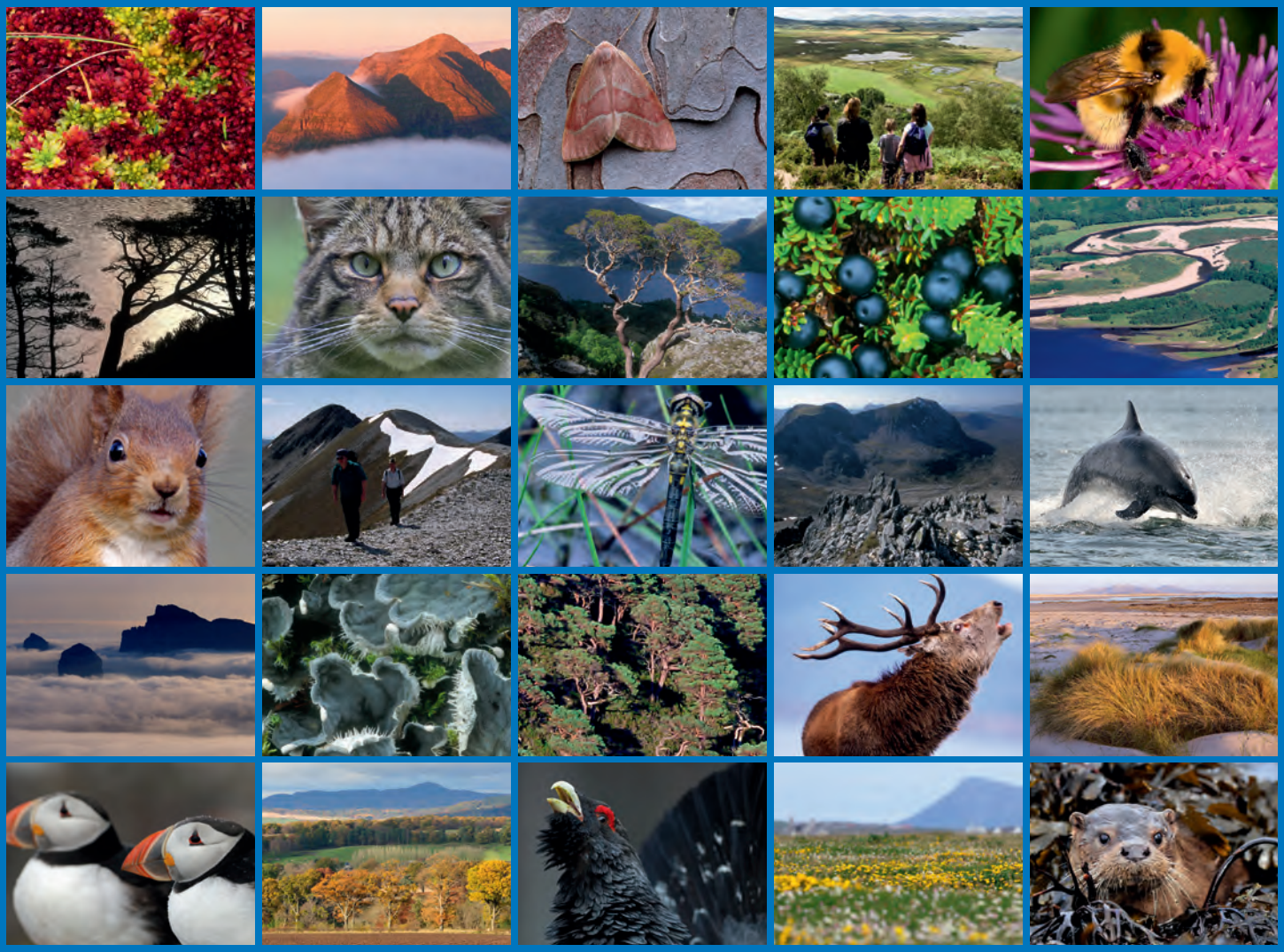
Scottish Natural Heritage
Commissioned Report No. 738

Survey of marine features within the Luce Bay and Sands Special Area of Conservation (SAC)



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COMMISSIONED REPORT

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COMMISSIONED REPORT

Summary

Survey of marine features within the Luce Bay and Sands Special Area of Conservation (SAC)

Commissioned Report No. 738
Contractor: Seastar Survey Ltd.
Year of publication: 2014

Background

Seastar Survey Ltd. was contracted by Scottish Natural Heritage (SNH) to conduct a targeted survey on the extent, distribution, and quality of benthic habitats in the Luce Bay and Sands Special Area of Conservation (SAC), funded by Marine Scotland. The habitats targeted for detailed survey included known areas of *Sabellaria alveolata* and rocky reef communities. Areas where existing evidence suggested the presence of *Modiolus* and maerl were also investigated. In addition, sampling was undertaken across the site where no previous seabed data had been acquired to enhance the existing knowledge-base.

A drop-down video survey was undertaken in stages between July and September 2012, to investigate benthic habitats, together with a foot based intertidal survey to map the extent of *Sabellaria alveolata* reefs. A benthic grab survey was undertaken on 9th – 10th June 2013 to determine the biotopes of some of the soft sediment areas identified during the drop down camera survey.

Main findings

- A total of 138 camera drops were undertaken, with approximately 12 hours, 47 minutes of video footage recorded, and 1434 seabed still photographs were taken. A total of 38 different biotopes were identified within Luce Bay, with 178 different taxa observed from the video footage and still images.
- The head and centre of Luce Bay were dominated by muddy-sand habitats (**SS.SSa.CMuSa** and **IMuSa**), characterised by high numbers infaunal burrows, brittlestars and large amounts of organic matter covering the surface of the sediment.
- The western coastline was composed of coarse mixed sediment habitats (**SS.SMx.IMx**), with infralittoral rock habitats dominated by kelp and red algae (**IR.HIR.KSed** biotope complex) more frequently observed in the south-west. The eastern coastline had some infralittoral rock biotopes towards the south-east and north-east, but muddy-sand habitats in the centre.
- The mouth of the bay was characterised by coarse sand and gravel (**SS.SCS.CCS**), with some transition into hydroid and bryozoan dominated mixed sediment habitats (**SS.SMx.CMx.FluHyd**). Around the Scares and off the Mull of Galloway a range of circalittoral rock biotopes were found (**CR.HCR.XFa** and **CR.MCR.EcCr** biotope complexes).
- A large maerl bed composed of *Phymatolithon calcareum* was found in the middle of the mouth of the bay. Live maerl cover ranged from 5 – 30%, and coverage with

dead maerl fragments reached up to 90 – 95%. This represents the first confirmed record of a maerl bed within Luce Bay, and was the only Priority Marine Feature observed during the survey.

- Large amounts of dead *Modiolus modiolus* shells were found across the site. These aggregations are unlikely to be found at the source of the original mussel beds, and their observed positions are more likely due to current / tide or anthropogenic effects.
- Several areas of *Sabellaria alveolata* were mapped by foot along the eastern coastline. These reefs appeared to be in good condition.
- Annex I reef habitats were found at the mouth of Luce Bay. A total of 20 stations were categorised as stony reefs, and assessed according to elevation, size of hard substrata and abundance of epifauna. The relative reefiness varied from low to medium.
- There was a broad agreement between the habitats observed during this drop-down camera survey and the broadscale biotope map created by ERT Ltd. from the 2007 survey of Luce Bay.
- A total of 18 grab samples were collected from 16 stations, with a triplicate sample taken from the maerl bed identified from the drop-down camera survey. Particle size analysis and faunal identification were undertaken on all samples collected.
- A range of different sediment types were sampled from the grab survey, including gravels, well sorted gravelly-sand and poorly sorted muddy-sand. The presence of the maerl bed at the mouth of Luce Bay was confirmed by the collection of *Phymatolithon calcareum* maerl fragments within the samples taken at station LB115.
- A total of 1753 individuals from 194 different taxa were identified from the grab samples. Multivariate analysis of the faunal communities clustered the samples into four main groups, which closely related to the sediment classifications of the samples.

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1. INTRODUCTION

Seastar Survey Ltd. was contracted by Scottish Natural Heritage (SNH) to conduct a targeted survey on the extent, distribution, and quality of benthic habitats in the Luce Bay and Sands Special Area of Conservation (SAC). The habitats targeted for detailed survey included known areas of *Sabellaria alveolata* and rocky reef communities. Areas where existing evidence suggested the presence of *Modiolus* and maerl were also investigated. In addition, sampling was undertaken across the site where no previous seabed data had been acquired to enhance the existing knowledge-base. The data obtained in the 2012-13 survey will be used to complement the data collected during a broadscale mapping survey conducted by ERT Ltd. in 2007 (ERT Ltd., 2011), and allow the development of management plans for the Luce Bay and Sands SAC.

SNH had identified several areas of particular interest based on the broadscale biotope map created by ERT Ltd. (2011) (see Figure 1), and these 'key areas' were used to plan the survey stations. There were six principal objectives to the survey:

1. Improve information held on the distribution of S*abellaria* on the seaward side of the south-eastern shoreline (key area 5).
2. Investigate the potential presence of maerl around the site of a previous BGS record and a possible observation on 2007 video footage (key areas 1 and 6).
3. Improve the resolution of seabed habitat records (particularly in the band MLWS to 1 km offshore) and investigate the potential presence of *Modiolus* in the north-west (key area 2).
4. Improve the resolution of seabed habitat records in the south-west of the bay, which contains a complex distribution of biotopes including rich kelp and rocky reef communities, paying particular attention to the area from Drummore to Mull of Galloway, including Maryport Bay (key area 3).
5. Improve information on the benthic habitats around the rocky reef outcrops in the centre of the bay ('The Scares'), where associated communities were probably under-recorded by the previous survey (key area 4).
6. Obtain additional ground-truthing of stations and fill in gaps from the broadscale mapping survey carried out in 2007 (within Luce Bay as a whole).

As part of their report on the 2007 survey ERT Ltd. (2011) produced a comprehensive section detailing the background environment of Luce Bay, including the physical conditions and the general ecology. This introduction briefly summarises some of the key sections from ERT Ltd. (2011) with respect to the survey planned by Seastar Survey in 2012-13.

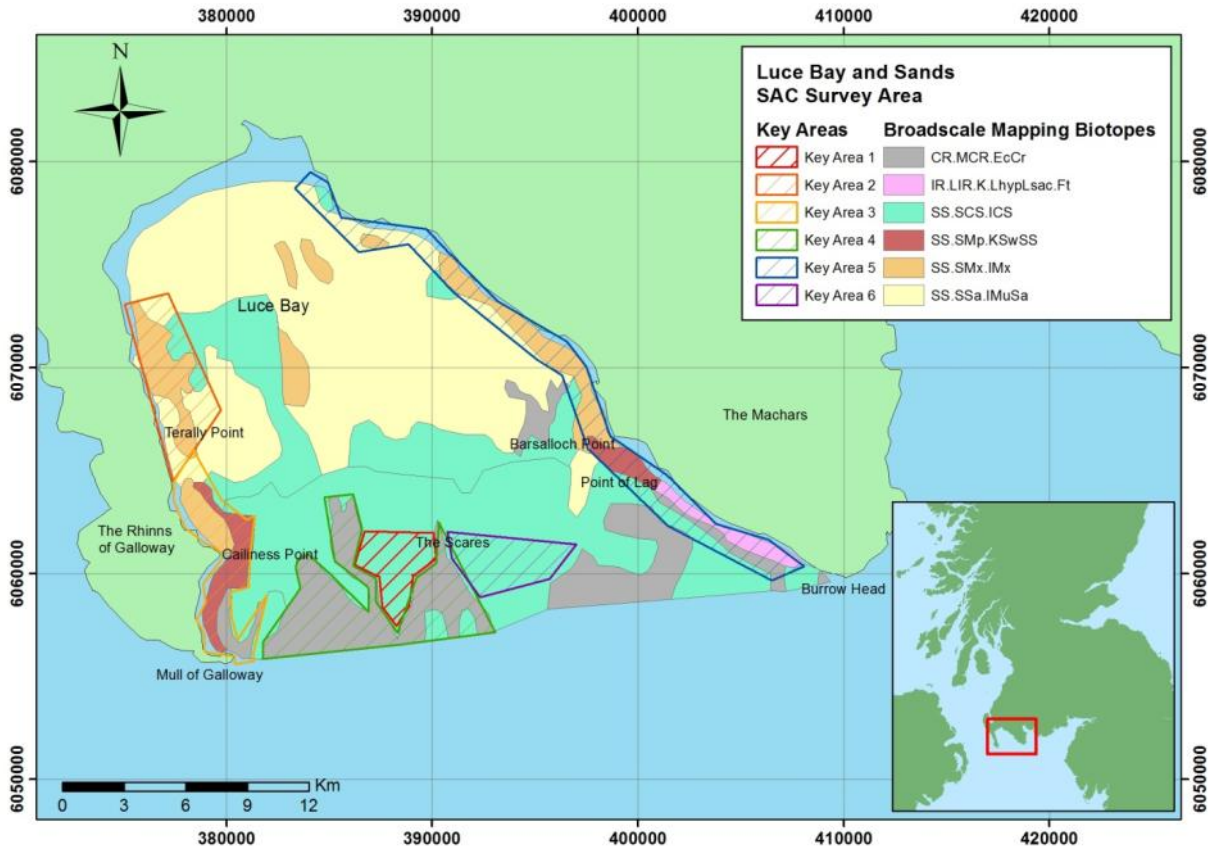


Figure 1. Luce Bay and Sands SAC showing Key Areas for the 2012 survey. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

1.1. Luce Bay and Sands SAC

Luce Bay and Sands SAC lies within the Scottish county of Dumfries and Galloway, to the south of Stranraer. Luce Bay is a broad, shallow embayment approximately 10.5 km wide at its head, lying between The Machars and the Rhinns of Galloway. The bay reaches its greatest width (31 km) between the two outer headlands; the Mull of Galloway to the north-west and Burrow Head at the south-east (ERT Ltd., 2011). The area was designated as the Luce Bay and Sands SAC in 2005. There are four Annex I marine features of conservation importance within the SAC:

- Large shallow inlets and bays;
- Sandbanks which are slightly covered by seawater all the time;
- Mudflats and sand flats not covered by seawater at low tide;
- Reefs

The SAC comprises the whole of Luce Bay, with a seaward boundary defined by a straight line between the Mull of Galloway and Burrow Head headlands. This covers an area of approximately 48,000 ha (ERT Ltd., 2011). The head of Luce Bay is characterised by extensive intertidal sandy sediments, backed by sand dunes. The headlands are composed of steep rock and boulders. The eastern and western coastlines are composed of mixed boulder shores. The fauna and flora present reflect a range of wave exposures and habitat stability. A collection of offshore rocks, known as The Scares, lies centrally at the mouth of the bay. The inner bay has a seabed characterised by fine sands, mixed with small amounts of mud, shell gravel and empty shells. The outer part of Luce Bay has extensive areas of hard substrate seabed, which generally consist of a mixture of bedrock, boulders, cobbles

and pebbles. There are some areas of sediment including mobile sands and gravels. There are areas of bedrock on the seabed close to the headlands at the mouth of Luce Bay and at The Scares (ERT Ltd., 2011).

1.2. Previous surveys

Prior to the broadscale mapping survey conducted by ERT Ltd. in 2007, there had been limited information on the intertidal flora and fauna of Luce Bay, whilst data on the subtidal flora and fauna were extremely scarce. Table 1 (from ERT Ltd., 2011) outlines the sources of data prior to the 2007 survey.

