
Time	17:01 Hrs
Position	5801.924°N 0254.579°W
Depth (m)	52.5
Description	Very fine sand/mud. Worm tubes and burrows in places.

Site	25b
	

Date	11/06/11
Time	17:05 Hrs
Position	5801.921°N 0254.566°W
Depth (m)	52.7
Description	Very fine sand/mud. Patches of hydroid/bryozoa covering shells. Tubeworm protruding from sediment surface centre and top right.

Site	25c

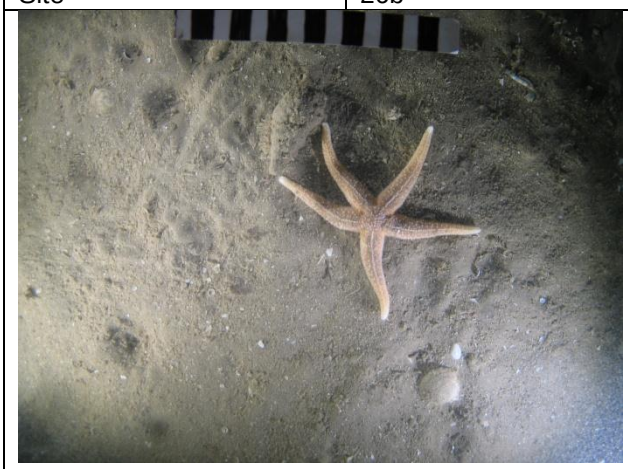


Date	11/06/11
Time	17:07 Hrs
Position	5801.911°N 0254.581°W
Depth (m)	52.6
Description	Very fine sand/mud with appearance of bioturbation. Worm tube on sediment surface below scale bar. Possible *Lanice conchilega* middle left.

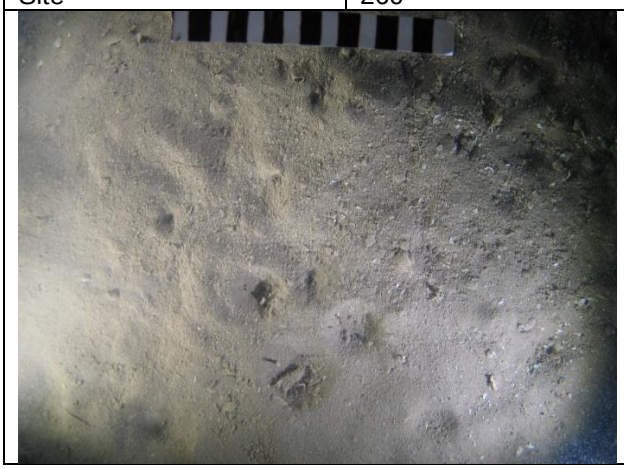
Site	26a

Date	10/06/11
Time	14:28 Hrs
Position	5802.461°N 0303.029°W
Depth (m)	48.4
Description	Very fine sand and small amount of shell with small depressions (not rippled). No discernable fauna

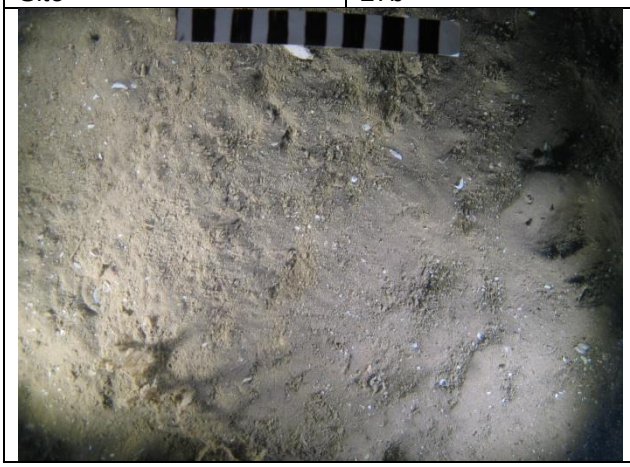
Site	26b



Date	10/06/11
Time	14:30 Hrs
Position	5802.459°N 0303.046°W
Depth (m)	48.2
Description	Fine sand with shell fragments and dead bivalve shells. *Asterias rubens* and possible whelk with bryozoan growth on shell. *Lagis conchilega* present in sand.

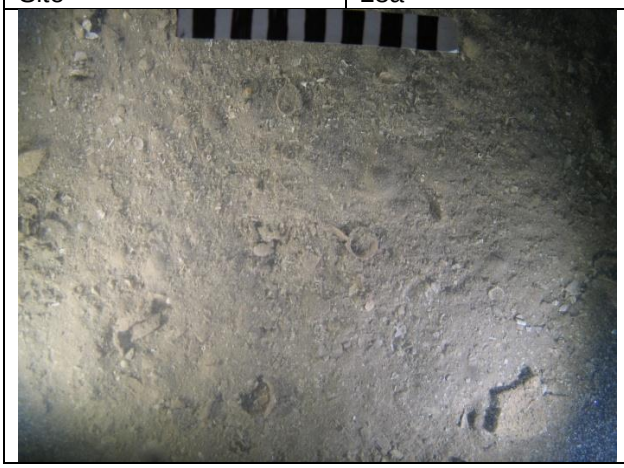
Site	26c	Date	10/06/11
		Time	14:31 Hrs
		Position	5802.462°N 0303.054°W
		Depth (m)	48.5
		Description	Very fine sand/mud. Small amount of fine shell fragments. Protruding small tubeworm bottom centre. Burrows.

Site	27a	Date	10/06/11
		Time	14:57 Hrs
		Position	5803.813°N 0303.033°W
		Depth (m)	46.2
		Description	Very fine sand/mud. Small amount of fine shell fragments. No discernible fauna.

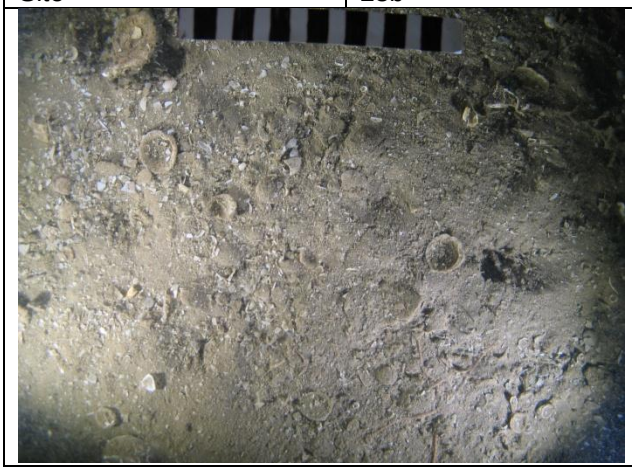
Site	27b	Date	10/06/11
		Time	14:58 Hrs
		Position	5803.809°N 0303.054°W
		Depth (m)	45.8
		Description	Fine sand with shell fragments. Hydroids and burrows.

Site	27c
	

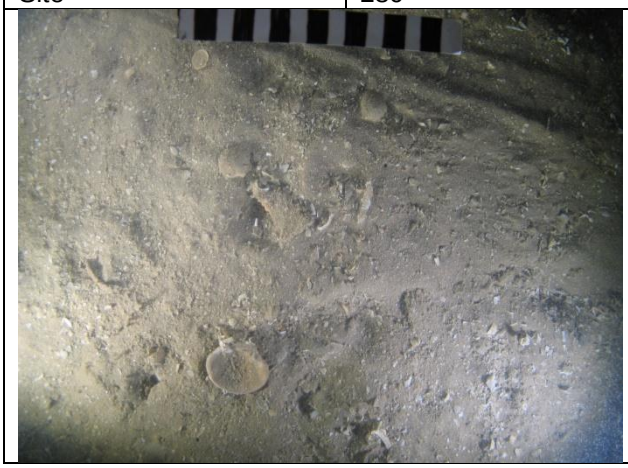
Date	10/06/11
Time	15:00 Hrs
Position	5803.810°N 0303.063°W
Depth (m)	46.1
Description	Fine sand and shell with small amount of shell fragments. Empty *Ensis sp.* shells. Hydroid/bryozoa below scale bar and worm casts centre.