Table 1. Sources of habitat data in Luce Bay prior to 2007 survey (taken from ERT Ltd., 2011)

Data Source	Description	Reference
1973 Marine flora and fauna of the Solway Firth	A broad review of the flora and fauna of the Solway Firth, briefly describing five sites in Luce Bay	Perkins (1973)
1976 Intertidal fauna of sandy beaches in Scotland	A study of Scottish sandy beaches, including one site at Sandhead in Luce Bay	Eleftheriou & McIntyre (1976)
1989 MNCR Mull of Galloway to Auchencairn littoral survey	An MNCR littoral survey was carried out in the outer Solway Firth. 18 intertidal sites between the Mull of Galloway and Auchencairn Bay were surveyed; eight sites around the shores of Luce Bay were described. Both rocky and sediment shores were surveyed.	Covey (1990)
1990 MNCR Mull of Galloway to Auchencairn sublittoral survey	An MNCR sublittoral survey was carried out to complement the earlier littoral survey. 26 sublittoral sites from the Mull of Galloway to Auchencairn Bay were surveyed, 15 of which fell within Luce Bay. The survey aimed to provide a description of the range of sublittoral habitats and associated communities in the outer Solway Firth and to make an assessment of the biological interest and nature conservation importance of the area. Both rocky and sediment areas were surveyed using diving and remote sampling techniques	Covey (1992)
1991 MNCR Dumfries and Galloway littoral survey	A second MNCR littoral survey was carried out in June 1991 to cover an additional 18 sites on the same stretch of coast, filling in the gaps in the original survey coverage. As part of this study four sites were surveyed in Luce Bay.	Covey & Emblow (1992)

In 2007 SNH commissioned a survey of Luce Bay and Sands SAC, conducted by ERT (Scotland) Ltd. The survey aimed to derive broadscale maps for the intertidal and subtidal Annex I habitats within the SAC in order to inform the development of a management plan for the area. Some biotopes identified in the earlier surveys of Covey (1990) and Covey and Emblow (1992) were not recorded during the mapping survey, which was explained by differing sampling methodologies and survey areas rather than changes or loss of habitat.

The most significant difference between the 2007 survey and previous surveys of Luce Bay was the discovery of extensive *Sabellaria alveolata* reefs on the north-eastern coastline. Limited patches of *Sabellaria alveolata* were observed by Covey and Emblow (1992), and remarks were made about its potentially declining status. ETR Ltd. (2011) found the reefs in apparent good condition, suggesting that the reefs found in 2007 were unrecorded in previous surveys, rather than significant reef recovery having occurred in the interval between surveys.

1.3. Physical environment

1.3.1. Bathymetry

Luce Bay is a relatively shallow embayment. The majority of the bay has a depth of 20 m or less (SNH, 2006). The bay is divided into a shallower inner half and a deeper outer half, with a step down from about 17 – 20 m running across the bay from Barsalloch Point in the east to a position about 3 km off Terally Bay on Galloway (ERT Ltd., 2011). The Scares are bounded on either side by channels which reach depths of 23 - 26 m (SNH, 2006). Outside the boundaries of the SAC, water depth increases down to 50 m off of the Mull of Galloway and Burrow Head headlands (ERT Ltd., 2011).

1.3.2. Tides and currents

Tidal currents rotate anti-clockwise within Luce Bay, with a peak spring rate of ~0.6 ms^{-1} (Ramsey & Brampton, 2000). Tidal ranges vary between 2.9 m at neap tides and 5.3 m on spring tides (Ramsey & Brampton, 2000). During the flood stream an eddy runs west towards Cailiness Point on the west coast of Luce Bay, and then south to the Mull of Galloway. Along the eastern coastline, between Burrow Head and the Point of Lag, tidal currents follow the coastline on both the flood and ebb tide. Towards the head of the bay currents are weak and irregular (ERT Ltd., 2011).

1.3.3. Water characteristics

The waters of Luce Bay are fully saline, with a salinity of 34 throughout the year (BGS, 1996). Freshwater inputs (e.g. Piltanton Burn and the Water of Luce) may cause localised areas of reduced salinity on the north-east side of the bay (ERT Ltd., 2011). Mean near-bottom temperatures vary between 8.5 °C – 13.5 °C (Parker-Humphreys, 2004). Mean surface water temperatures (based on generalised patterns across the Irish Sea) are suggested to range from ~7 °C in winter to 14 °C in summer (BGS, 1996).

1.3.4. Exposure to wave action

The dominant wind direction within the Irish Sea is from the south-west, exposing the eastern shore of Luce Bay to most wave action. Shelter increases from east to west, with the Mull of Galloway offering some protection to the western shores of Luce Bay. The relatively shallow offshore water depths further reduce the severity of wave action (ERT Ltd., 2011).

1.4. Biological environment

Detailed descriptions of both the intertidal and subtidal environment and biological communities recorded so far within Luce Bay can be found in the broadscale mapping report by ERT Ltd. (2011).

1.5. Marine habitats and species of conservation interest

1.5.1. Sabellaria *reefs*

Sabellaria reefs are formed by the polychaete worms *S. alveolata* or *S. spinulosa.* The worms construct densely packed tubes made of sand grains, forming large reefs. The reefs provide a habitat for many different types of flora and fauna, such as seaweeds, barnacles, whelks, bivalves, other polychaetes, and crustaceans, thus increasing the biodiversity of the area (UKBAP, 2008a). Although individual worms have a life expectancy of between three and five years, the reefs can last much longer due to larvae settling on existing colonies.

Sabellaria reefs are one of the UK Biodiversity Action Plan Priority Habitats and have a very limited distribution around the UK. Reefs extend from southern England up into the Irish Sea. The reefs found in Luce Bay and along the northern shore of Solway Firth are the only confirmed reefs in the west of Scotland (ERT Ltd., 2011).

Sabellaria alveolata reefs occur on the lower third of the shore, and do not extend into low salinity areas. Reefs can be 30 – 50 cm thick, and are found on a variety of hard substrata, from pebbles to bedrock (UKBAP, 2008a). *Sabellaria spinulosa* reefs are subtidal and are at least several centimetres thick. The reefs are raised above the surrounding seabed, and persist for many years (UKBAP, 2008b). Establishment of *Sabellaria* reefs requires a good supply of sand grains, and a hard substratum to anchor on in areas of strong water movement. Successive worms are able to attach to the tubes of the original concretion, meaning large reefs can form in sandy areas (UKBAP, 2008b).

1.5.2. Maerl beds

Maerl is the collective name for several coralline red algae including *Phymatolithon calcareum* and *Lithothamniom corallioides*. Maerl grows unattached and can form extensive beds within favourable conditions (i.e. in photic areas with strong water movements). The beds have a greater structural heterogeneity than adjacent substrata (Kamenos *et al.,* 2004). Maerl beds belong to the biotope **SS.SMp.Mrl.** High biodiversity is one of the key characteristics of this biotope, which awards it high conservation value (Birkett *et al.,* 1998). Pristine live maerl (PLM) beds are an important nursery ground for the commercially important queen scallop *Aequipecten opercularis* (Wilding *et al.,* 2005) and for other invertebrates including the soft clam *Mya arenaria,* the urchins *Psammechinus miliaris* and *Echinus esculentus* and the starfish *Asterias rubens* (Kamenos *et al*., 2004). Physical disturbance can degrade PLM into impacted dead maerl (IDM). IDM forms habitats of its own buried under a thin layer of pink, living maerl (Birkett *et al*., 1998), but has a reduced biodiversity compared to PLM (Kamenos *et al*., 2004).

Maerl is included in four different habitat types in Annex I of the Habitats Directive: ‘Sandbanks which are slightly covered by seawater at all times’; ‘Large shallow bays and inlets’; ‘Estuaries’ and the priority habitat ‘Lagoons’ (UKBAP, 2010).

1.5.3. Horse mussel beds

Beds of the horse mussel *Modiolus modiolus* are identified as biogenic reefs under the Habitats Directive (Brown *et al*., 1997). *Modiolus* beds are a distinct biotope and are present in two Annex I habitats: Large shallow inlets bays, and Reefs. They are common in the north and west of the UK, in fully saline, tide swept areas. *Modiolus modiolus* individuals often live for up to 25 years, with low and sporadic recruitment, resulting in a slow recovery from damage (UKBAP, 2008c). A wide range of flora and fauna is associated with *Modiolus* reefs, including sponges, whelks, crabs and fish. They also potentially play a role as a nursery area for other species (UKBAP, 2008d). A study on three sites on the west coast of Scotland identified almost 300 species of fauna and flora associated with *M. modiolus* beds (Mair *et al.,* 2000).

1.5.4. Stony reefs

Reefs are a habitat listed in Annex I of the Habitats Directive for protection within Special Areas of Conservation (Brown *et al*., 1997). The reef habitat includes both stony reefs and biogenic reefs. A stony reef is defined by containing a minimum of 10% of cobbles (between 64mm – 256mm diameter) and boulders (> 256 mm diameter). The "reef" should contain a higher level of epifaunal species than infaunal species. Stony reef features play an important role in the establishment of a range of floral and faunal benthic communities (Irving, 2009). In the 2007 survey by ERT Ltd. stony reefs were discovered, but under-recorded in the centre of the bay.

1.6. Anthropogenic influences in Luce Bay and Sands SAC

1.6.1. Fishing and associated activities

Both commercial and recreational fishing are regarded as important anthropogenic impacts within Luce Bay. A wide range of fishing practices takes place within Luce Bay including electrofishing, hydraulic fishing, creel/pot fishing, line fishing, netting, dredging and trawling (SNH, 2006).

Currently the fishing management within Luce Bay is based on seasonal closures of the bay to vessels using mobile fishing gear. Luce Bay is closed to mobile gear fishing between 1st March and 31st August each year, and to scallop dredging in particular from 1st March to 31st October. Scallop vessels have further restrictions including only operating a maximum of 8 dredges per side, and adhering to the minimum landing size for scallops of 110 mm (Marine Scotland, 2011). Unfortunately it is unlikely that these closures will be effective for the protection of long lived or habitat forming species such as maerl and subtidal *Sabellaria* reefs. In 2011, a consultation was opened up by the Scottish Government for the management of fisheries in Luce Bay SAC. The aim of this consultation was to look at the way mobile fishing gear was used within the SAC, and to ensure the protection of the features for which the SAC was designated. A secondary aim was to ensure the management in Luce Bay is in line with the potential changes to scallop fishing management around the UK (Marine Scotland, 2011). The commissioning of this survey was an action point arising from the consultation process, and will inform further discussions.

1.6.2. MOD firing range

The Ministry of Defence (MOD) has a firing range at West Freugh, originally run by the Royal Air Force and taken over by QinetiQ in 2001. The range has been used for research and development of weapons within the area since 1957, and covers over 1140 hectares of the Luce Bay area. The site was used as a bombing range before 1957, but it was combed and

bomb debris removed before the new designation of research facility in 1957. Luce Bay is currently viewed by the MOD as an important test and procurement range for the evaluation of the next generation of weapons. It is also used to service existing weapon systems requiring an upgrade. Cluster bombs have been tested in Luce Bay in the past and it is suspected that unexploded cluster bombs remain in the marine habitat (Martin & Smith, 2009), although some unexploded ordinance has been capped with concrete. The military activity could have a detrimental impact on SAC qualifying habitats and communities within the site, but conversely there could also be a positive impact through the exclusion of fishing boats from the area, thus reducing fishing and associated impacts (Hansom, 2003).

2. METHODOLOGY

The survey was undertaken in two main phases. The first phase consisted of an investigation of *Sabellaria* reefs, and a subtidal habitat survey using a drop-down camera system. The investigation of the *Sabellaria* reefs by foot and rigid inflatable took place between 10th and 13th July 2012, with some additional mapping work undertaken by foot on 4th August 2012. The subtidal camera investigation was undertaken between 8th August and the 10th September 2012, with some interruptions due to poor weather conditions. All survey operations were undertaken from Seastar Survey's own vessel, SV *Otarie*. Subtidal camera operations were conducted out of two harbours, Kirkcudbright and Portpatrick.

The second survey phase involved benthic grab sampling of the subtidal habitat. The grab survey was undertaken between 9th and 10th June 2013, using a local fishing vessel as a survey platform. The vessel was mobilised in Port William harbour on the morning of 9th June. Port William was the port of operations for the duration of the survey. Demobilisation took place at the end of survey operations on 10th June in Port William.

2.1. Subtidal camera survey

A total of 138 camera drops were undertaken. Figure 2 shows the locations of the surveyed camera stations. A total of 12 hours, 47 minutes and 39 seconds of video footage, and 1434 seabed still photographs were taken. Full survey logs can be found in Appendix A, including the start and end of line positions for each video transect. The positions for each still photographic image can be found in Appendix B.

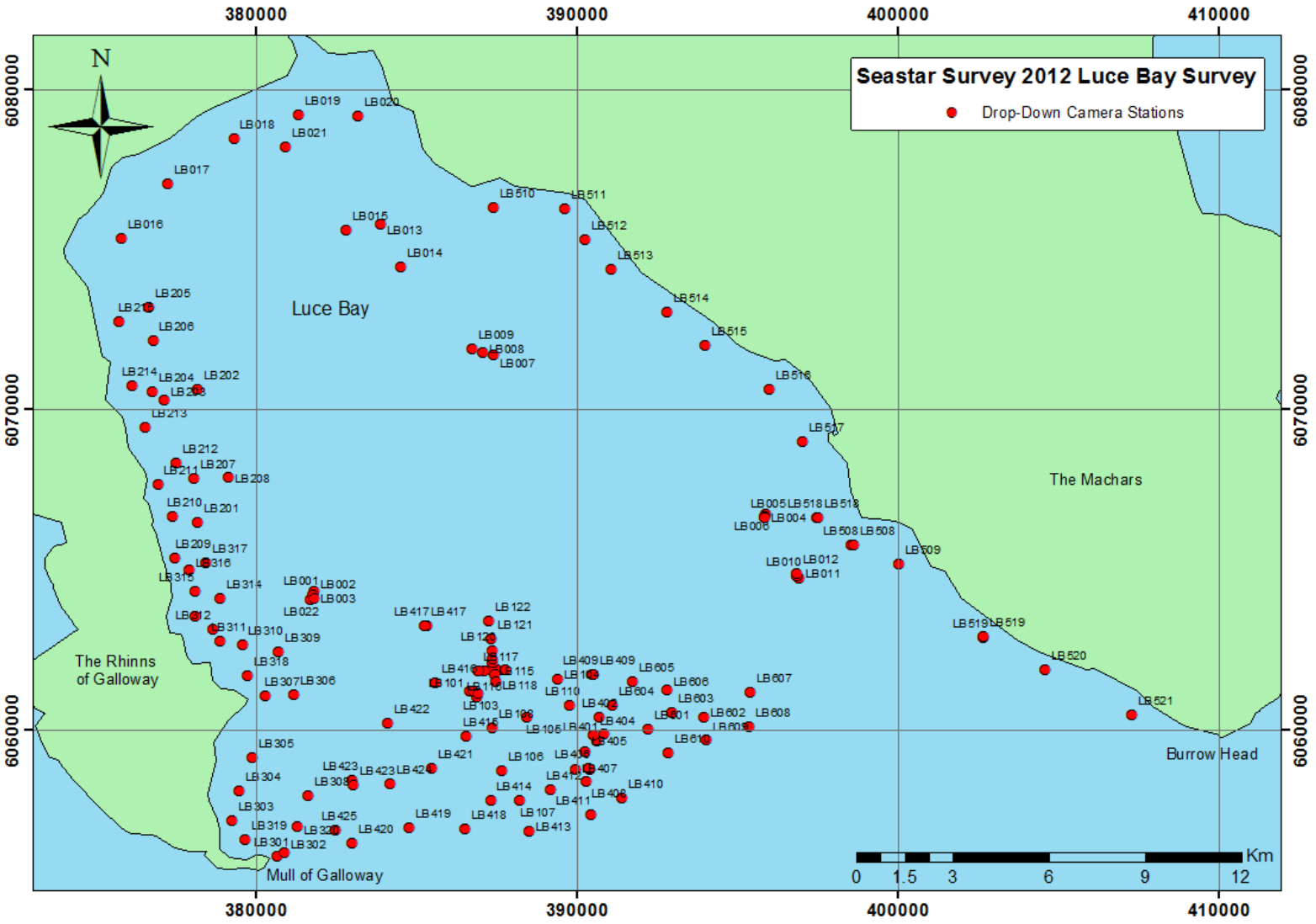


Figure 2. Location of subtidal camera stations, Luce Bay and Sands SAC survey 2012. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

Camera deployments were placed in order to achieve the six principal survey objectives, using data from the 2007 ERT survey provided by SNH to target specific areas within Luce Bay. There was scope to add stations in the field to fully investigate and delimit the boundaries of any observed features of particular interest. Camera stations were planned to consist of 5 minute video lines, which could be extended if features of particular interest were observed.