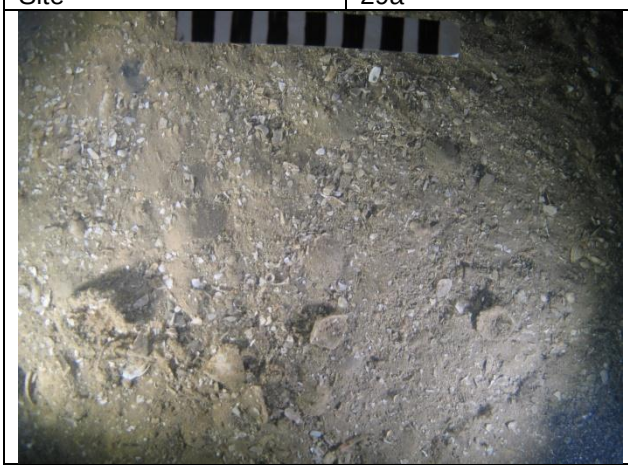
Site	28a
	

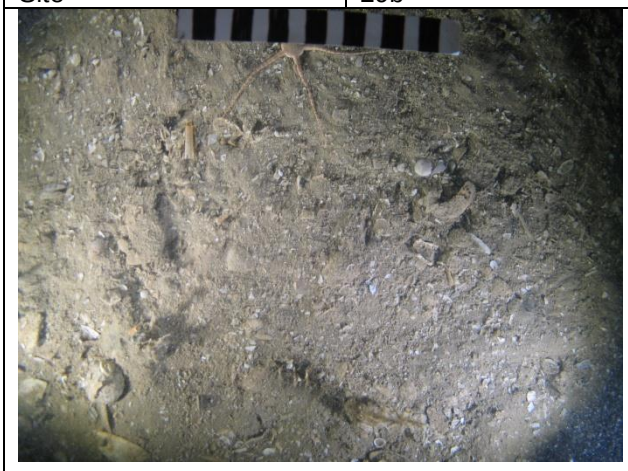
Date	10/06/11
Time	15:18 Hrs
Position	5805.019°N 0302.954°W
Depth (m)	43.3
Description	Very fine sand/mud and shell fragments (some whole). No discernible fauna.

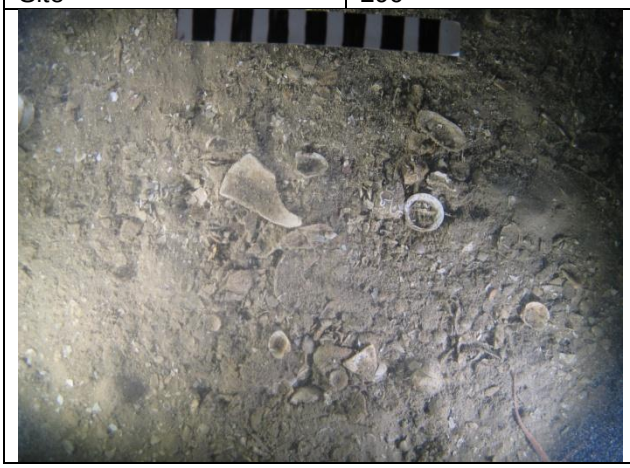
Site	28b
	

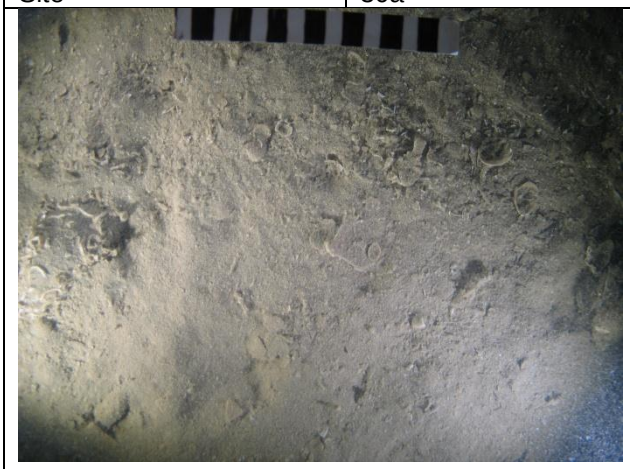
Date	10/06/11
Time	15:20 Hrs
Position	5805.019°N 0302.958°W
Depth (m)	43.4
Description	Very shelly sand. Two brittlestars (*Ophiura sp.*) bottom right. Hydroid top right. Bryozoa on empty shell top left.

Site	28c	Date	10/06/11
		Time	15:21 Hrs
		Position	5805.020°N 0302.969°W
		Depth (m)	43.6
		Description	Fine sand and shell. Some small tubeworms.

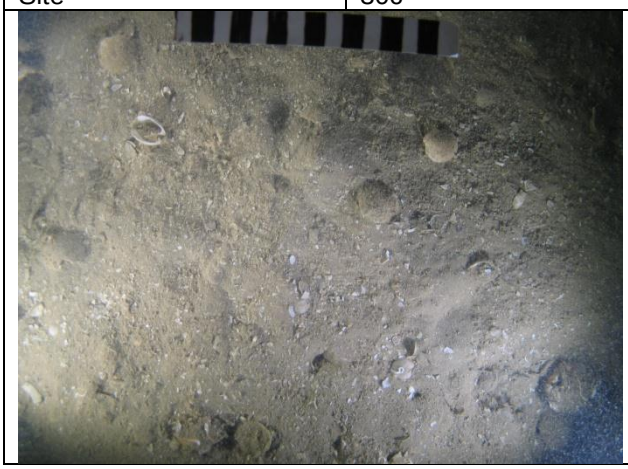
Site	29a	Date	11/06/11
		Time	11:43 Hrs
		Position	5802.323°N 0302.571°W
		Depth (m)	42.4
		Description	Very shelly fine sand Small amount of hydroid bottom right.

Site	29b	Date	11/06/11
		Time	11:44 Hrs
		Position	5802.322°N 0302.577°W
		Depth (m)	41.4
		Description	Very shelly fine sand/mud. Brittlestar (*Ophiura ophiura*) below scale bar. Empty *Pectinaria sp.* shell. Hydroid/bryozoa bottom.

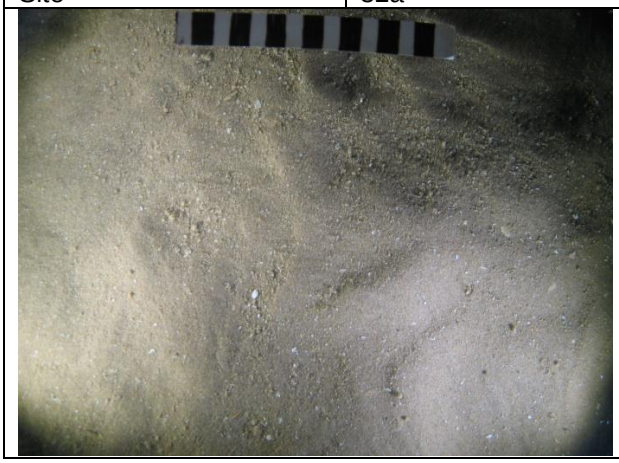
Site	29c	Date	11/06/11
		Time	11:46 Hrs
		Position	5802.322°N 0302.588°W
		Depth (m)	42.5
		Description	Very shelly fine sand/mud. Brittlestars, *Ophiura sp.* *Pomatoceros triqueter* encrusting empty bivalve shell.

Site	30a	Date	11/06/11
		Time	12:07 Hrs
		Position	5806.018°N 0259.761°W
		Depth (m)	45.3
		Description	Very shelly fine sand/mud. Single *Pomatoceros triqueter* encrusted cobble left centre. No other discernible fauna.

Site	30b	Date	11/06/11
		Time	12:10 Hrs
		Position	5806.012°N 0259.768°W
		Depth (m)	45.1
		Description	Very shelly fine sand. *Pomatoceros triqueter* encrusting empty bivalve shells. Hydroid/bryozoa in clumps attached to shells left and right.

Site	30c
	

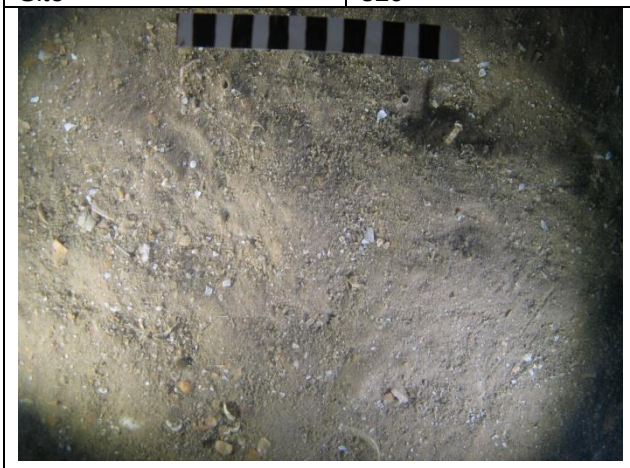
Date	11/06/11
Time	12:12 Hrs
Position	5806.012°N 0259.790°W
Depth (m)	45.3
Description	Very shelly fine sand. *Pomatoceros triqueter* encrusting some empty bivalve shells bottom right.