The camera system used was a Kongsberg OE 14-208 digital video and stills camera, mounted obliquely on a drop-down camera frame. A Kongsberg OE 11-242 flash gun and four LED sub-sea lights were also mounted on the frame. The camera, flash and lights were linked to the surface using a 100m soft umbilical. All the controls for the camera system were kept in the vessel's wheel house.

The camera sent a continuous video feed to the surface, where the deployment was monitored and the camera was controlled by the camera operator using the Kongsberg OE 14-208 Graphic User Interface (GUI) software on a laptop connected to the camera control box via a USB connection. The analogue video from the camera was recorded throughout each deployment onto mini digital video (MiniDV) tapes using two MiniDV recorders. Each time a photograph was taken a representation of each still photograph was also seen in real time on the MiniDV recorder monitor. Photographs were taken by the camera operator to capture representative images of the dominant seabed habitats and sediment types along the video transect. Images were also taken to capture interesting features, with a particular focus on identifying any key fauna, seabed features or sediment types.

Before each deployment a 'clapperboard' displaying the site name and date was videoed and photographed. The camera was deployed over the port side of the vessel by a line via a capstan and davit. Once the camera system was in the water and approximately 1m above the seabed the on-board surveyor began to log navigation data. The skipper positioned the vessel into the tide and began to make way along the transect line. The optimal speed for the camera transects was 0.5 knots. During the deployment the height of the camera system above the seabed was controlled by a winch operator on deck, but within clear sight of a live feed of the seabed from the camera.

Throughout the camera deployment navigation data were recorded. Survey navigation was achieved by the use of a differential GPS. Position data were logged using the Hypack 2012 survey management software. All navigation data for the survey were collected and logged in WGS84 latitude and longitude (decimal degrees) to a minimum of 6 decimal places. Navigation data were converted to UTM zone 30N (0°-6° W) within the Hypack software. All raw and processed positions were logged throughout survey operations. All camera deployment logs were synchronised to the navigation data from the GPS system. The camera operator recorded the time in UTC from the GPS at the start and end of each deployment and the time each photograph was taken. The position of each photograph was then extracted from the navigation data.

While recording the video lines the camera frame was suspended just off the seabed to reduce the impact on the seabed environment. The camera was landed on the seabed to take photographs; this is particularly advantageous in areas of high current speeds where high levels of suspended sediment in the water column and greater speeds over the ground can otherwise result in blurred photographs.

The digital photographs from the camera were uploaded from the camera to a survey laptop computer via a USB lead (using Canon Zoom Browser EX software). During the upload process each photograph was named with the sample number, line number and photograph number. Following the survey the MiniDV tapes from the video camera were uploaded to a computer, edited, titled and burnt to DVD at Seastar Survey's office in Southampton.

Raw depth data were provided by SV *Otarie's* echosounder and were logged using the Hypack software during camera deployments. The position of the camera system was calculated as a lay-back from the vessels GPS system. Both the vessel and the camera position were recorded in the Hypack survey management software. The lay-back was calculated within the survey management software, which bases its calculation on the vessel's known position, vessel heading, davit height, and the length of rope out.

2.2. *Sabellaria alveolata* reef investigation

To delimit the seaward extent of *Sabellaria alveolata* on the eastern side of Luce Bay, a shore based assessment was carried out at low tide to establish the locations of *Sabellaria* reefs. Seven areas were to be initially assessed based in the areas where *Sabellaria* was recorded in the 2007 survey. After examination of the locations where *Sabellaria* had been previously recorded, the remaining eastern coastline of the Bay was assessed as to the suitability of the intertidal habitat to support *Sabellaria*. Those areas deemed to be suitable were investigated more rigorously by foot. Where *Sabellaria* reef was found, the reef extent was mapped by foot.

The on-foot mapping of the *Sabellaria* reefs was undertaken by a pair of field scientists. Positioning was provided by a Garmin GPSMAP 276C portable chartplotter. The scientists walked as a pair around the extent of each reef. The scientist carrying the GPS walked along the edge of the reef, while the second scientist walked parallel but several metres away from the reef in order to check that the true extent of the reef was being mapped. Track plots were recorded on the GPS and downloaded at the end of each day onto the survey laptop. Representative photos of each reef area were taken, and the time and position at the start and end of each track plot was logged. Waypoints were taken at any notable locations (e.g. area of highest reef density, southern most limit of the reef etc.), and these positions were logged and recorded on the GPS. Fourteen discrete areas of *S. alveolata* reef were mapped on foot using the hand held Garmin GPS.

Once the locations of the main areas of *Sabellaria* had been established, the seaward extent of *Sabellaria* along the east coast was mapped from a 3.5 m inflatable tender and surveyed using a lightweight pole mounted camera (polecam). A series of shore normal transects were run into Luce Bay towards the areas of *Sabellaria* reef identified during the shore-based assessment. This ensured no *Sabellaria alveolata* reefs were missed in the lower intertidal, and confirmed whether *Sabellaria spinulosa* reefs were present in the shallow subtidal. A total of 24 polecam video lines were recorded

The polecam set-up consisted of a Bowtech LC3 underwater video camera mounted on a lightweight pole and connected to the surface by an umbilical. The pole was deployed over the side of the inflatable by one of the field scientists and the height of the camera was adjusted by hand. The camera sent a continuous feed to the surface where the deployment was monitored. The analogue video from the camera was recorded throughout the deployment using a Sony HDV video recorder onto MiniDV tape. The MiniDV recorder and power supply for the recorder and camera were kept in a custom made waterproof housing. Positioning was provided by a Garmin GPSMAP 276C portable chartplotter. The start and end positions of each video line were logged, and the track plots of each video line recorded on the GPS. These track plots were downloaded at the end of each survey day onto the survey laptop.

2.3. Benthic grab sampling survey

After initial analysis of the drop-down camera data and consultation with SNH, several stations were selected for benthic grab sampling. Three stations were regarded as priority targets. The first was LB115, where three replicate samples were to be collected from a maerl bed identified from the drop-down camera station. The second was station LB602, which was a repeat of a site sampled by ERT in 2007, and a potential maerl location. The third priority station was LB306, where large quantities of dead *Modiolus* shells were identified from the drop-down camera survey. The remaining stations were selected to provide infaunal data to aid with biotope classification of soft sediment habitats, and to cover a geographic spread over the bay.

A total of 16 grab stations were sampled successfully, including all three priority stations noted above (Figure 3). A full field log of the benthic grab survey can be found in Appendix C.

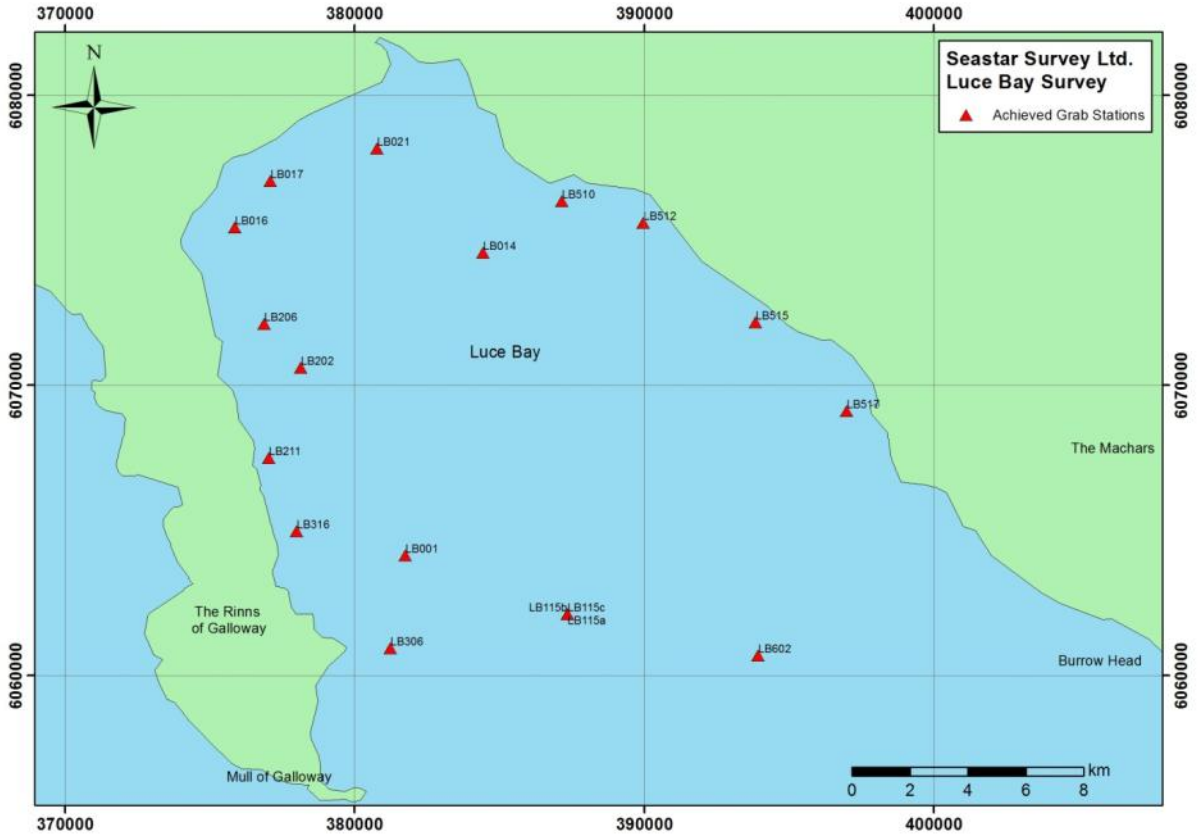


Figure 3. Location of benthic grab sampling stations, Luce Bay and Sands SAC survey. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

Survey navigation was achieved by the use of a Garmin GPS 72H hand held GPS device. Data were logged by hand in the field. Raw navigation data for the survey were collected and logged in WGS84 Latitude and Longitude. Raw depth data were provided by the onboard echosounder and logged manually at each grab location.

Grab sampling was carried out using a 0.1m^2 van Veen grab. Prior to deployment the grab was checked to ensure cleanliness. The vessel was manoeuvred to the drop location, and the position maintained by the skipper. The grab was deployed over the starboard side of the vessel, and manually lowered to the seabed. Once the grab had hit the seabed,

determined by the line going slack, a position fix was recorded. The grab was then retrieved to the surface using the onboard hydraulic pot hauling winch, and manually lifted over the side rails and on to the deck.

Once the grab had been recovered, the sample was checked for quality. Samples were rejected for poor quality for the following reasons:

- Uneven surface indicative of striking the seabed at an angle
- Washed out sample
- Disturbed surface sediment
- Contamination of the sediment (e.g. hagfish, paint chips, oil)
- Sample touching the top of the grab
- Sample <40 % of the grabs capacity

If a sample was deemed to be acceptable, a photograph was taken with a sample label in the image, indicating the sampling site and the drop number (Figure 4). A sediment sub-sample was taken from each of the grabs for particle size analysis (PSA) using a plastic scoop (approximately 200 g). The sample was sealed in two labelled ziploc bags.

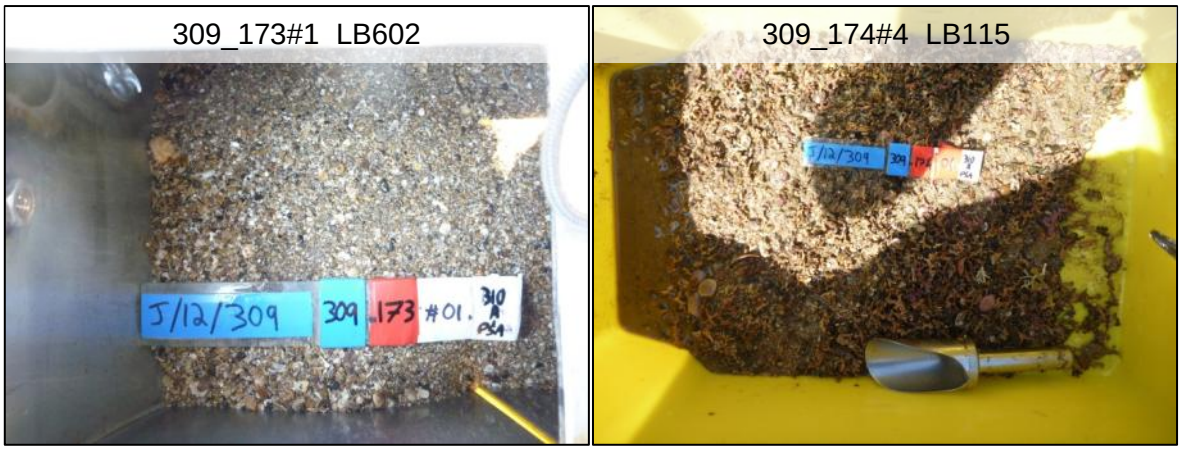


Figure 4. Example images of samples collected during Luce Bay benthic grab survey 2013

The remaining contents of the grab were washed into a collecting tray. The contents of the grab were gently washed over a 1 mm sieve. After washing, another photo was taken of the sediment in the sieve, again with a label clearly visible. The material retained on the sieve was transferred into labelled plastic containers for macrofaunal analysis. The macrofaunal samples were fixed using a 4 % buffered formaldehyde / seawater solution to prevent sample degradation. An internal label was added to the containers, before they were sealed with electrical tape.

At each station a fauna sample and a PSA sample were collected. Due to the low resolution of infaunal data available for Luce Bay it was most important to increase information on the general presence and distribution of biotopes, so the survey covered the widest possible area with single samples. Collecting replicate samples at each station to enable statistically robust comparisons of results would have substantially decreased the number of stations which could be visited in the limited time available. The only exception to this approach was station LB115, the targeted maerl bed: at this station three faunal samples were collected, in addition to a single PSA sample, to enable comparison of infaunal diversity to other maerl beds.

Macrofaunal, float and sediment samples were returned to Seastar Survey's laboratory in Southampton for sorting and analysis.

2.4. Survey limitations

2.4.1. Weather and environmental conditions

It was deemed unsafe for the vessel to conduct camera work in conditions where the sea state was moderate to rough with a swell greater than 1 m. At the mouth of the bay around The Scares there were very strong tidal currents. In order to keep the speed of the camera system over the ground low enough to obtain high quality video footage and still photographs, stations in this area could only be surveyed at slack water or on neap tides.

2.4.2. Available anchorages

The survey of the Luce Bay area was complicated by the lack of suitable anchorages for survey vessels. All anchorages within the bay itself are very small and tidally restricted. SV *Otarie* was operated out of both Kirkcudbright and Portpatrick. Portpatrick had the advantage of being a fully tidal harbour, but is very exposed to any westerly winds. Kirkcudbright marina is tidally restricted, limiting when the survey vessel could safely leave and enter, reducing potential survey hours. Luce Bay is very exposed, making anchoring within the Bay possible only on very calm weather days.

2.4.3. Camera connection issues

During the survey there were repeated camera connection problems, with video feed being lost when running survey lines. Despite replacing various pieces of camera kit, intermittent camera connection problems persisted throughout the survey. This had no impact on data quality, but delayed the rate at which sites could be sampled.

2.5. Video and photograph analysis

The analysis of the photographs and video records was carried out 'blind' without any prior knowledge of the sites, using a personal computer and software which allowed slow-motion, freeze frame and standard play analysis. An initial assessment of a station was carried out by first briefly examining photographs and video from that station to acquire a broad understanding of the substratum, flora and fauna. The video footage was viewed at 2x normal speed in order to divide the footage into segments representing different substrata. The start and end time and position of each segment were recorded. Brief changes in substrate type (i.e. less than one minute of video footage) were considered to be incidental patches and were not logged as discrete segments, but were recorded as part of the habitat description. More detailed analysis of the video footage was then undertaken. All still images were assessed with reference to the corresponding video clip, thus allowing each still image to be assessed with knowledge of the wider habitat in which it fell. The habitats and biotopes assigned to the video analysis were then cross-checked with the assessment of the still images, resulting in an on-going quality control process

Detailed video analysis consisted of a description of the seabed and the identification of flora and fauna to the lowest practical taxonomic level. The positions of any boundaries of different biotopes/habitats were determined using time codes and related back to the navigation data. General descriptions of the fauna were made and any other features of interest such as trawl marks were also recorded. The abundance data were recorded using the SACFOR scale. A list of the encountered fauna was produced for each site using species reference numbers as cited in the Marine Conservation Society Species Directory (Howson and Picton, 1997), with species nomenclature used as per the World Register of Marine Species (WoRMS Editorial Board, 2014). The video sections were subsequently

assigned a biotope according to the habitat and fauna present as per The Marine Habitat Classification for Britain and Ireland (Connor *et al*., 2004).