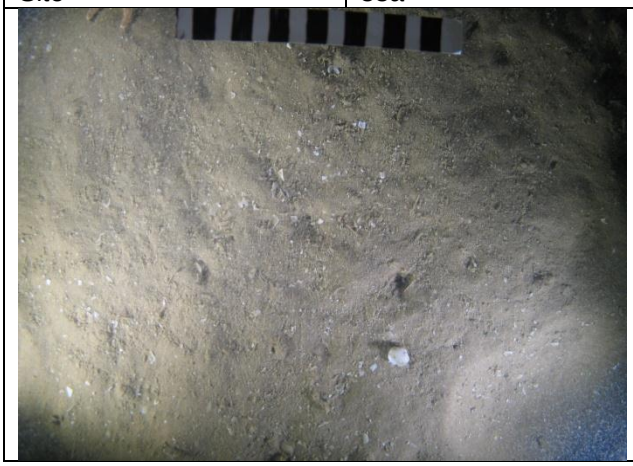
Site	32a
	

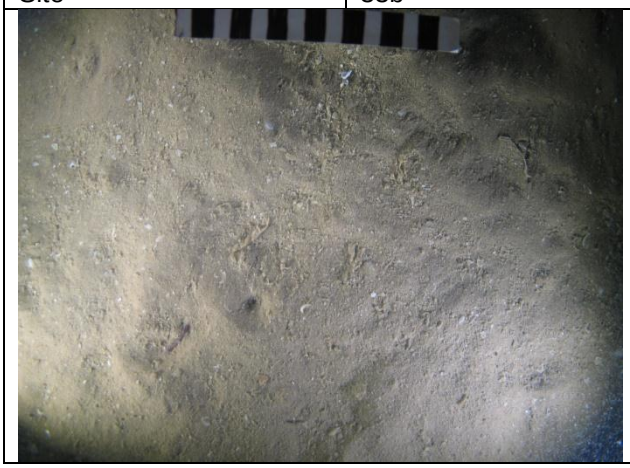
Date	11/06/11
Time	16:00 Hrs
Position	5807.777°N 0251.652°W
Depth (m)	38.9
Description	Medium sand with few shell fragments. No discernible fauna, tracks or burrows.

Site	32b
	

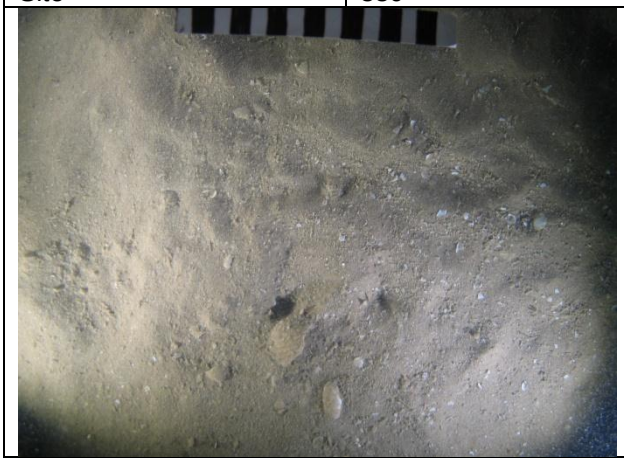
Date	11/06/11
Time	16:02 Hrs
Position	5807.773°N 0251.663°W
Depth (m)	38.8
Description	Medium sand and very fine shell fragments. *Lanice conchilega* tube on sediment surface. Single burrow. No other discernible fauna.

Site	32c	Date	11/06/11
		Time	16:03 Hrs
		Position	5807.773°N 0251.686°W
		Depth (m)	38.9
		Description	Medium/fine sand and shell fragments. *Lanice conchilega* and other tubeworm protruding sediment surface bottom right of scale bar. Possible faunal track bottom right.

Site	33a	Date	11/06/11
		Time	12:32 Hrs
		Position	5807.428°N 0301.564°W
		Depth (m)	43.3
		Description	Fine sand and very fine shell fragments. *Asterias rubens* (part of) top left. Possible *Lanice conchilega* below scale bar.

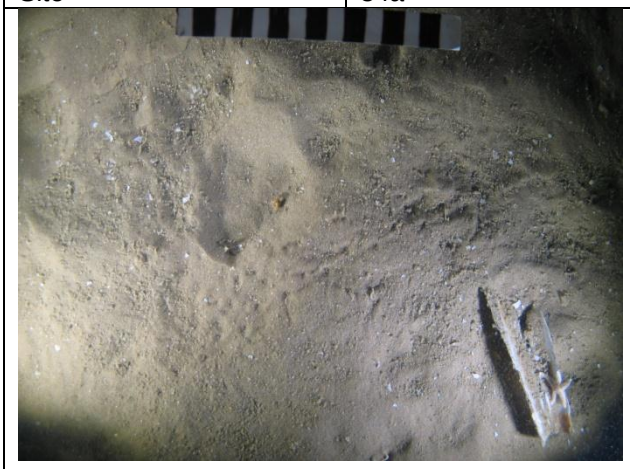
Site	33b	Date	11/06/11
		Time	12:33 Hrs
		Position	5807.423°N 0301.560°W
		Depth (m)	43.8
		Description	Very fine sand/mud. Possible worm tube on sediment surface centre. No discernable fauna.

Site	33c



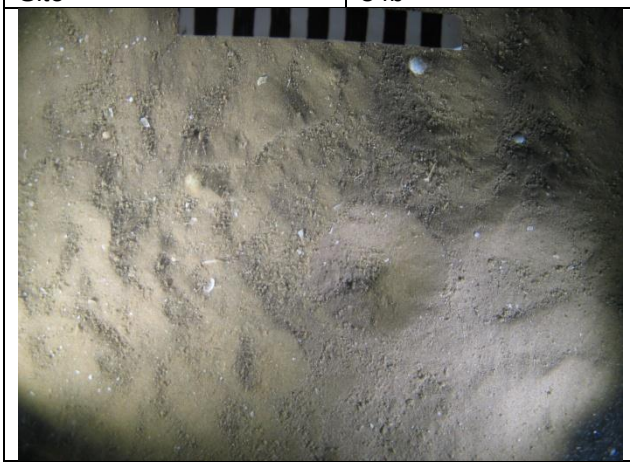
Date	11/06/11
Time	12:34 Hrs
Position	5807.436°N 0301.569°W
Depth (m)	43.7
Description	Very fine sand/mud No discernible fauna.

Site	34a

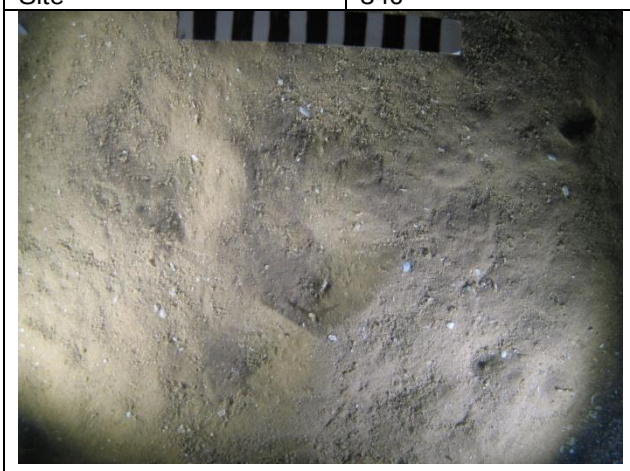


Date	11/06/11
Time	12:51 Hrs
Position	5808.412°N 0300.520°W
Depth (m)	40.5
Description	Medium/fine sand and some very fine shell fragments. Asterias rubens in empty *Ensis sp.* shell. Faunal tracks and small depressions (tracks possibly from a hermit crab).

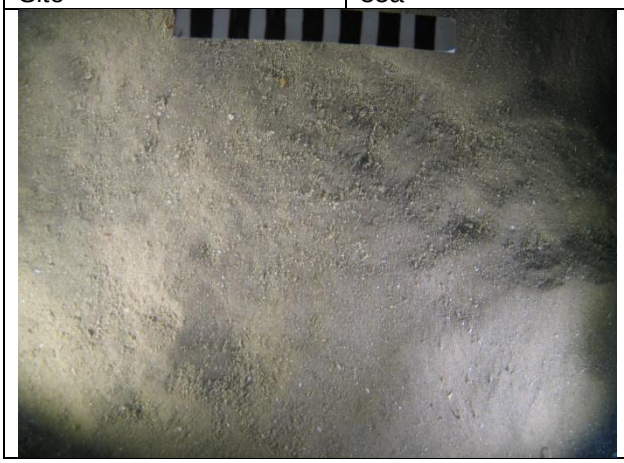
Site	34b



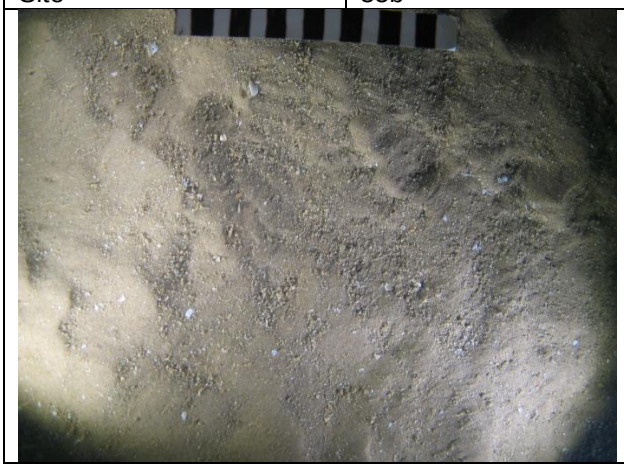
Date	11/06/11
Time	12:53 Hrs
Position	5808.416°N 0300.527°W
Depth (m)	40.7
Description	Medium/fine sand with depressions. Empty worm tube on sediment surface. No discernible fauna.