The still images were analysed to supplement and validate the video analysis, and to provide a more detailed analysis than could be extracted from the video footage. The still photography analysis was carried out using a personal computer. The methodology was similar to the video analysis methodology described above, and included a general seabed description. Substrata were described according to the Folk Trigon and Wentworth scale (see Leeder, 1982), with boulders and cobbles being described within 'gravel', and 'rock' referring to bedrock. As per the video analysis, fauna was identified to the lowest practical taxonomic level, and abundance data were recorded using the SACFOR scale. A list of the encountered fauna was produced for each photograph using species reference numbers as cited in the Marine Conservation Society Species Directory (Howson and Picton, 1997). Species nomenclature was as per WoRMS (WoRMS Editorial Board, 2014). Each still image was assigned a biotope according to the habitat and fauna present as per The Marine Habitat Classification for Britain and Ireland (Connor *et al*., 2004). Examples of seabed still photographs taken during the survey can be seen in Figure 5. These images display a selection of the different habitats observed.

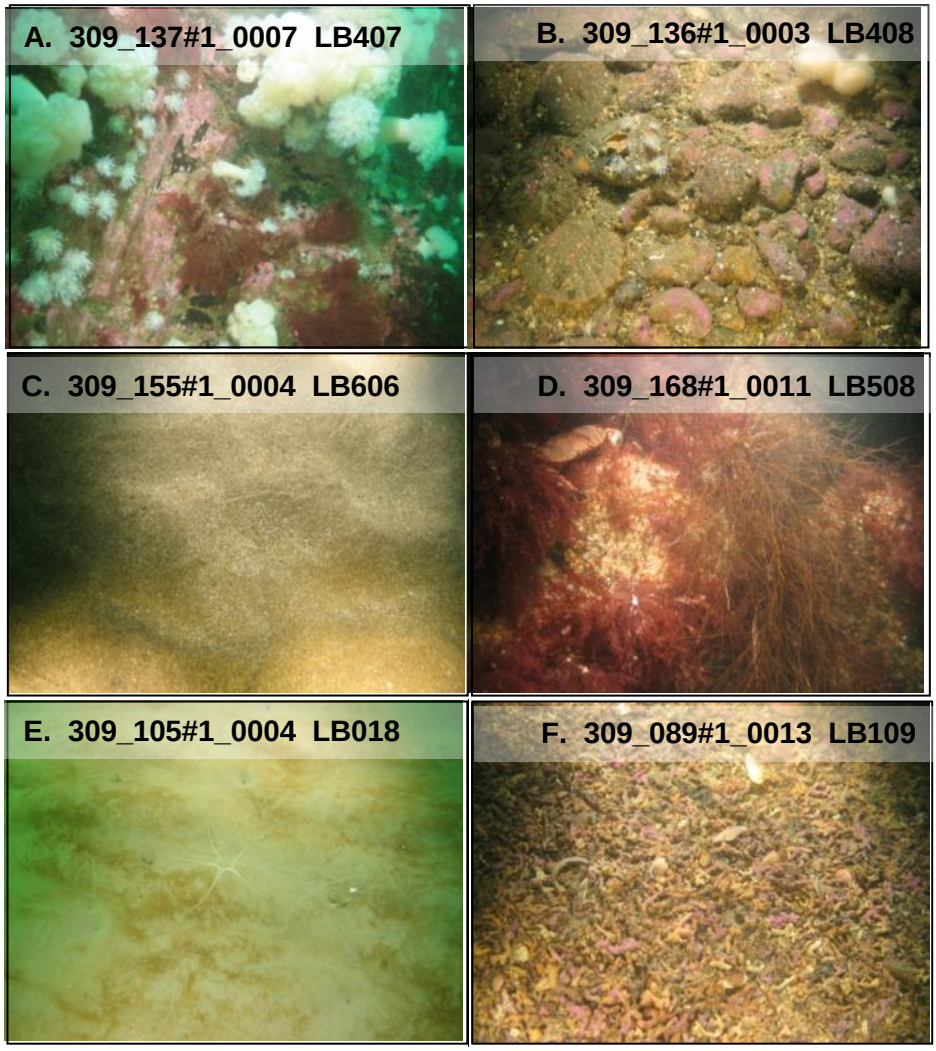


Figure 5. Example seabed photographs collected during the Luce Bay survey 2012. A. CR.HCR.FaT.MsenAct; B. CR.MCR.EcCr.FaAlCr.(Adig); C. SS.SCS.CCS; D. IR.MIR.KR.LhypTX; E. SS.SSa.IMuSa; F. SS.SMp.Mrl.Pcal

The species lists from the video and photograph analyses were combined to give a single complete species list from the drop-down camera survey. The final biotopes assigned to each station were a combination of those decided from the video analysis, but enhanced by the photo analysis i.e. where the still images provided information on fauna not identifiable during the video analysis, lower biotope levels could be applied to stations. The 'reefiness' of any potential Annex I reef biotopes were assessed according to Irving (2009). Appendix D shows the results of the video analysis.

2.6. Benthic grab sample analysis

2.6.1. Particle size analysis (PSA)

Particle Size Analysis (PSA) was completed in line with the appropriate quality assurance standards, as detailed by the National Marine Biological Analytical Quality Control Scheme, using wet and dry sieving. This comprised a nest of sieves ranging from 63 mm to < 0.063 mm (Wentworth scale) at half phi class intervals.

The dry weight of the sediment sample was determined and any muddy samples were disaggregated using a suitable method (e.g. sodium hexametaphosphate). The sample was then wet sieved on a 63 µm mesh to remove the mud, and then dried and re-weighed to establish the weight percentage of the sub 63 µm fraction. The remainder of the sample was then dry sieved with an appropriate sequence of mesh sizes to yield weight percentage data for particle size fractions at half phi intervals.

The particle size distribution has been described using the Folk Classification (Folk, 1954) and the Wentworth Classification system (Wentworth, 1922). Additional sediment statistics have been generated using the Gradistat programme (Blott and Pye, 2001) in order to examine, for example, sediment sorting and kurtosis.

2.6.2. Macrofaunal identification and enumeration

The processing of the macrofaunal sediment samples took place at Seastar Survey Ltd.'s laboratory in Southampton. Formalin was removed from the sediment samples by gentle re-sieving on 1 mm sieves. Any fauna present in the sample was sorted and picked out using trays and low-magnification microscopes. After all samples had been sorted, 10% of the samples were randomly selected to be re-sorted as a Quality Control procedure.

The picked fauna were subsequently enumerated and identified using appropriate keys and taxonomic literature to the lowest practical taxonomic level with reference to WoRMS (WoRMS Editorial Board, 2014) for species nomenclature. A MCS biocode according to Howson and Picton (1997) was also assigned to each taxa identified, where applicable.

A full list of taxa encountered and abundances per sample were recorded on a standard species / sample matrix. A reference collection was created whereby a representative specimen for each taxa / species identified was preserved in alcohol and stored in a glass sample vial with polyethylene closures. An internal Quality Control exercise was carried out to check the identification results.

A biotope was assigned to each grab station according to the Marine Biotope Classification for Britain and Ireland (Connor *et al*., 2004). The sediment type derived from the PSA results and the characteristic species identified from each sample were used to categorize the biotope for each sample. Where insufficient fauna were collected to adequately categorise a biotope, the sediment type from the PSA analysis was primarily used to assign a higher level biotope complex.

The biotopes derived from the benthic grab sampling were then compared to the biotopes assigned from the drop-down camera survey. The additional data from the infaunal species allowed for a more informed decision on the soft sediment biotopes, allowing for classification to lower biotope levels than were possible from the drop-down camera data alone.

2.6.3. Statistical analysis of macrofaunal data

Faunal abundances from sediment samples are expressed as the number of individuals per 0.1 m^2. The data analyses comprised both univariate and multivariate analyses, all of which were calculated using PRIMER (Plymouth Routines in Multivariate Ecological Research) v.6 (Clarke and Warwick, 2001). The univariate analysis included the total number of individuals (N), total number of species (S), species diversity as measured by the Shannon-Wiener (H'), Pielou's (J), Margalef's (d) diversity and Simpson's Dominance indices (see e.g. Gage and Tyler, 1991; Fowler and Cohen, 1992; Clarke and Warwick, 1994, 2001). The Shannon-Wiener index was calculated using the natural log ($\log_e$).

The multivariate analyses were carried out using cluster analysis and ordination (non-metric multi-dimensional scaling, MDS). The data were standardised (to allow for different sample volumes) but not transformed, as the abundances of the species present were generally similar across the stations. The only exception was the high abundance of *Spirobranchus* sp. at a number of stations. Detailed analysis of the data, including different types of transformations, resulted in similar but unclear trends, suggesting small differences between the stations overall. These results, together with the low abundance for most taxa across the sample stations, meant that the use of any type of transformation was considered inappropriate for the macrofaunal data.

The cluster analysis, or hierarchical agglomerative clustering, describes a process where similar samples are fused into larger and larger groups. This grouping was based on group-averaging or nearest neighbour sorting of a matrix of samples' similarities, using the Bray-Curtis similarity measure. The results were displayed in a tree-like dendrogram. The cluster analysis was used in conjunction with Multi-Dimensional Scaling (MDS) or ordination analysis, thus allowing a check on the 'goodness of fit' of the clusters produced by both types of analyses.

A SIMPROF analysis was run in parallel with the Cluster analysis. The SIMPROF analysis allows the identification of 'true' groupings by testing for evidence of structure in an *a priori* unstructured set of samples. In combination with clustering this was used to generate dendrograms that illustrated objectively-defined groups.

The SIMPER routine in PRIMER was subsequently used to assess the differences in characteristic species / taxa in the sample clusters.

3. RESULTS

3.1. Drop-down camera survey

During the drop-down camera survey a total of 38 biotopes were observed. Table 2 lists the biotopes observed and the frequency of occurrence, whilst Figure 6 shows the distribution of the biotopes. A full biotope inventory can be found in Appendix E. A total of 178 different taxa were observed from the analysis of the video footage and still images (see Appendices D and F). Brief descriptions and example images of the habitats observed at each station have been included in Appendix G.

Table 2. Biotopes observed during the drop-down camera survey in Luce Bay, 2012.

Biotope	Description	No. of records
CR.HCR.FaT.(CTub)	Very tide-swept faunal communities with small clumps of *Tubularia indivisa*	1
CR.HCR.FaT.MsenAct	Suggested new biotope – *Metridium senile* and *Actinothoe sphyrodeta* on vertical circalittoral rock	1
CR.HCR.XFa	Mixed faunal turf communities	5
CR.HCR.XFa.(ByErSp)	Mixed faunal turf communities, with some characteristic bryozoans but lacking erect sponge component of full biotope	1
CR.HCR.XFa.(FluCoAs.X)	Mixed faunal turf communities, including some *Flustra foliacea,* on tide-swept exposed circalittoral mixed substrata	1
CR.HCR.XFa.ByErSp	Bryozoan turf and erect sponges on tide-swept circalittoral rock	1
CR.HCR.XFa.ByErSp. DysAct	Mixed turf of bryozoans and erect sponges with *Dysidea fragilis* and *Actinothoe sphyrodeta* on tide-swept, wave-exposed circalittoral rock	2
CR.HCR.XFa.FluCoAs. SmAs	*Flustra foliacea*, small solitary and colonial ascidians on tide-swept circalittoral bedrock or boulders	1
CR.HCR.XFa.SpNemAdia	Sparse sponges, *Nemertesia* spp. and *Alcyonidium diaphanum* on circalittoral mixed substrata	1
CR.MCR.EcCr.FaAlCr	Faunal and algal crusts on exposed to moderately wave exposed circalittoral roc.	4
CR.MCR.EcCr.FaAlCr. (Adig)	Faunal and algal crusts on exposed to moderately wave exposed circalittoral rock, with some *Alcyonium digitatum*	1
CR.MCR.EcCr.FaAlCr.Bri	Brittlestar bed on faunal and algal encrusted, exposed to moderately wave-exposed circalittoral rock	1
CR.MCR.EcCr.FaAlCr.Flu	*Flustra foliacea* on slightly scoured silty circalittoral rock	1
CR.MCR.EcCr.(UrtScr)	Echinoderms and crustose red algae, with some *Urticina felina*	1
CR.MCR.EcCr.UrtScr	*Urticina felina* and sand-tolerant fauna on sand-scoured or covered circalittoral rock	1
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock	2
IR.HIR.KSed	Sand or gravel-affected or disturbed kelp and seaweed communities	9

Biotope	Description	No. of records
IR.HIR.KSed.(DesFilR)	Sand or gravel-affected or disturbed kelp and seaweed communities, with some *Desmarestia* spp.	2
IR.HIR.KSed.(LsacChoR)	Sand or gravel-affected or disturbed kelp and seaweed communities, with some *Chorda filum*	2
IR.HIR.KSed.(XKScrR)	Sand or gravel-affected or disturbed kelp and seaweed communities, with some scour resistant red algae species	1
IR.HIR.KSed.XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock	2
IR.HIR.KSed.LsacSac	*Laminaria saccharina* and/or *Saccorhiza polyschides* on exposed infralittoral rock	1
IR.MIR.KR.Ldig.Pid	*Laminaria digitata* and piddocks on sublittoral fringe soft rock	1
IR.MIR.KR.LhypTX	*Laminaria hyperborea* on tide-swept, infralittoral mixed substrata	3
SS.SCS.CCS	Circalittoral coarse sediment	30
SS.SCS.ICS	Infralittoral coarse sediment	5
SS.SCS.ICS.SSh	Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles), with little obvious fauna.	1
SS.SMp.KSwSS.LsacR	*Laminaria saccharina* and red seaweeds on infralittoral sediments	1
SS.SMp.Mrl.(Lgla)	Encrusting *Lithothamnion glaciale* maerl beds. No rhodoliths present	2
SS.SMp.Mrl.(Pcal)	Coarse gravel, with a small component of dead *Phymatolithon calcareum*	1
SS.SMp.Mrl.Pcal	*Phymatolithon calcareum* maerl beds in infralittoral clean gravel or coarse sand	12
SS.SMx.CMx	Circalittoral mixed sediment	4
SS.SMx.CMx.(FluHyd)	Transition between SS.SCS.CCS and SS.SMx.CMx.FluHyd	1
SS.SMx.CMx.FluHyd	*Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment	5
SS.SMx.IMx	Infralittoral mixed sediments	12
SS.SSa.CMuSa	Circalittoral muddy sand	12
SS.SSa.IFiSa.(ScupHyd)	Infralittoral fine sand. Sparse pebbles / cobbles with *Flustra foliacea* and *Alcyonidium diaphanum*	1
SS.SSa.IMuSa	Infralittoral muddy sand	8