Site	34c
	

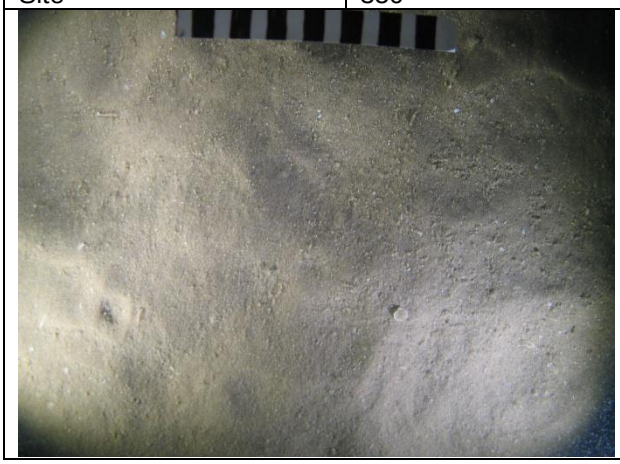
Date	11/06/11
Time	12:54 Hrs
Position	5808.421°N 0300.530°W
Depth (m)	40.5
Description	Medium/fine sand Detached hydroid centre. Single tubeworm protruding sediment surface centre and possible burrow top right.

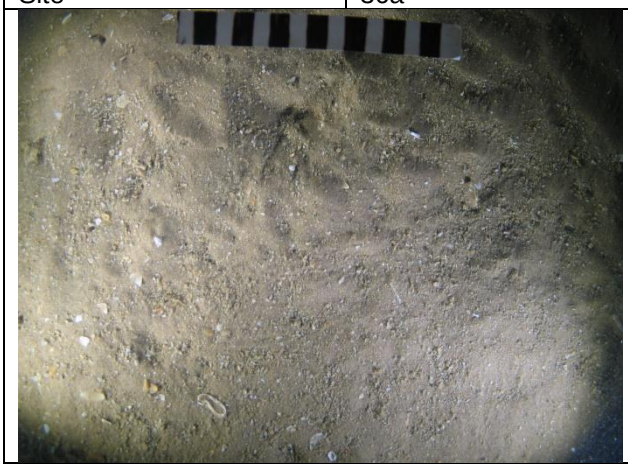
Site	35a
	

Date	11/06/11
Time	13:39 Hrs
Position	5809.517°N 0258.999°W
Depth (m)	34.6
Description	Medium sand. No discernible fauna.

Site	35b
	

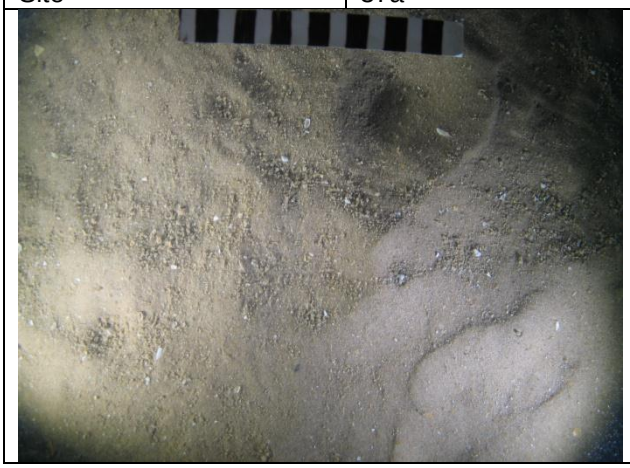
Date	11/06/11
Time	13:42 Hrs
Position	5809.515°N 0259.022°W
Depth (m)	34.9
Description	Medium sand and small amount of very fine shell fragments. No discernible fauna.

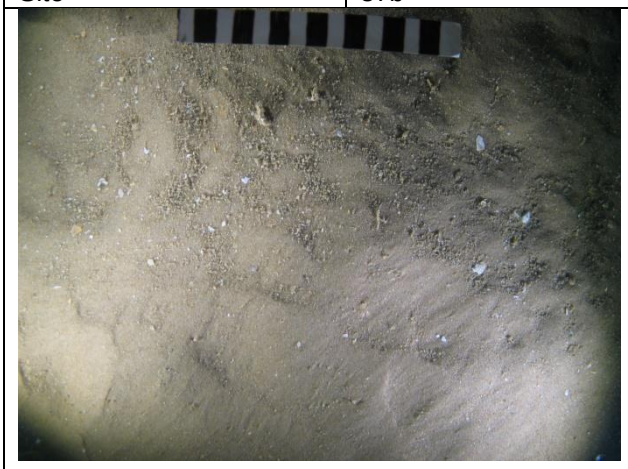
Site	35c	Date	11/06/11
		Time	13:44 Hrs
		Position	5809.523°N 0259.042°W
		Depth (m)	34.6
		Substratum	Medium/fine sand. No discernible fauna.

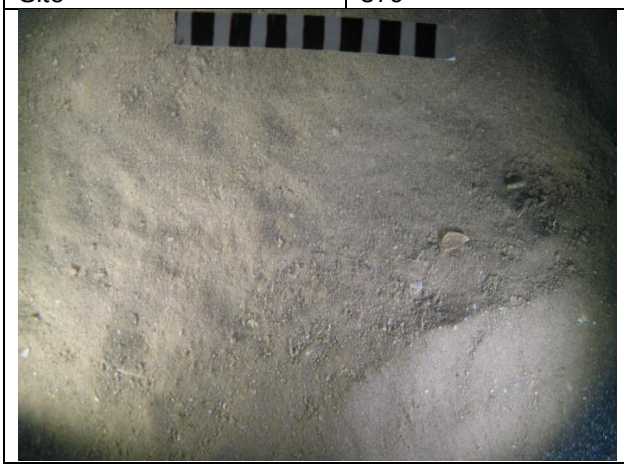
Site	36a	Date	11/06/11
		Time	15:18 Hrs
		Position	5809.861°N 0257.224°W
		Depth (m)	34.6
		Description	Medium sand and fine shell fragments. No discernible fauna

Site	36b	Date	11/06/11
		Time	15:19 Hrs
		Position	5809.862°N 0257.239°W
		Depth (m)	34.9
		Description	Medium sand, fine shell fragments and coarse gravel/pebble. Hydroid, *Plumularia setacea*.

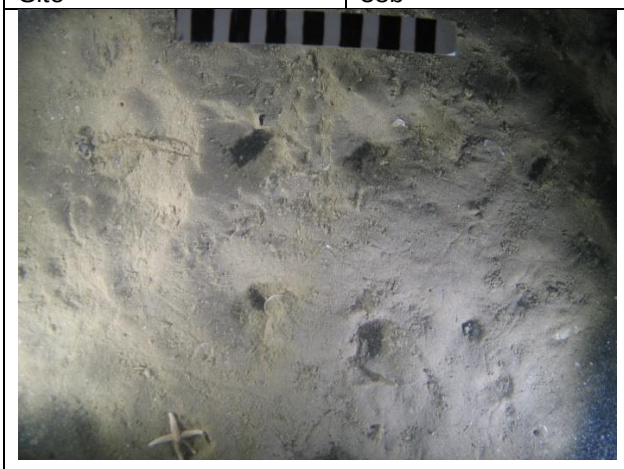
Site	36c	Date	11/06/11
		Time	15:21 Hrs
		Position	5809.863°N 0257.244°W
		Depth (m)	34.6
		Description	Medium sand and fine shell fragments. No discernible fauna.

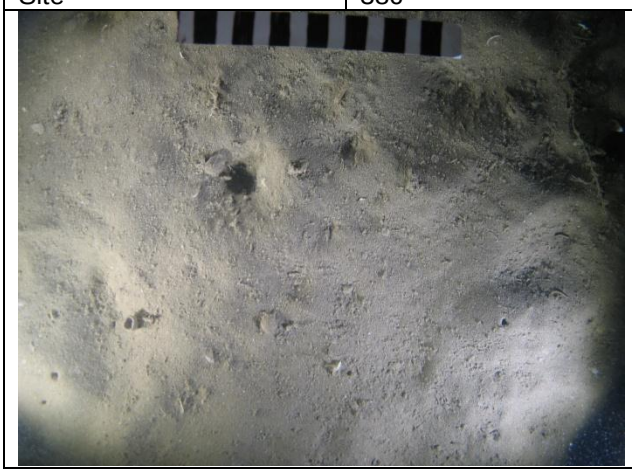
Site	37a	Date	11/06/11
		Time	14:59 Hrs
		Position	5810.621°N 0258.346°W
		Depth (m)	34.3
		Description	Medium sand and fine shell fragments with ripples. No discernible fauna.