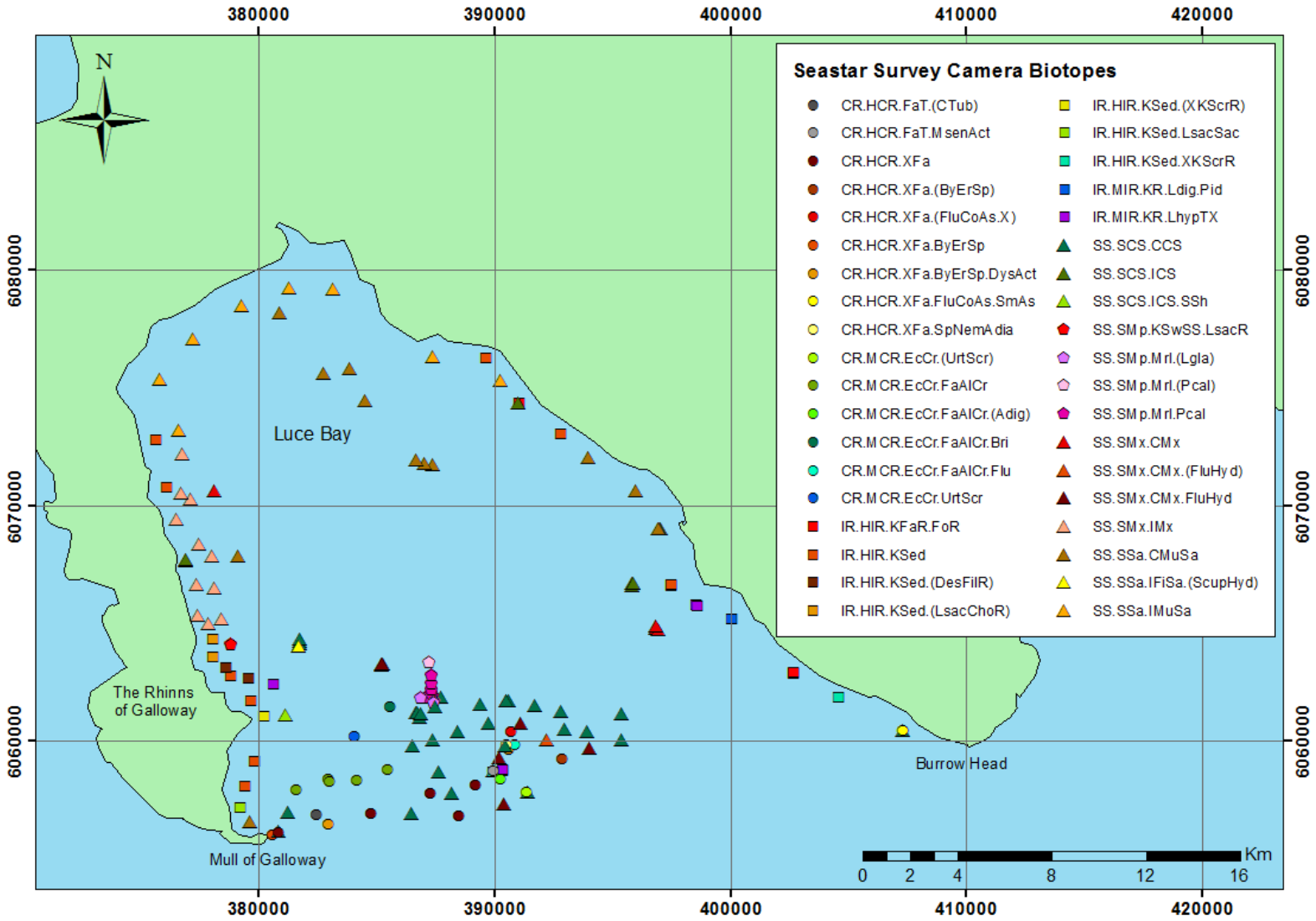


Figure 6. Distribution of biotopes from the drop-down camera survey of Luce Bay 2012© Crown copyright and database rights [2014] Ordnance Survey 100017908.

3.1.1. Summary of biotope distribution

Brief descriptions of the habitats observed within four broad regions of Luce Bay are included below. Please see Appendix G for a more detailed summary of the habitats present at each station investigated.

3.1.1.1. Head and centre of Luce Bay

The head and centre of Luce Bay (stations LB007 – LB009 and LB014 – LB021) were dominated by muddy-sand habitats (**SS.SSa.CMuSa** and **SS.SSa.IMuSa** biotopes; stations LB013 – LB021). These habitats were characterised by high numbers of infaunal burrows and brittlestars (*Ophiura* spp.). Other fauna seen included the mollusc *Scaphander lignarius*. The shallower stations at the head of the bay (**SS.SSa.IMuSa**; LB016 – LB020) had large amounts of organic matter covering the surface of the sediment. Feeding trails and some faecal mounds could also be seen on the surface of the sediment (Figure 7).

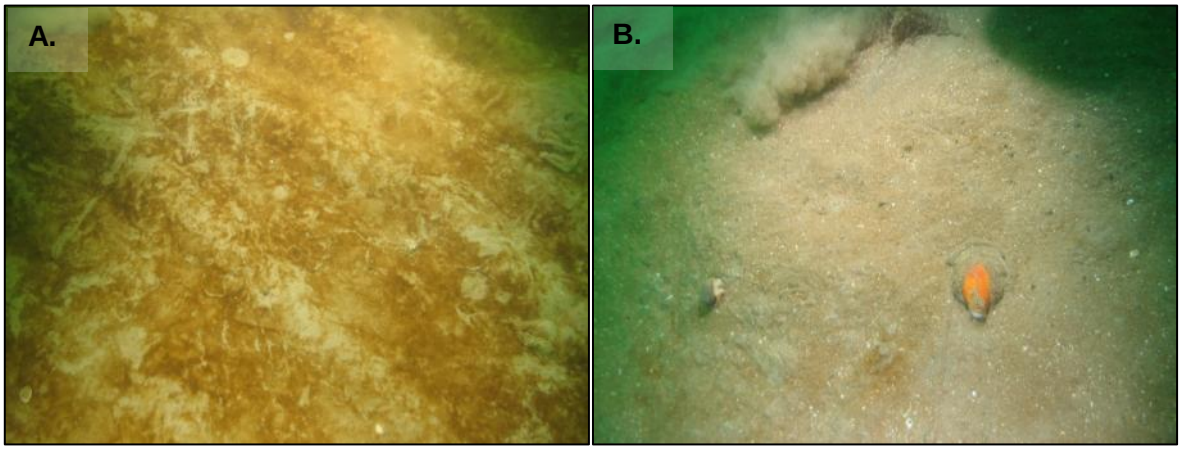


Figure 7. Example images of muddy-sand biotopes from the head of Luce Bay. A. ***SS.SSa.IMuSa*** *with high degree of surface organic content, LB020; B.* Scaphander lignarius, *LB516.*

3.1.1.2. Western coastline

The western coastline was represented by stations LB 001 – LB003, LB022, LB201 – LB215 and LB306 – LB317. The north-western coastline comprised mainly coarse mixed sediment habitats (**SS.SMx.IMx** and **SS.SMx.CMx** biotopes), with some kelp and algae on cobbles and rock in the shallower stations. The mixed sediments included fine soft sediment, with some gravel and shell material (Figure 8). Some of the stations represented a transition between mixed and muddy-sand biotopes, containing features characteristic of both biotopes such as sand waves and infaunal burrows, but also a degree of gravel and shell material. Some sites were characterised by large amounts of dead gastropod shells, some of which had been exploited by pagurid hermit crabs. Sparse amounts of red algae, bryozoans and hydroids were sometimes attached to the occasional pebble. Other fauna present included *Ophiura* spp., *Chaetopterus* worm tubes and galatheid squat lobsters.

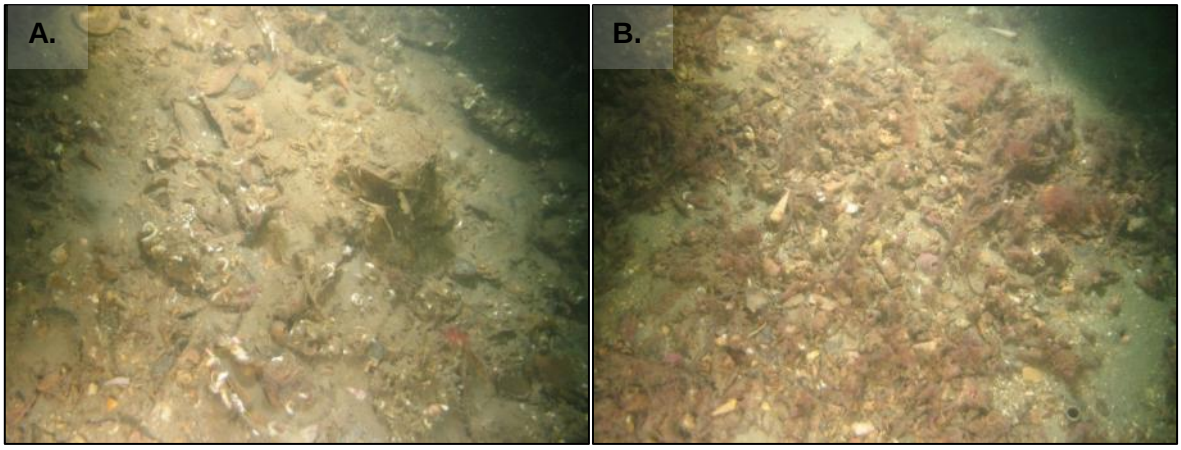


Figure 8 Example images of mixed sediment biotopes. A. LB201; B. LB317.

Towards the south-western part of the bay infralittoral rock habitats were more frequently observed. These were generally part of the 'sand or gravel-affected or disturbed kelp and seaweed' biotope complex (**IR.HIR.KSed**) (Figure 9). The various red and brown algal species were difficult to identify with accuracy to species level from the video and still images, so many of the biotopes have only been assigned tentatively. This uncertainty has been reflected by placing the level 5 biotope code part in brackets (e.g. **IR.HIR.KSed.(LsacChoR)** etc.). The algae were often colonised by patches of the colonial ascidian *Diplosoma listerianum*. Another ascidian, *Dendrodoa grossularia*, was frequently seen under the algal cover. The hard rock surfaces had some faunal turf covering, with barnacles and serpulid tube worms also present.

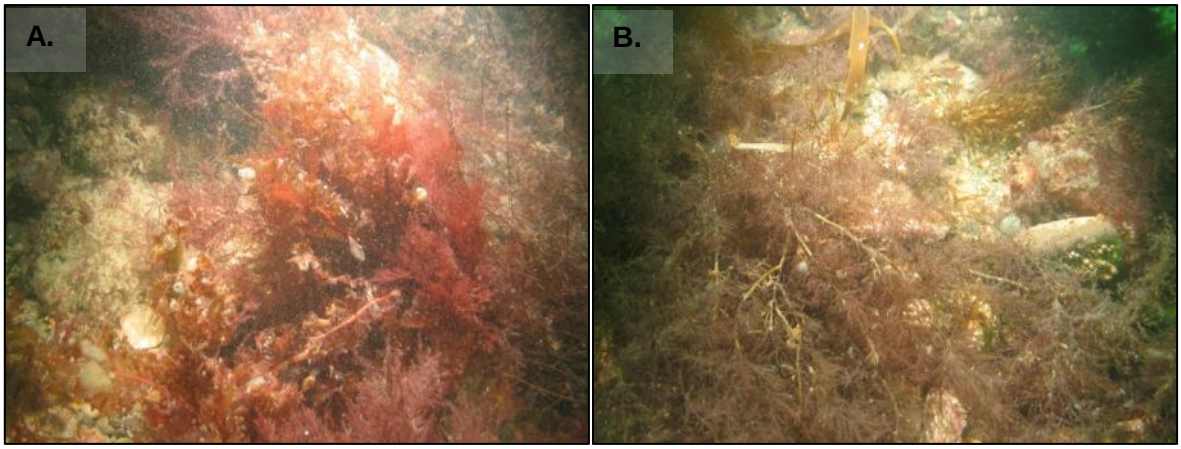


*Figure 9. Example images of **IR.HIR.KSed** biotopes from the south-western coastline. A. LB305; B. LB318.*

3.1.1.3. Mouth of Luce Bay

The stations LB101 – LB122, LB301 – LB305, LB401 – LB425 and LB601 – LB610 were located broadly within the mouth of Luce Bay. The mouth of the bay was characterised by coarse sand and gravel (**SS.SCS.CCS**), with some transition into hydroid and bryozoan dominated mixed sediment habitats (**SS.SMx.CMx.FluHyd**) (Figure 10). Some of these stations had fauna characteristic of one biotope, whilst the substrate was more characteristic of a different biotope. In these cases, the biotopes were assigned based on the fauna observed rather than the sediment type. The coarse sediment habitats included large amounts of dead shell material, sometimes formed into discrete bands over the sediment.

Fauna was typically sparse on the coarse sands, becoming more abundant as the fraction of larger sized sediment particles increased. Various species of bryozoans, including *Flustra foliacea* and *Alcyonidium diaphanum*, hydroids, and the anemone *Urticina* sp. were seen frequently.

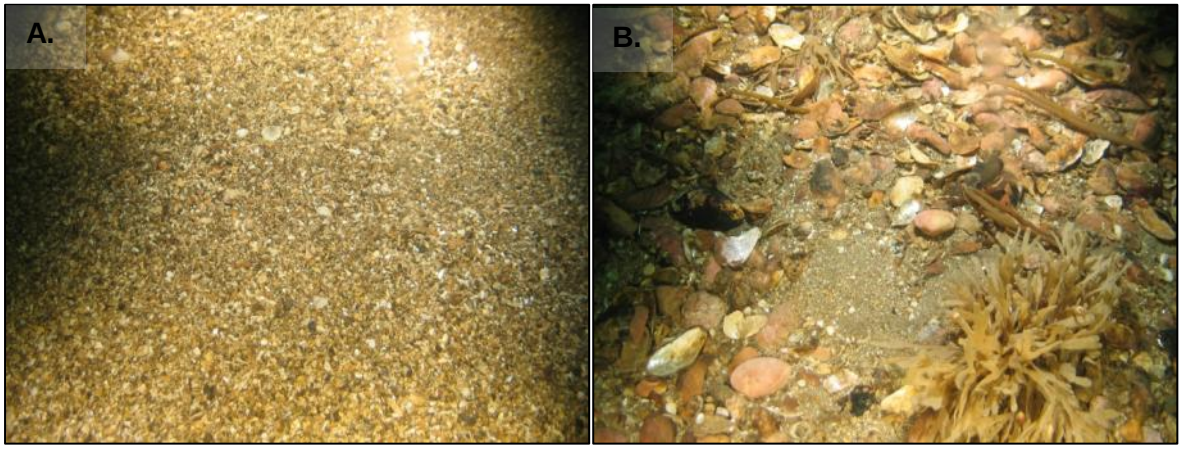


Figure 10. Example images of coarse sediment habitats at the mouth of Luce Bay. A. LB602; B. LB604.

Around the Scares and off the Mull of Galloway a range of circalittoral rock biotopes were found, either part of the 'mixed faunal turf communities' biotope complex (**CR.HCR.XFa**) or 'echinoderms and crustose communities' complex (**CR.MCR.EcCr**). In general, the rock communities were composed of cobbles and pebbles, with encrusting red algae or faunal turfs. Some of the highest faunal diversities observed during the drop-down camera survey were found on these circalittoral rock biotopes (Figure 11). For example a wide range of sponges, bryozoans, anemones and hydroids were seen in the **CR.HCR.XFa.ByErSp.DysAct** biotope, in addition to a range of mobile macrofauna such as *Necora puber, Echinus esculentus* and *Asterias rubens*. A brittlestar bed composed of *Ophiocomina nigra* and *Ophiothrix fragilis* was found at LB413 (**CR.MCR.EcCr.FaAlCr.Bri** biotope). These rock biotopes were characteristic of the Annex I Reefs habitat under the 'stony reefs' category. A maerl bed was found in the centre of the bay mouth, and is discussed in more detail in section 3.1.2.

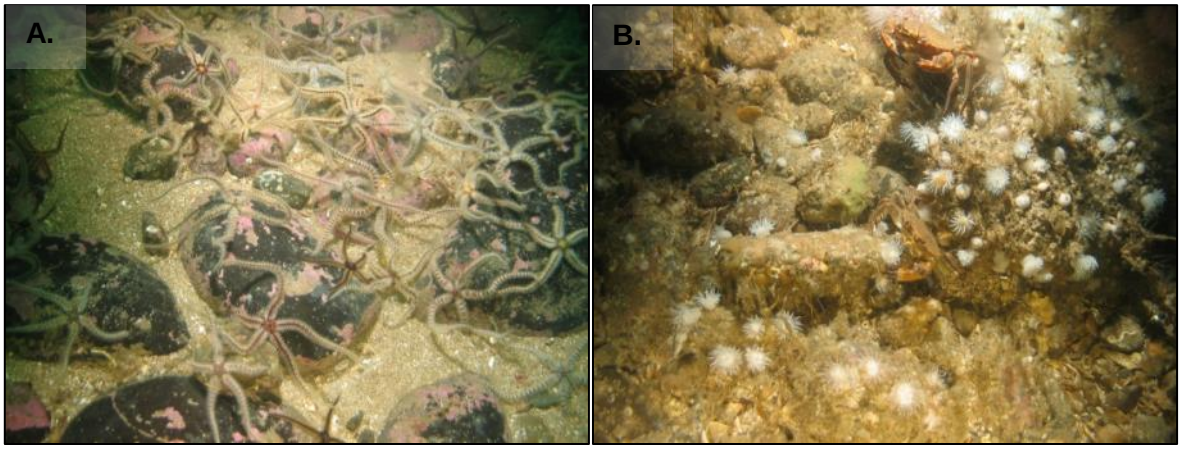


Figure 11. Example images of circalittoral rock biotopes fom the mouth of Luce Bay. A. ***CR.MCR.EcCr.FaAlCr.Bri****, LB413; B.* ***CR.HCR.XFa.ByErSp.DysAct****, LB420.*

3.1.1.4. Eastern Coastline

The eastern coastline area was represented by stations LB508 – LB521, LB004 – LB006, and LB010 – LB011. The eastern coastline had some infralittoral rock biotopes towards the south-east and north- east, with a range of kelp and red algae present. As with the north-western coastline, these habitats were generally part of the **IR.HIR.KSed** biotope complex, with exact identification of the various algae difficult to ascertain from the video and still images (Figure 12). At station LB509 piddock bored soft rock was observed, with a cover of gravel and cobbles colonised by red algae and kelp (**IR.MIR.KR.Ldig.Pid**). An area of muddy-sand was found at the mid-eastern coastline, with infaunal burrows and *Ophiura* spp. present.