Site	37b	Date	11/06/11
		Time	15:00 Hrs
		Position	5810.626°N 0258.352°W
		Depth (m)	35.1
		Description	Medium sand and fine shell fragments with ripples. Possible fragments of worm tube below scale bar. No other discernible fauna.

Site	37c	Date	11/06/11
		Time	15:02 Hrs
		Position	5810.622°N 0258.368°W
		Depth (m)	34.9
		Description	Fine sand. Fragments of worm tube. No other discernible fauna.

Site	38a	Date	11/06/11
		Time	13:38 Hrs
		Position	5809.627°N 0304.396°W
		Depth (m)	50.5
		Description	Very fine sand/Mud. Burrows and possible faunal track centre right. No discernible fauna.

Site	38b	Date	11/06/11
		Time	13:39 Hrs
		Position	5809.633°N 0304.395°W
		Depth (m)	50.6
		Description	Very fine sand/mud. *Asterias rubens* at bottom of image. Tubeworms protruding from sediment surface. Burrows and depressions.

Site	38c
	

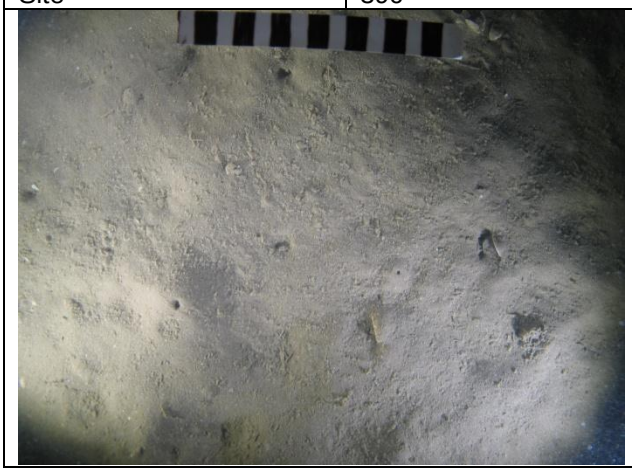
Date	11/06/11
Time	13:41 Hrs
Position	5809.640°N 0304.404°W
Depth (m)	50.7
Description	Very fine sand/mud. Tubeworms and burrows bottom left. Possible hydroid top right.

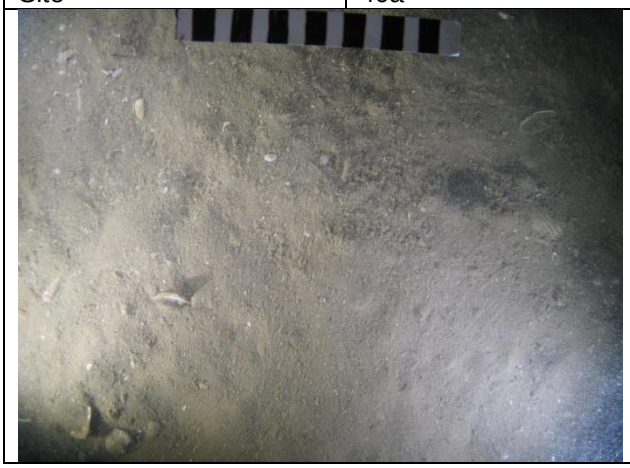
Site	39a
	

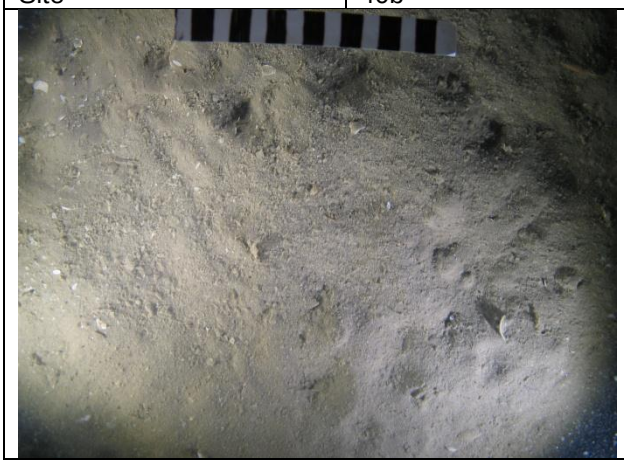
Date	10/06/11
Time	16:06 Hrs
Position	5806.746°N 0306.915°W
Depth (m)	48.0
Description	Very fine sand/mud. Burrows and bioturbation. No discernable fauna.

Site	39b
	

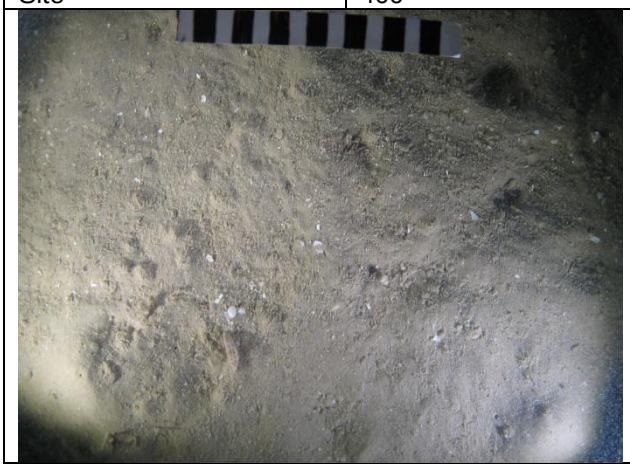
Date	10/06/11
Time	16:08 Hrs
Position	5806.747°N 0306.904°W
Depth (m)	45.7
Description	Very fine sand/mud. Possible tubeworm below scale bar. Burrows

Site	39c	Date	10/06/11
		Time	16:10 Hrs
		Position	5806.743°N 0306.921°W
		Depth (m)	48.1
		Description	Very fine sand/mud. Tubeworm (probably *Lanice conchilega*) middle and worm casts bottom right. Burrows.

Site	40a	Date	10/06/11
		Time	16:50 Hrs
		Position	5802.741°N 0305.756°W
		Depth (m)	47.6
		Description	Very fine sand/mud. Possible needle whelk/tower shell middle left.

Site	40b	Date	10/06/11
		Time	16:52 Hrs
		Position	5802.734°N 0305.770°W
		Depth (m)	47.4
		Description	Very fine sand/mud with broken shell. Small piece of hydroid bottom right by shell. Burrows.

Site	40c

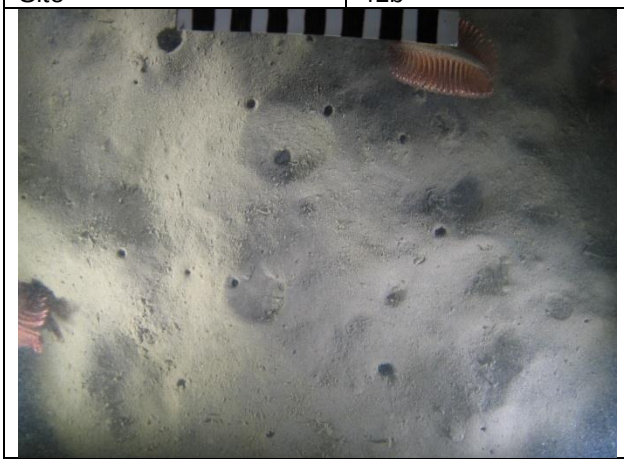


Date	10/06/11
Time	16:54 Hrs
Position	5802.742°N 0305.777°W
Depth (m)	47.8
Description	Very fine sand/mud. Single burrow top right. No other discernible fauna.

Site	41a

Date	06/06/11
Time	16:28 Hrs
Position	5802.762°N 0322.320°W
Depth (m)	52.0
Description	Mud (Suspended sediment in field of view). Tubeworm protruding sediment surface middle right. Clump of material in centre – unknown. Hydroid/bryozoa middle left. Burrows.

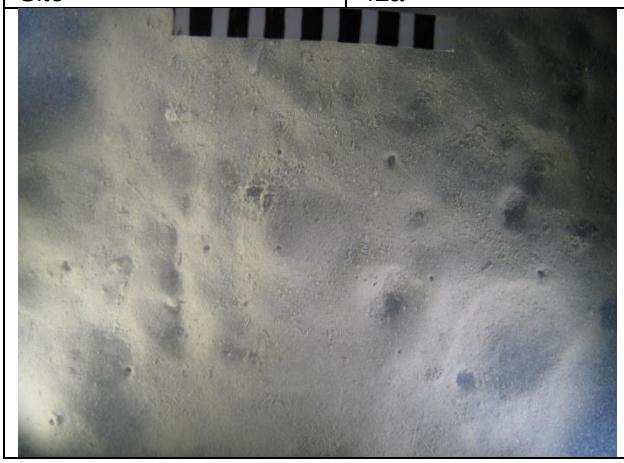
Site	41b



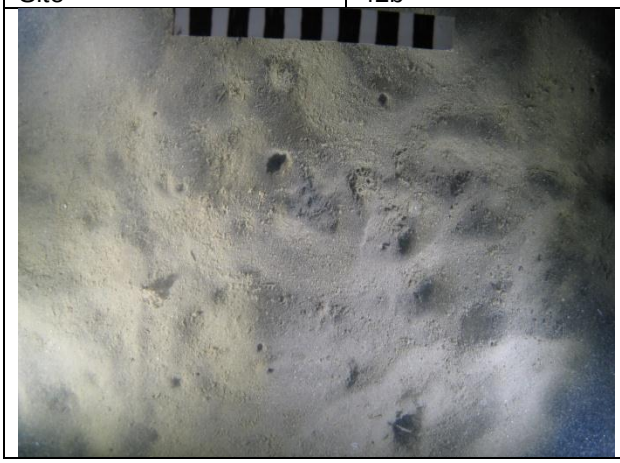
Date	06/06/11
Time	16:33 Hrs
Position	5802.788°N 0322.349°W
Depth (m)	51.3
Description	Mud. Sea pens, *Pennatula phosphorea*. Burrows.

Site	41c
	

Date	06/06/11
Time	16:35 Hrs
Position	5802.784°N 0322.328°W
Depth (m)	51.7
Description	Very fine sand/mud with ripples and depressions. Some organic debris. Tubeworms and burrows.

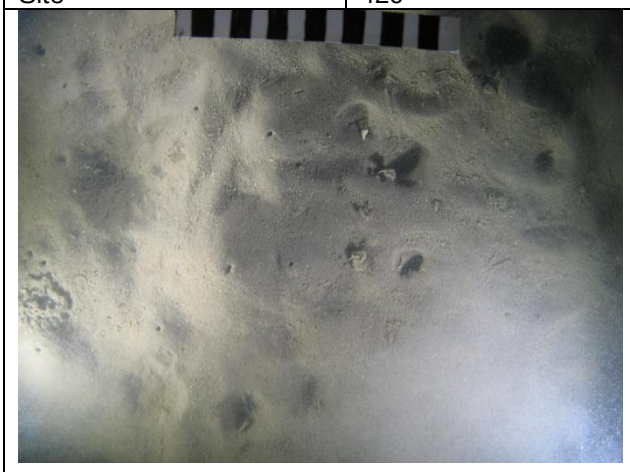
Site	42a
	

Date	06/06/11
Time	17:58 Hrs
Position	5757.170°N 0317.753°W
Depth (m)	51.3
Description	Mud. Burrows. No discernible fauna.

Site	42b
	

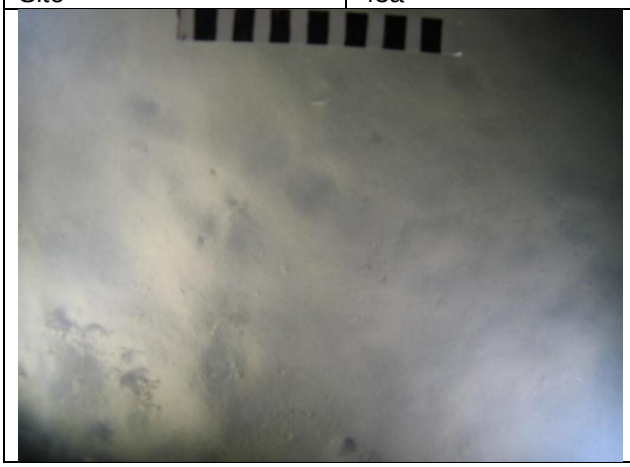
Date	06/06/11
Time	18:00 Hrs
Position	5757.165°N 0317.753°W
Depth (m)	51.6
Description	Mud. Small mass of bryozoa left middle. Possible worm cast below scale bar. Burrows.

Site	42c



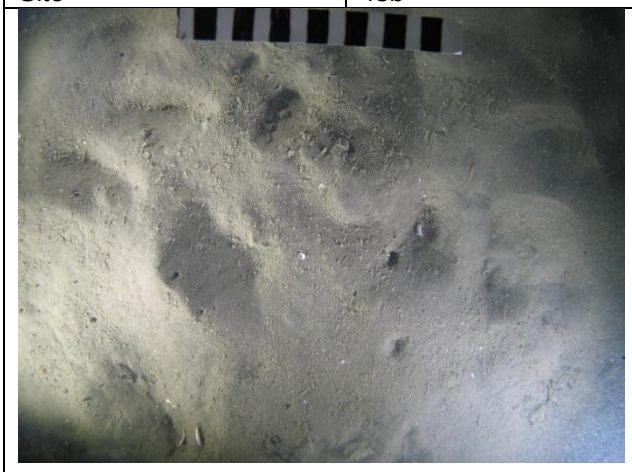
Date	06/06/11
Time	18:02 Hrs
Position	5757.164°N 0317.760°W
Depth (m)	51.3
Description	Very fine sand/mud (Suspended sediment in field of view). Possible aggregation of tubeworms left middle. Larger tubeworms protruding from sediment surface in centre. Burrows.

Site	43a

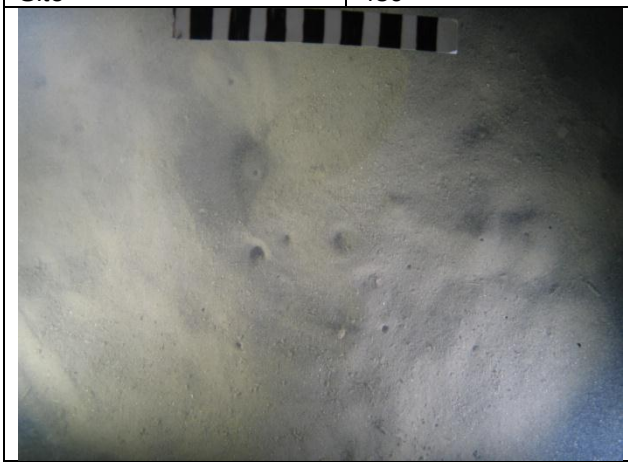


Date	10/06/11
Time	17:50 Hrs
Position	5756.715°N 0306.041°W
Depth (m)	60.6
Description	Mud (Suspended sediment in field of view). Burrows. No discernible fauna.

Site	43b



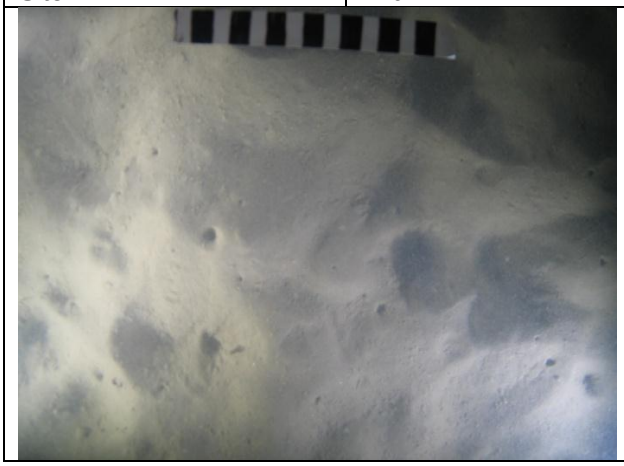
Date	10/06/11
Time	17:53 Hrs
Position	5756.708°N 0306.055°W
Depth (m)	58.5
Description	Very fine sand/mud with ripples/depressions. Tubeworm slightly protruding from sediment surface below scale bar. Burrows. Possible strand of orange hydroid below right of scale bar.

Site	43c
	

Date	10/06/11
Time	17:55 Hrs
Position	5756.720°N 0306.057°W
Depth (m)	59.7
Description	Mud (Suspended sediment in field of view). Tubeworm protruding sediment surface bottom centre. Burrows.