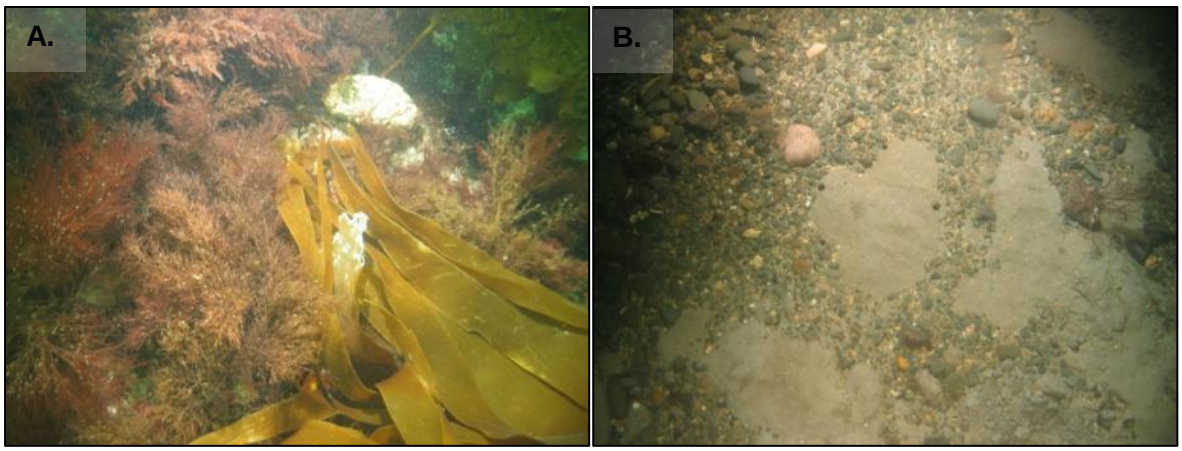


Figure 12. Example images from the eastern coast of Luce Bay. A. ***IR.HIR.KSed****, LB511; B.* ***IR.MIR.KR.Ldig.Pid****, LB509.*

Figures 13 – 15 show more detailed maps of the biotope distributions at the head of Luce Bay, the western and eastern coastlines, and at the mouth of the bay.

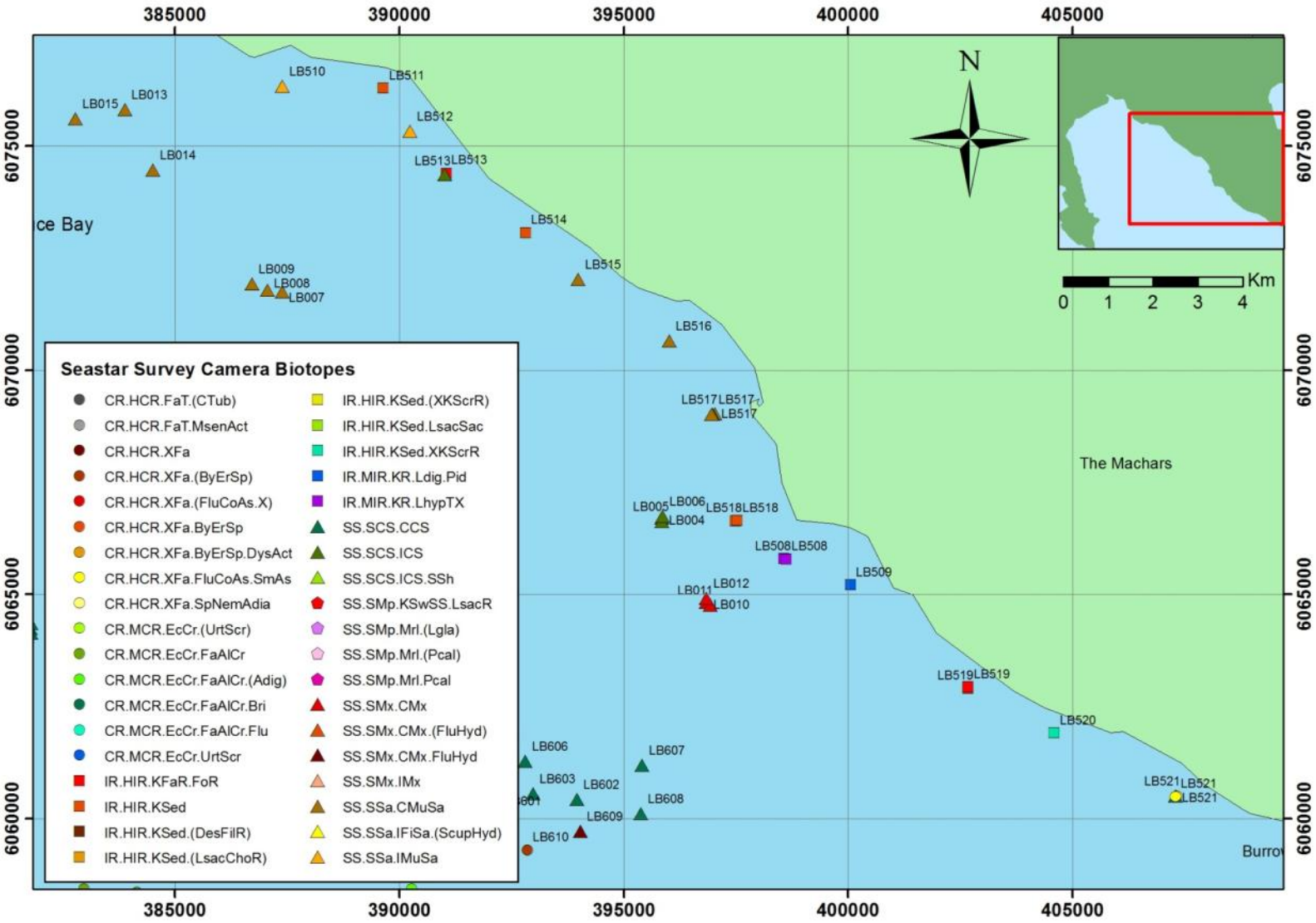


Figure 13. Map showing the distribution of camera biotopes on the eastern coastline of Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

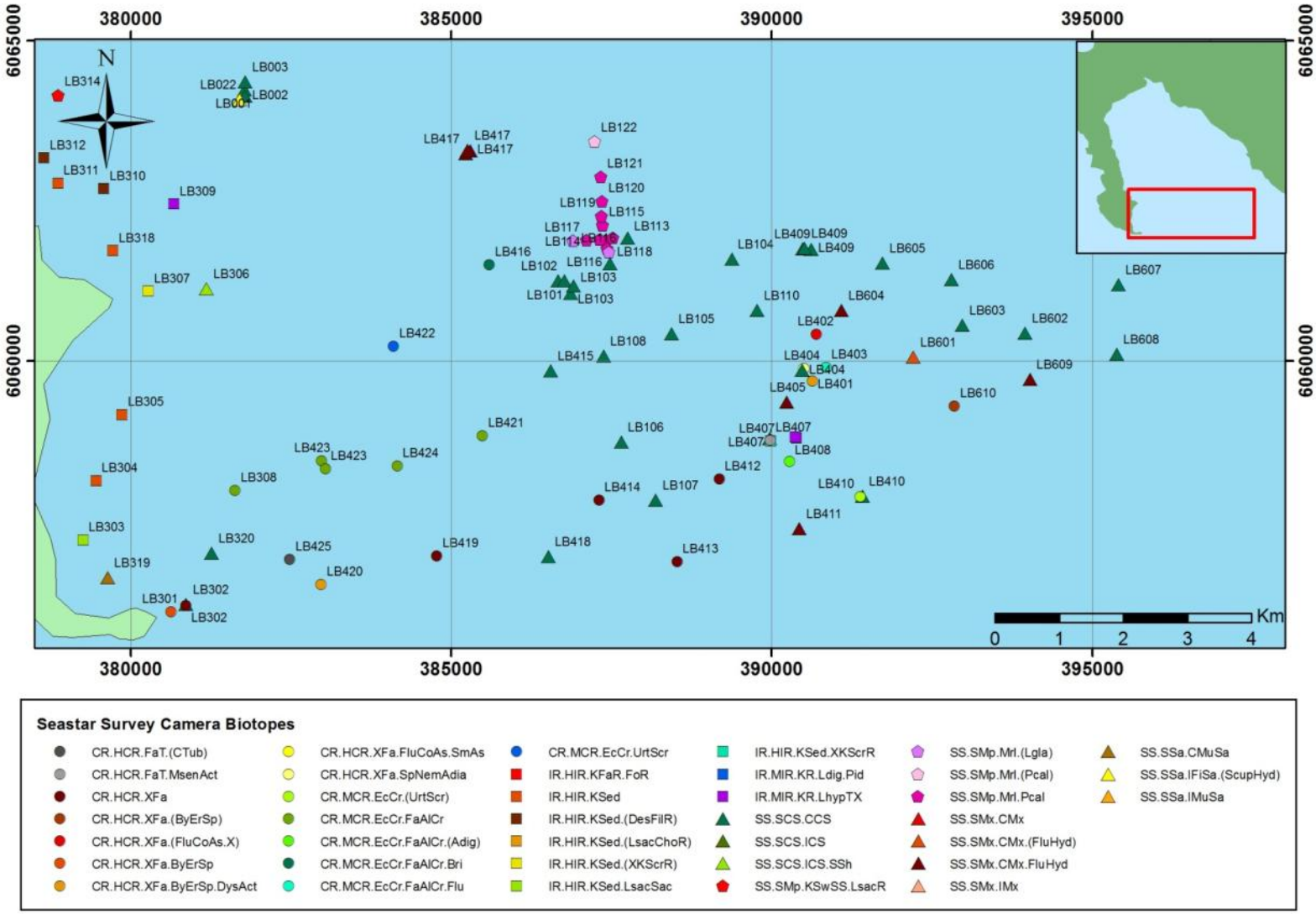


Figure 14. Map showing the distribution of camera biotopes from the mouth of Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

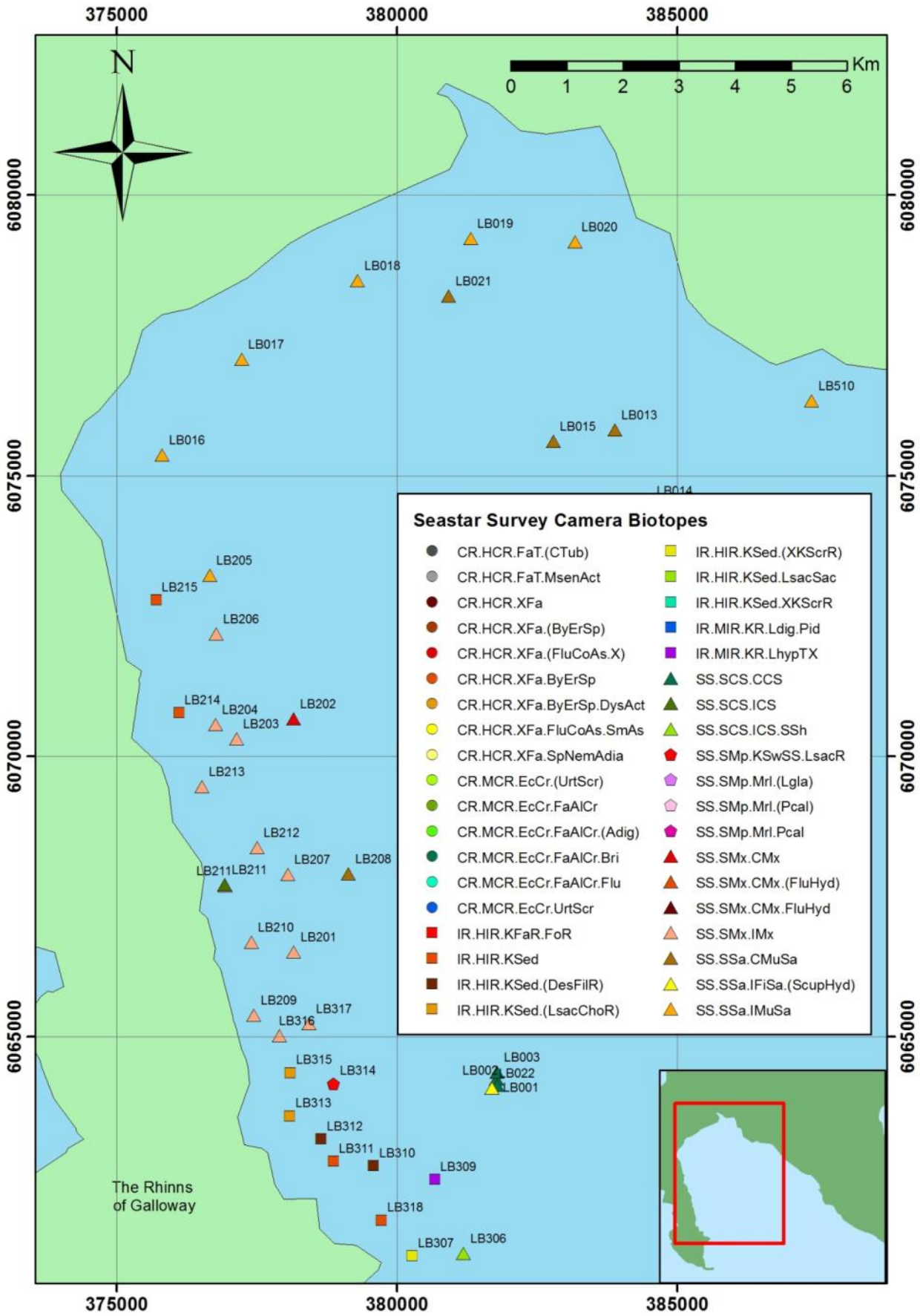


Figure 15. Map showing the distribution of camera biotopes on the western coastline of Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

3.1.2. Maerl bed

An area of maerl was observed at station LB109. In order to delimit the full extent of the maerl bed, further camera stations were located in a cruciform pattern, with LB109 as the centre point. Distance between the stations was increased with distance from the centre point, and further stations were added until no more maerl was seen in each direction. A total of 13 camera stations were sited to define the maerl bed boundaries. Figure 16 shows the video tracks and the biotopes present at these stations.