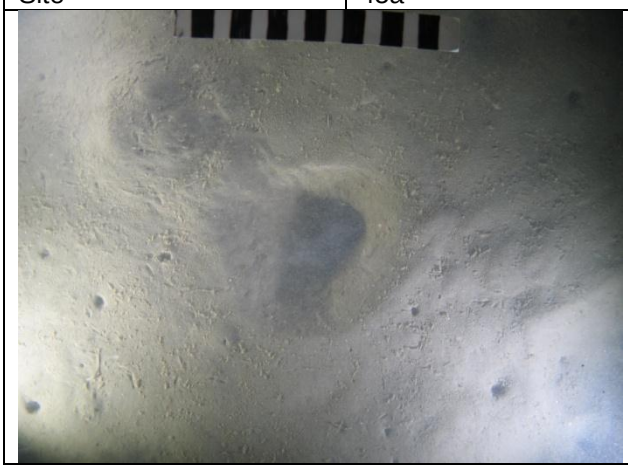
Site	44a
	

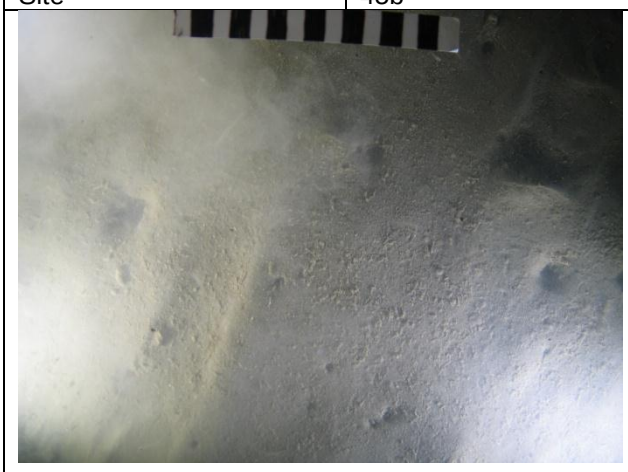
Date	12/06/11
Time	10:41 Hrs
Position	5753.996°N 0311.085°W
Depth (m)	65.2
Description	Mud Burrows and bioturbation. No discernible fauna.

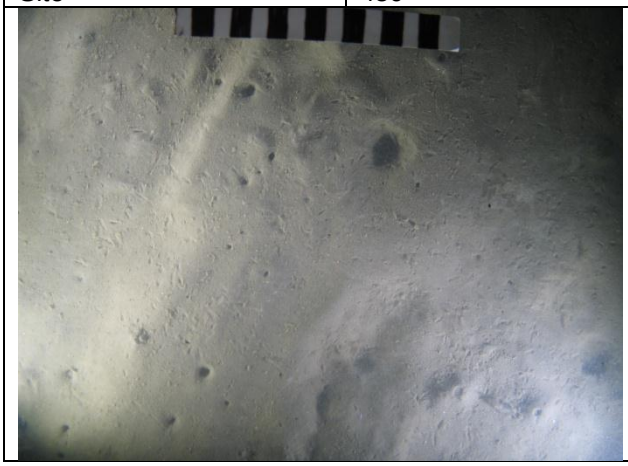
Site	44b
	

Date	12/06/11
Time	10:43 Hrs
Position	5753.992°N 0311.072°W
Depth (m)	64.8
Description	Mud (Suspended sediment in field of view). Burrows and depressions. No discernable fauna.

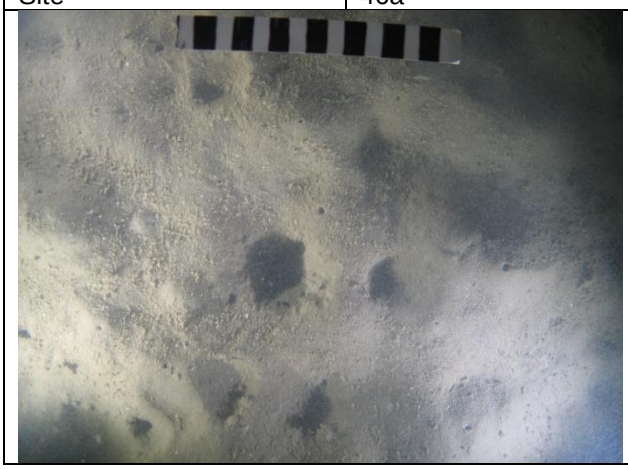
Site	44c	Date	12/06/11
		Time	10:45 Hrs
		Position	5753.987°N 0311.069°W
		Depth (m)	64.9
		Description	Mud (Suspended sediment in field of view). Transparent goby, *Aphia minuta* below scale bar. Burrows and depressions.

Site	45a	Date	10/06/11
		Time	19:07 Hrs
		Position	5749.273°N 0306.600°W
		Depth (m)	94.8
		Description	Mud. Large burrow/depression centre. Other smaller burrows.

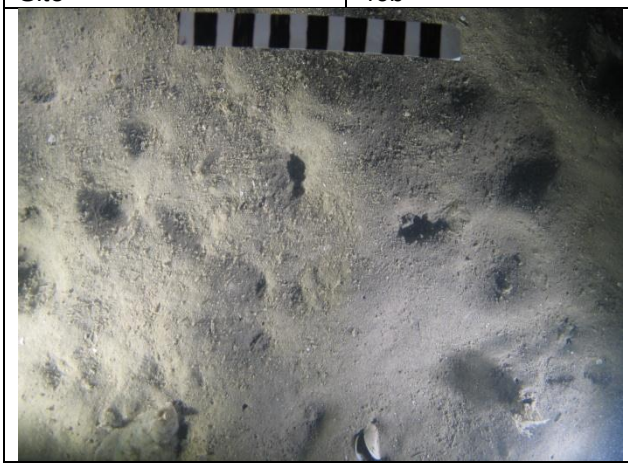
Site	45b	Date	10/06/11
		Time	19:10 Hrs
		Position	5749.282°N 0306.605°W
		Depth (m)	94.8
		Description	Very fine sand/mud.(Suspended sediment in field of view). Burrows. No discernible fauna.

Site	45c
	

Date	10/06/11
Time	19:13 Hrs
Position	5749.272°N 0306.617°W
Depth (m)	94.8
Description	Mud. Burrows and markings/tracks in sediment surface. No other discernible fauna.

Site	46a
	

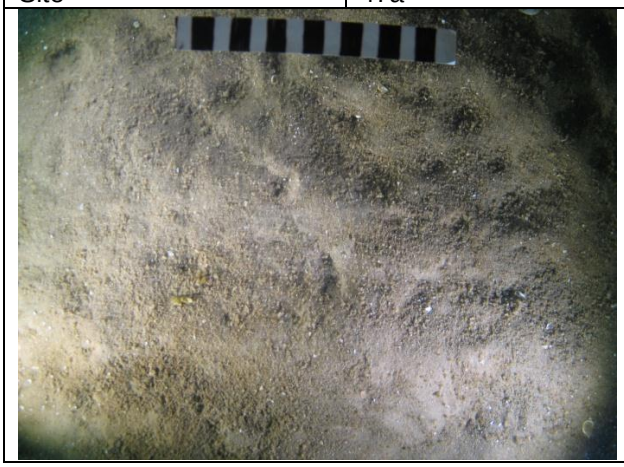
Date	12/06/11
Time	12:08 Hrs
Position	5748.930°N 0323.126°W
Depth (m)	56.7
Description	Very fine sand/mud. Burrows. No discernable fauna.

Site	46b
	

Date	12/06/11
Time	12:11 Hrs
Position	5748.929°N 0323.148°W
Depth (m)	56.4
Description	Very fine sand/mud. Plaice, *Pleuronectes platessa* bottom left. Hydroid/Bryozoa bottom right. Burrows.

Site	46c
	

Date	12/06/11
Time	12:13 Hrs
Position	5748.932°N 0323.141°W
Depth (m)	56.5
Description	Very fine sand/mud. Small branch of hydroid/bryozoa below scale bar. Burrows and depressions.

Site	47a
	

Date	12/06/11
Time	09:10 Hrs
Position	5745.523°N 0313.840°W
Depth (m)	24.1
Description	Medium sand. Small fragments of possible green algae middle left. Small depressions

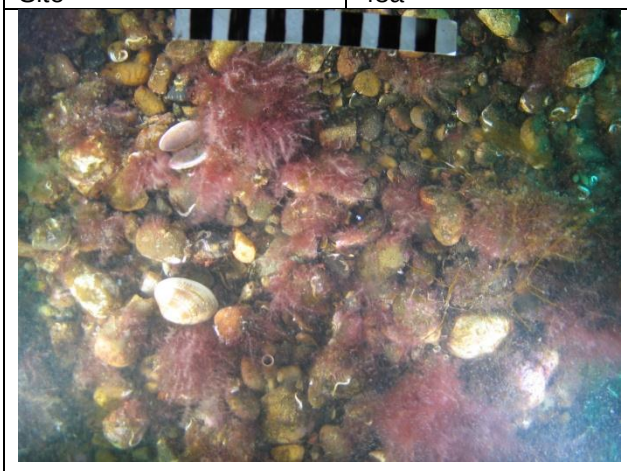
Site	47b
	

Date	12/06/11
Time	09:14 Hrs
Position	5745.523°N 0313.824°W
Depth (m)	24.2
Description	Medium sand and some fine shell fragments. Burrows/small depressions. No discernible fauna.