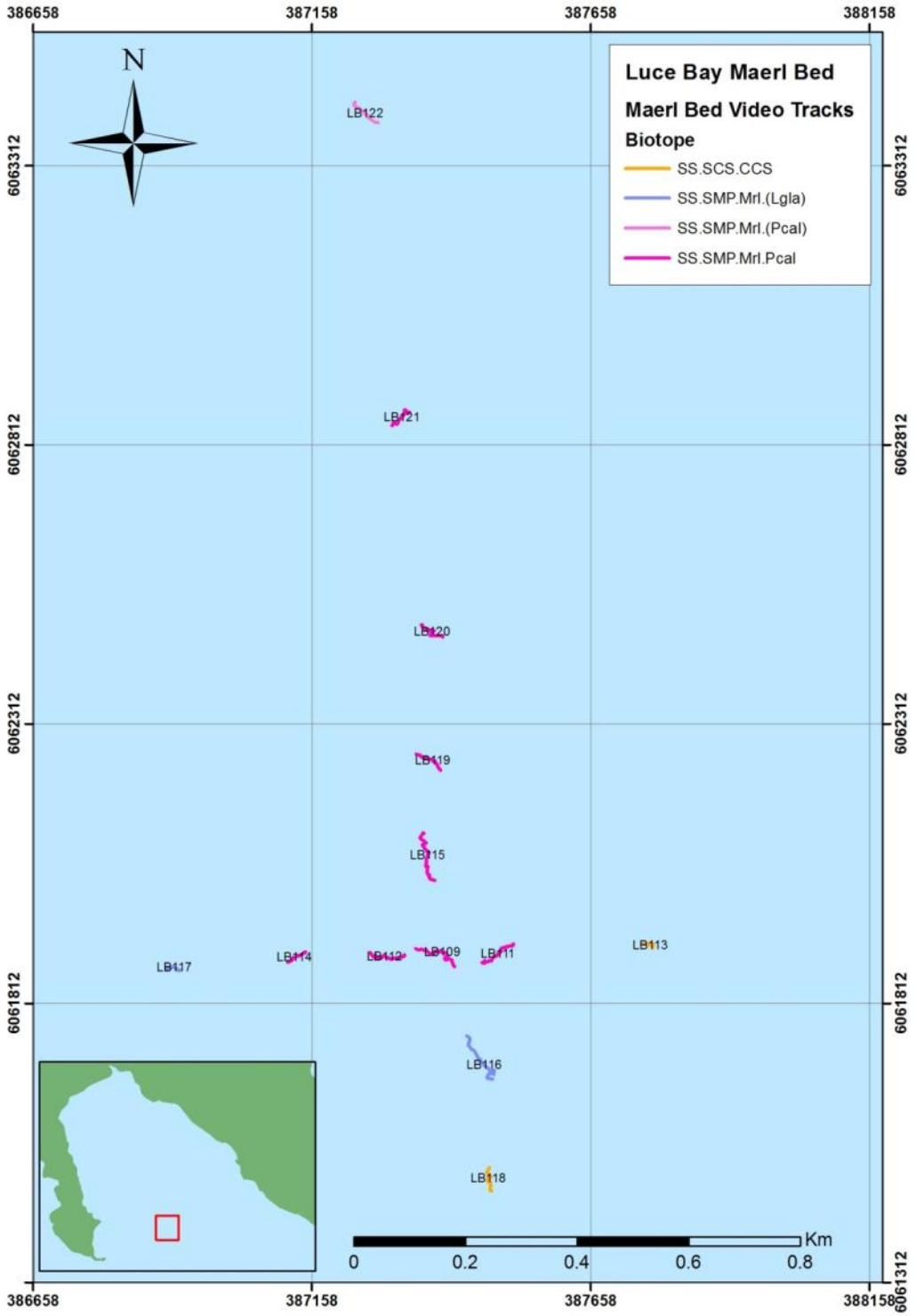


Figure 16. Video tracks and still photograph positions investigating the maerl bed in Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

The maerl bed was characterised by the presence of *Phymatolithon calcareum*. A large proportion of the maerl present was dead skeletons, although some live maerl was observed. Figure 17 shows the percentage cover of live *P. calcareum* estimated according to the SACFOR scale from the still photographs taken.

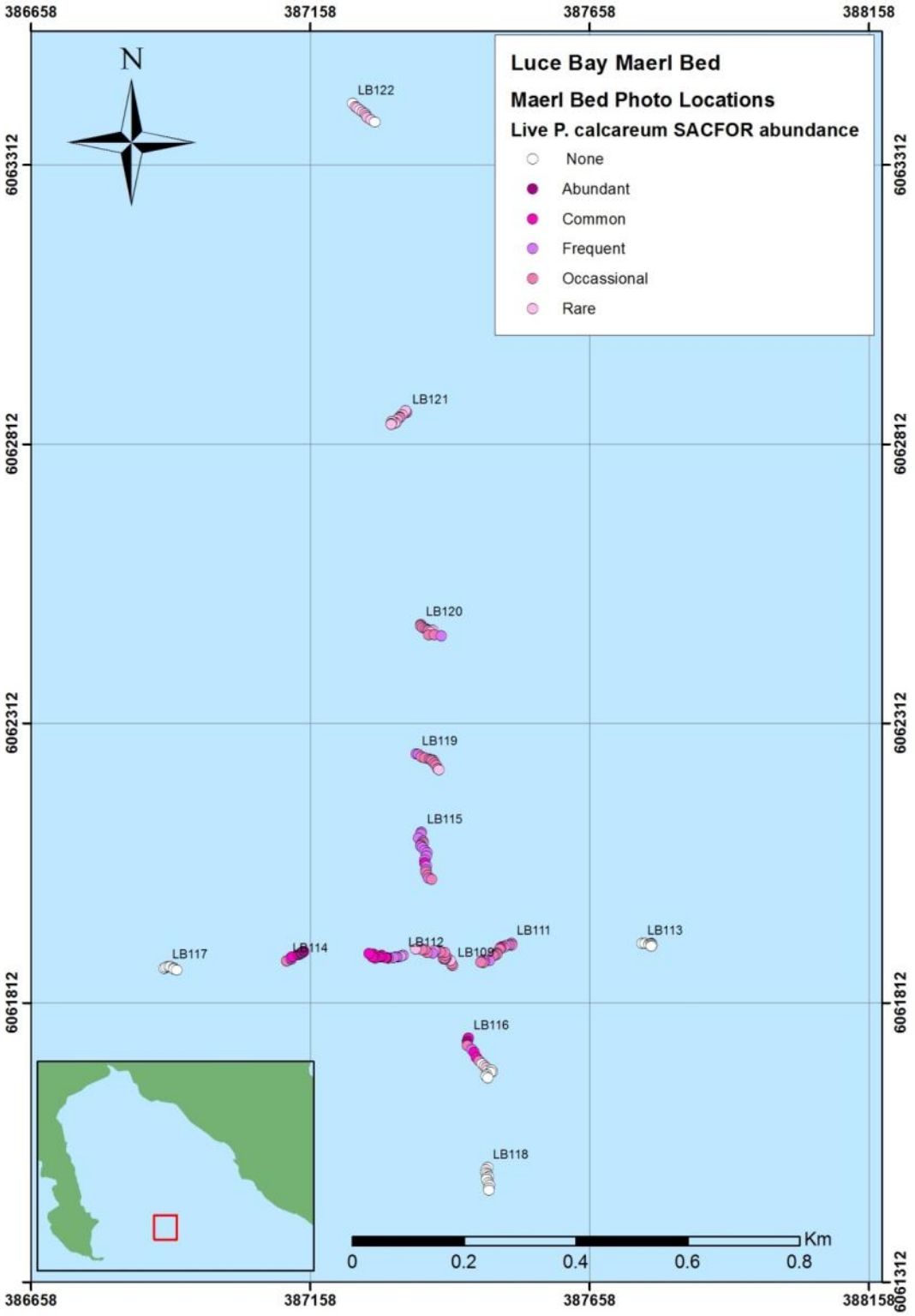


Figure 17. SACFOR abundance of live Phymatolithon calcareum *estimated from still photographs. © Crown copyright and database rights [2014] Ordnance Survey 100017908.*

The highest percentages of living maerl were found between station LB116 in the south, LB119 in the north, LB114 to the west and LB111 in the east. Outside of this rough area the observed percentage cover of live maerl was always lower than 10 % and often less than 5%. At the outer edges of the area investigated, the seabed was characterised by coarse gravel and shell material. Some of the gravel was encrusted by another pink algal species, *Lithothamnion glaciale*, which under certain conditions can form maerl rhodoliths as well. Some dead skeletons of *Phymatolithon calcareum* were also present in the northern most station (LB122).

The majority of the stations were best described by the '*Phymatolithon calcareum* maerl beds in infralittoral clean gravel or coarse sand biotope' (**SS.SMp.Mrl.Pcal**). The spatial complexity created by the maerl still existed despite the majority of the maerl being dead. Towards the boundary of the maerl bed the abundance of *P. calcareum* (both dead and alive) dropped, with an increase in encrusting *Lithothamnion glaciale* seen on the gravel. Where the percentage cover of *L. glaciale* exceeded that of *P. calcareum*, the biotope **SS.SMp.Mrl.(Lgla)** was assigned. This designation marked the presence of *L. glaciale*, but the lack of *L. glaciale* 'rhodoliths' and the fully saline conditions at these sites meant that it was inappropriate to assign the level 5 biotope part **.Lgla** without placing it in parentheses. Stations where very few dead *P. calcareum* skeletons were present in gravel (station LB122) were assigned the biotope **SS.SMp.Mrl.(Pcal).** This reflects presence of maerl gravel at the location, but it was sparse and widely interspaced among gravel and muddy-sand. Stations LB118 and LB113 had no maerl present, and were beds of coarse gravel (**SS.SCS.CCS** biotope).

The maerl was present along with large numbers of dead bivalve shells and gravel over a muddy-sand substratum. Few faunal species were observed on the drop-down camera footage – the high diversity associated with maerl beds typically comes from a wide variety of interstitial organisms. Sampling the maerl areas using a grab is therefore essential to gain a thorough understanding of the community present within the maerl bed. Typical species identified from the video footage and still images included *Asterias rubens*, *Gibbula cineraria*, *Lanice conchilega, Ebalia* sp., some clumps of various hydroid species and the anemone *Urticina felina.* At the edges of the maerl bed where gravel began to dominate *Cerianthus lloydii* was common, as was the bryozoan *Alcyonidium diaphanum.* Figure 18 shows example photographs from around the maerl bed.

3.1.3. Annex I habitats

Two potential Annex I habitats were observed during the drop-down camera survey. The areas of sand in the middle and head of the bay could have been representative of the habitat 'Sandbanks which are slightly covered by sea water all the time'. Without better bathymetric data it was not possible to assess the height of any potential sandbanks in the bay, so the record of this habitat is uncertain. Although depth was measured using the vessel's echosounder, full assessment of such features requires a more precise bathymetric survey.

Stony reef habitats were observed at the mouth of Luce Bay. A total of 20 stations were categorised as stony reef habitats. All of these stations were characterised by high levels of epifauna and mobile megafauna such as *Asterias rubens* and *Echinus esculentus*. The substratum varied from being mainly cobbles to accumulations of pebbles with occasional cobbles. These stations are summarised in Table 3, with reefiness assessed according to Irving (2009).

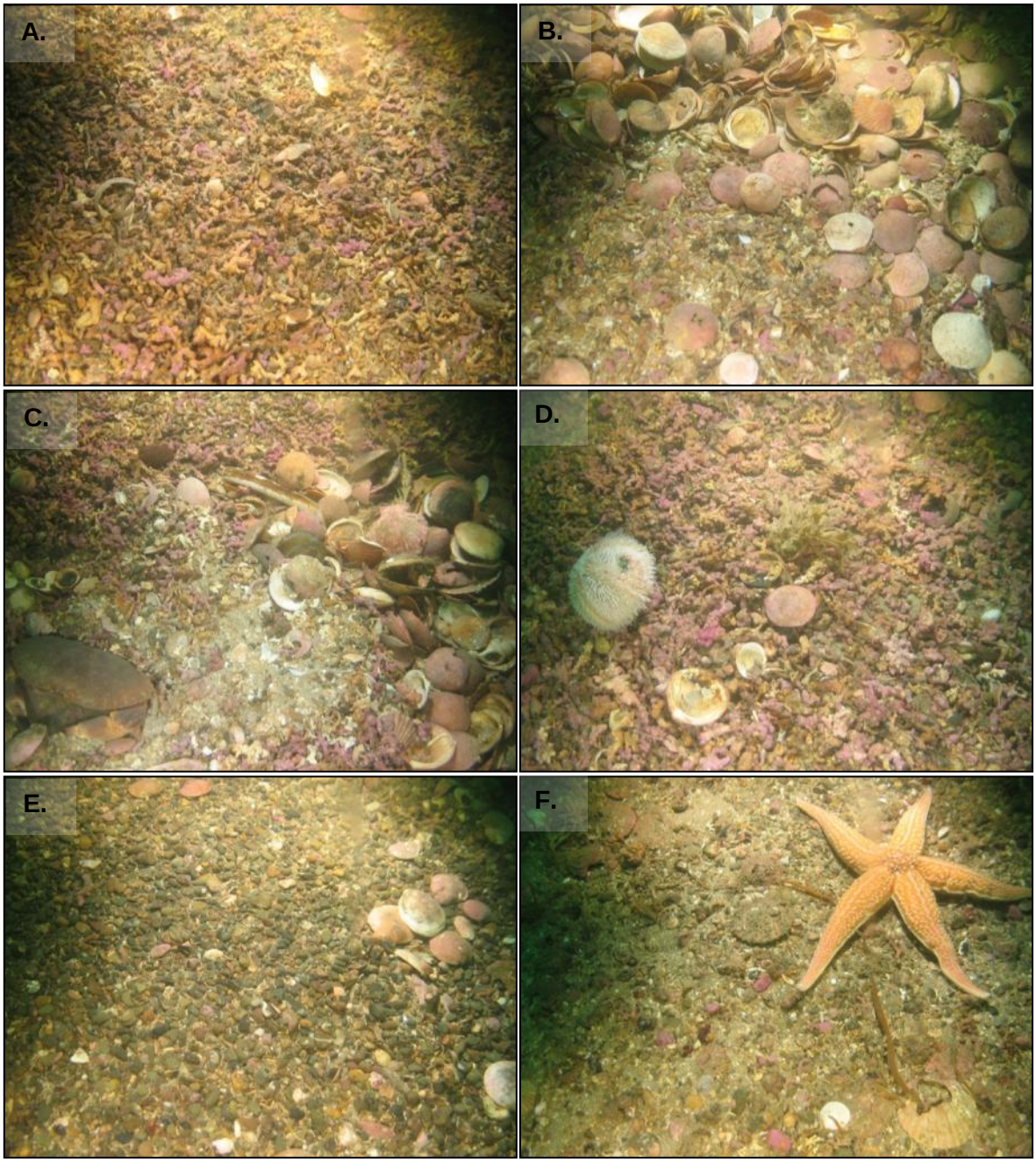
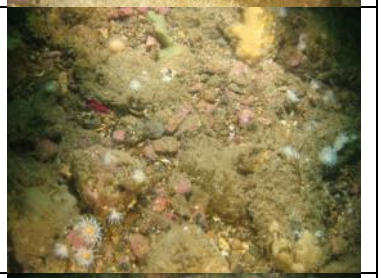
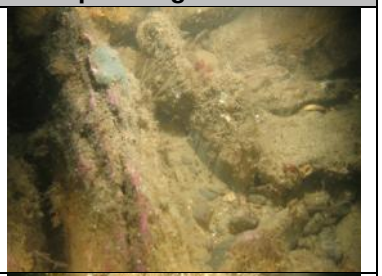


Figure 18. Example still photographs of the maerl bed. A. Dense covering of dead and live maerl (LB109); B. Areas of dead bivalve shells (LB111); C. Maerl and dead shells with Cancer pagurus *(LB112); D. Large quantities of live maerl (LB114); E. Coarse gravel outside the maerl bed (LB113); F. Gravel over muddy-sand with some encrusting* Lithothamnion glaciale *at the boundary of the bed (LB122).*

Table 3. Annex I stony reef habitats identified from drop-down camera survey in Luce Bay, with an assessment of 'Reefiness' according to Irving (2009).