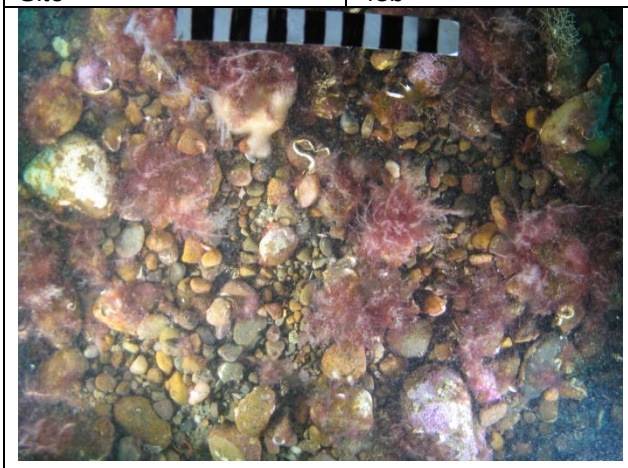
Site	47c

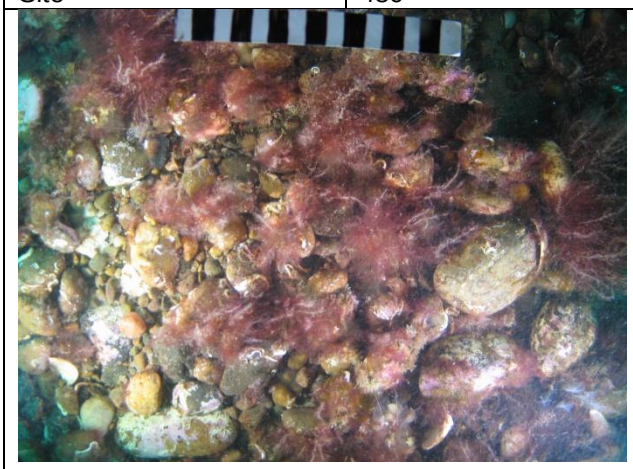
Date	12/06/11
Time	09:16 Hrs
Position	5745.532°N 0313.824°W
Depth (m)	24.1
Description	Medium sand and some fine shell fragments. Burrows. No discernible fauna.

Site	48a

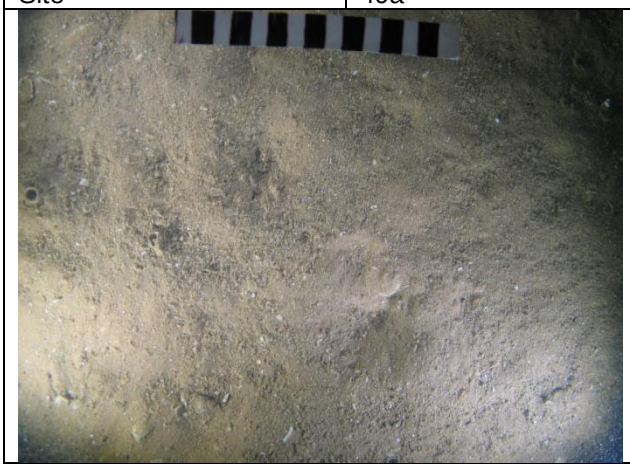


Date	09/06/11
Time	09:03 Hrs
Position	5742.318°N 0305.569°W
Depth (m)	14.8
Description	Pebble and some coarse gravel. Filamentous red algae and brown algae/hydroid. *Flustra foliacea*. Large distinct tubeworm middle bottom. *Pinnotheres sp*. on pebbles below left of scale bar. *Pomatoceros triqueter* and bryozoa encrusting some pebbles. Numerous *Galathea sp.* and *Munida rugosa*.

Site	48b	Date	09/06/11
		Time	09:05 Hrs
		Position	5742.315°N 0305.562°W
		Depth (m)	14.5
		Description	Gravel and pebble with some cobble. Filamentous red algae. White hydroid, *Kirchenpaueria pinnata. Alycyonium digitatum* and small white sponge below scale bar. *Pomatoceros triqueter* and encrusting pink algae, *Lithothamnion sp. on some pebbles. Galathea sp.* and *Munida rugosa*.

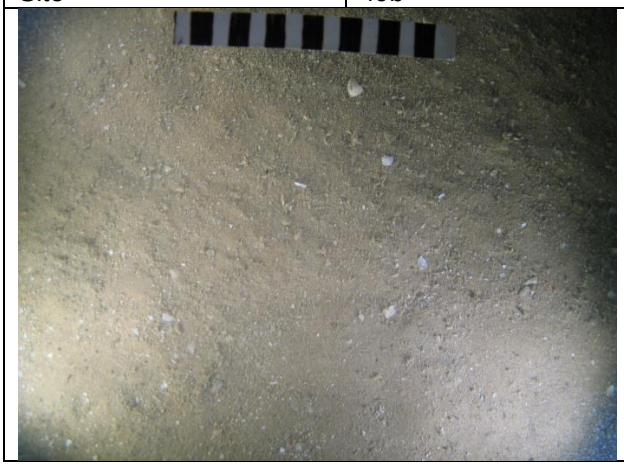
Site	48c	Date	09/06/11
		Time	09:07 Hrs
		Position	5742.320°N 0305.574°W
		Depth (m)	14.7
		Description	Coarse pebble, gravel and some cobble. Encrusting *Pomatoceros triqueter.* White and pink *Lithothamnion sp.* bryozoa on pebble. White hydroid, *Kirchenpaueria pinnata* and *Flustra foliacea*. Filamentous red algae. White sponge part hidden by scale bar. Aggregation of sea squirts, *Clavelina lepadiformis* below left of scale bar. *Galathea sp.* and *Munida rugosa.*

Site	49a



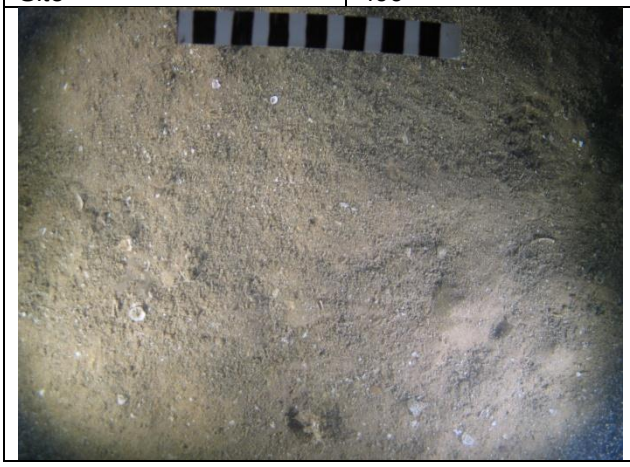
Date	07/06/11
Time	09:28 Hrs
Position	5748.548°N 0256.246°W
Depth (m)	39.6
Description	Medium sand. Tubeworms protruding from sediment surface left middle.

Site	49b



Date	07/06/11
Time	09:30 Hrs
Position	5747.095°N 0249.427°W
Depth (m)	40.0
Description	Medium sand and some fine shell fragments. No discernible fauna.

Site	49c



Date	07/06/11
Time	09:32 Hrs
Position	5747.101°N 0249.449°W
Depth (m)	40.1
Description	Medium sand Bryozoa bottom middle.

Site	50a

Date	06/06/11
Time	09:25 Hrs
Position	5743.685°N 0309.141°W
Depth (m)	18.0
Description	Sand, gravel and pebbles with occasional cobble. *Lanice conchilega* right of scale bar and centre. Some hydroids and encrusting pink bryozoan, *Lithothamnion sp.* on pebble top left.

Site	50b

Date	06/06/11
Time	09:28 Hrs
Position	5743.686°N 0309.114°W
Depth (m)	18.6
Description	Sand, gravel, pebble and some large cobble with dead shell. Encrusting *Pomatoceros triqueter* and pink bryozoan, *Lithothamnion sp.* on cobble. *Lanice conchilega* present on sand patches.

Site	50c

Date	06/06/11
Time	09:31 Hrs
Position	5743.693°N 0309.110°W
Depth (m)	18.8
Description	Sand, gravel, pebble and some large cobble. Encrusting *Pomatoceros triqueter.* Pink *Lithothamnion sp.* bryozoa on pebble. White hydroid, *Kirchenpaueria pinnata. Lanice conchilega* amongst pebbles. *Galathea sp.* and *Munida rugosa.* Hermit crab *Pagurus prideauxi* with *anemone Carciniopados* top right. Edible crab, *C.pagurus* centre of image.Mass of hydroid/bryozoa bottom centre. Small orange sponges on cobble.