Station	Biotope	Substrata	Biological community	'Reefiness'	Example image
LB301	CR.HCR.XFa.ByErSp	Cobbles, pebbles	Bryozoans, hydroids, anemones, sponges, faunal turf, *Asterias rubens, Crossaster papposus*, barnacles	Medium	
LB308	CR.MCR.EcCr.FaAlCr	Cobbles, pebbles, sand patches	Encrusting red algae, *Echinus esculentus, Flustra foliacea,* anemones, *Nemertesia sp.*, hydroids, bryozoans	Medium	
LB401	CR.HCR.XFa.ByErSp.DysAct	Cobbles, pebbles	Faunal turf, various sponges, *Actinothoe spyrodeta*, asteroids, hydroids, bryozoans, anemones, *Cancer pagurus, Necora puber*	Medium	
LB402	CR.HCR.XFa.(FluCoAs.X)	Cobbles, pebbles, some sand covering	Encrusting red algae, *Echinus esculentus*, colonial ascidians, sponges, anemones, faunal turf, hydroids, bryozoans	Low	

Station	Biotope	Substrata	Biological community	'Reefiness'	Example image
LB403	CR.MCR.EcCr.FaAlCr.Flu	Boulders, cobbles, silty sand covering	Sponges, *Flustra foliacea*, faunal turf, encrusting red algae, *Nemertesia sp.*	Medium	
LB404	CR.HCR.XFa.SpNemAdia	Pebbles and gravel	*Alcyonidium diaphanum*, *Nemertesia sp.*, hydroids, *Cerianthus lloydii*, *Flustra foliacea*	Low	
LB408	CR.MCR.EcCr.FaAlCr.(Adig)	Cobbles, some sand covering	Encrusting red algae, *Alcyonium digitatum, Actinothoe spyrodeta, Echinus esculentus*, hydroids, *Calliostoma ziziphynum*, sponges	Medium	
LB410	CR.MCR.EcCr.(UrtScr)	Cobbles, pebbles, shell material	*Urticina felina*, *Crossaster papposum*, encrusting red algae, serpulid tubes, *Echinus esculentus*	Medium	

Station	Biotope	Substrata	Biological community	'Reefiness'	Example image
LB412	CR.HCR.XFa	Cobbles, pebbles	Encrusting red algae, anemones, sponge, faunal turf, *Flustra foliacea*, *Calliostoma ziziphynum*	Low – medium	
LB413	CR.HCR.XFa	Pebbles, shell material, odd cobble	Anemones, barnacles, faunal turf, *Echinus esculentus*	Low - medium	
LB414	CR.HCR.XFa	Pebbles, shell, sand covering	Faunal turf, *Flustra foliacea*, *Crossaster papposum*, barnacles, sponges, anemones, hydroids	Low	
LB416	CR.MCR.EcCr.FaAlCr.Bri	Cobbles, sand covering	*Ophiothrix fragilis, Ophiocomina nigra, Echinus esculentus, Luidia ciliaris*, encrusting red algae, sponges	Medium	

Station	Biotope	Substrata	Biological community	'Reefiness'	Example image
LB419	CR.HCR.XFa	Pebbles, shell material	*Urticina felina*, faunal turf, barnacles, serpulid tubes	Low – medium	
LB420	CR.HCR.XFa.ByErSp.DysAct	Cobbles and boulders	Various sponges, *Actinothoe spyrodeta*, bryozoans, hydroids, anemones, *Echinus esculentus*, barnacles, *Asterias rubens, Necora puber*	Medium	
LB421	CR.MCR.EcCr.UrtScr	Pebbles and cobbles, some sand covering	Encrusting red algae, *Echinus esculentus, Urticina felina*, *Actinothoe spyrodeta,* serpulid tubes, faunal turf	Low – medium	
LB422	CR.MCR.EcCr.FaAlCr	Pebbles, some sand covering	Encrusting red algae, *Echinus esculentus*, sparse faunal turf	Low	

Station	Biotope	Substrata	Biological community	'Reefiness'	Example image
LB423	CR.MCR.EcCr.FaAlCr	Cobbles, some sand covering	Barnacles, encrusting red algae, *Echinus esculentus*, asteroids, hydroids, bryozoans, serpulid tubes, sponges	Medium	
LB424	CR.MCR.EcCr.FaAlCr	Cobbles, some sand covering	Hydroids, faunal turf, encrusting red algae, *Echinus esculentus*, *Alcyonium digitatum*, anemones	Medium	
LB425	CR.HCR.FaT.(CTub)	Cobbles and pebbles	Barnacles, asteroids, *Tubularia sp.*, hydroids, anemones, bryozoans and serpulid tubes	Medium	
LB610	CR.HCR.XFa.(ByErSp)	Cobbles and pebbles	Various hydroids, bryozoans, encrusting red algae, Crustacea, *Dendrodoa sp.*	Medium	

A section of Station LB407 had a combination of fauna that did not match any of the biotopes within Connor *et al*. (2004). High abundances of the anemones *Metridium senile* and *Actinothoe sphyrodeta* were observed together on a vertical rock face near the Little Scares, with some encrusting and foliose red algae. Within this data set the biotope name, '*Metridium senile* and *Actinothoe sphyrodeta* on circalittoral rock' (**CR.HCR.FaT.MsenAct**) was therefore used to describe and highlight the presence of this habitat. Station LB407 was the only location in Luce Bay where this particular habitat was observed. Figure 19 shows two example images of this habitat. Further work needs to be undertaken to determine if this habitat should be formally proposed as a new biotope to the JNCC.

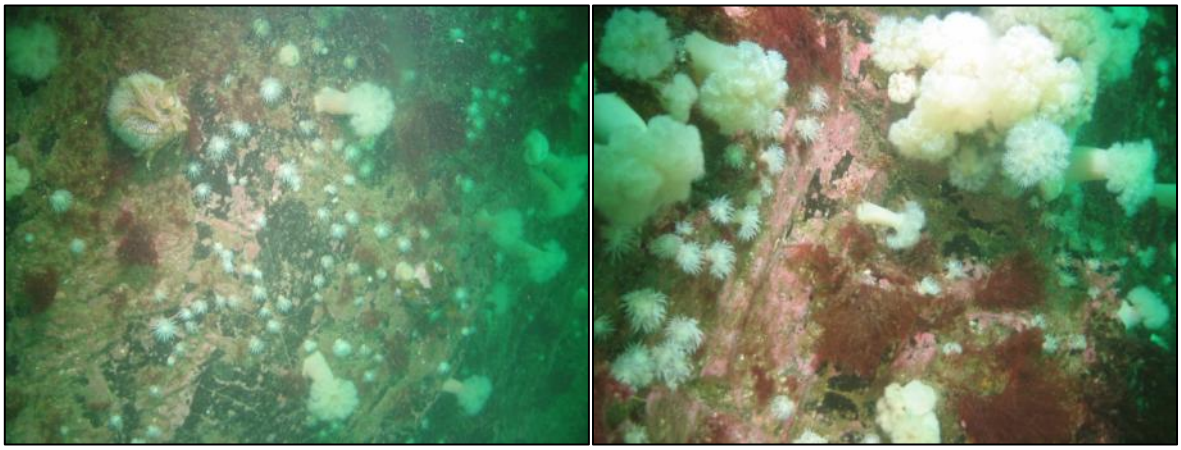


Figure 19. Example images of station LB407.

3.2. Sabellaria reef survey

Figure 20 shows the area surveyed during the investigation of *Sabellaria* reef along the eastern coastline of Luce Bay. The entire coastline within the blue box in Figure 21 was visually examined for potential suitability for *Sabellaria* reef by driving along the coastline and identifying areas where the presence of *Sabellaria* reefs could be ruled out. These were either very exposed rocky shores or sandy bays without boulders. The very exposed shores had a very sparse associated fauna, with little or no algal cover, where only patches of barnacles survived on the boulders. Other areas were open sandy bays, lacking any suitable hard substratum for reefs to form on. Most of the eastern coastline of Luce Bay was unsuitable for *Sabellaria.* Those areas deemed suitable for *Sabellaria* reef were investigated more closely by foot. The areas where *Sabellaria* reefs were found are shown in the inset maps, along with the video lines run from the inflatable tender.

The *Sabellaria* reefs surveyed were all constructed by the polychaete *S. alveolata*. The reefs were found in areas of moderately exposed shoreline characterised by boulders and *Fucus vesiculosus* surrounded by coarse sand. The *S. alveolata* tubes were attached to the boulders, forming flat-topped mounds (see Figure 21). The reefs were best described by the '*Sabellaria alveolata* reefs on sand-abraded eulittoral rock' biotope (**LS.LBR.Sab.Salv**).

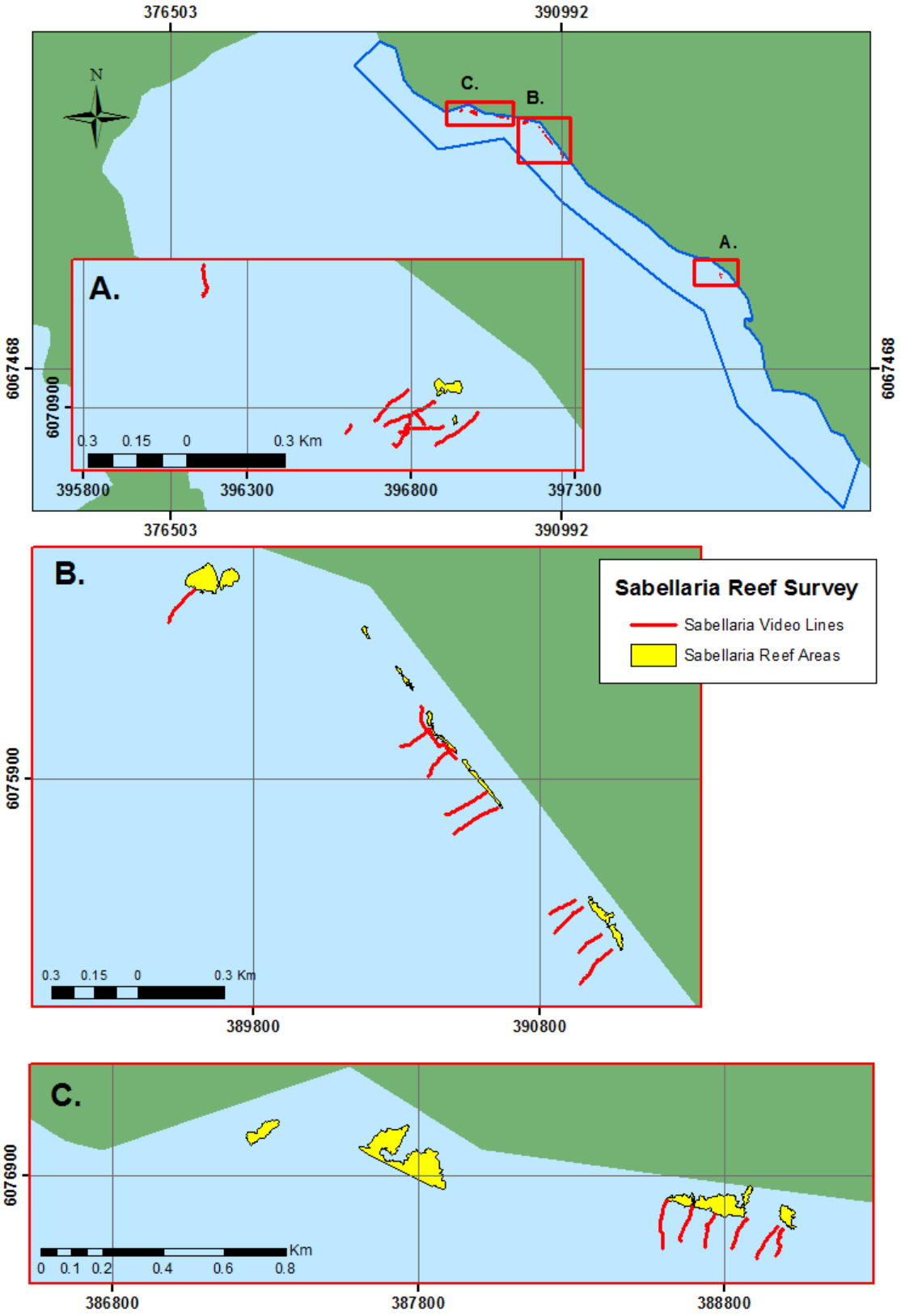


Figure 20. Area of Luce Bay surveyed for the presence of Sabellaria *reefs (blue box). Yellow polygons are reef areas mapped by foot, red lines show video track lines taken using polecam from the inflatable tender. See maps A, B & C for more detail of the extent of* Sabellaria *reefs surveyed. © Crown copyright and database rights [2014] Ordnance Survey 100017908.*

Polecam video lines were all run into the shore. On all lines the inflatable had to turn away from the shore before any *Sabellaria* was observed due to the shoaling of the seabed. The video lines revealed that the seabed there was generally rippled sand, with the odd seaweed covered rock closer into land. The reefs were restricted to the intertidal and did not extend into the sublittoral below the extreme low water springs mark. Therefore the most accurate method to delimit them was to walk around the edges of the *Sabellaria* reefs at low tide on foot. Figure 21 shows some examples of the *Sabellaria* reefs surveyed.

Figure 21. Example images of Sabellaria alveolata *reefs along the eastern coastline of Luce Bay.*

3.3. Benthic grab survey results

3.3.1. Particle size analysis

A range of different sediment habitats were sampled during the grab survey. The three replicate samples collected in the maerl bed (LB115a – c) were classified as either gravel or sandy-gravel, with >65 % gravel fractions, and mud fractions <2.5 %. The other 15 stations sampled all had sand fractions in excess of 60 %. Station LB602 from the mouth of the bay was poorly sorted gravelly-sand, with ~16 % gravel, 82 % sand and 2 % mud.

The four stations along the south-eastern coast (LB510, LB512, LB515 & LB517) all had sand fractions >70 %, with LB510, LB512 and LB515 having sand fractions > 85 %. These three stations also had mud fractions of ~10 %, and gravel fractions below 1.5 %, and were classified as either slightly gravelly-sand or slightly gravelly muddy-sand. LB517 had <5 % mud, and ~22% gravel, and was classified as gravelly-sand. All four stations were poorly sorted.

Stations LB016, LB017 and LB021 at the head of the bay were classified as either slightly gravelly-sand or slightly gravelly muddy-sand, with >85% sand and <1 % gravel. These three stations were either moderately sorted or very well sorted. LB014 had ~64 % sand, 20% mud and 17 % and was classified as very poorly sorted gravelly muddy-sand.

The six stations on the west coast of the bay were either classified as gravelly-sand (LB306, LB001 & LB211) or gravelly muddy-sand (LB316, LB202 & LB206). All six stations had between 68 – 90 % sand fractions, and gravel fractions ranging from 10 – 30 %. The gravelly muddy-sand stations had between 12 – 19 % mud fractions. The six stations were either poorly or very poorly sorted.

The PSA results from the 18 grab samples are summarised in Table 4 and displayed on a modified Folk triangle (Folk, 1954) in Figure 22. The percentage of the gravel: sand: mud fractions present at each location are displayed in Figure 23. Table 5 details the percentage weight of the total sediment retained on each sieve size. Sediment profiles showing cumulative percentage weight retained on each sieve, and additional sediment statistics generated using Gradistat (Blott and Pye, 2001), can be found in Appendix H.

Table 4. Summary of PSA results from van Veen grab samples collected from Luce Bay benthic grab survey 2013

Station	Gravel (%)	Sand (%)	Mud (%)	Depth (m)	Classification (Folk system adapted by BGS)	Sorting Index
	(Wentworth scale)					
LB602	16.01	81.79	2.16	25.1	Gravelly Sand	Poorly Sorted
LB115 a	94.55	4.91	0.73	20.6	Gravel	Moderately Sorted
LB115 b	64.35	33.27	2.41	19.8	Sandy Gravel	Poorly Sorted
LB115 c	90.72	7.96	1.34	20.9	Gravel	Moderately Sorted
LB306	29.31	67.32	3.01	17.7	Gravelly Sand	Very Poorly Sorted
LB001	8.96	89.26	1.86	23.8	Gravelly Sand	Poorly Sorted
LB316	18.93	68.09	12.97	14.2	Gravelly Muddy Sand	Very Poorly Sorted
LB211	15.85	81.16	3.03	11.9	Gravelly Sand	Poorly Sorted
LB202	9.89	71.44	18.68	14.9	Gravelly Muddy Sand	Very Poorly Sorted
LB206	11.77	69.83	18.39	13.1	Gravelly Muddy Sand	Very Poorly Sorted
LB016	0.14	97.51	2.38	7.6	Slightly Gravelly Sand	Very Well Sorted
LB017	0.01	98.56	1.55	6.3	Slightly Gravelly Sand	Very Well Sorted
LB021	0.45	86.42	13.31	12.7	Slightly Gravelly Muddy Sand	Moderately Sorted
LB014	17.03	63.17	19.89	18.2	Gravelly Muddy Sand	Very Poorly Sorted
LB510	1.38	87.68	10.58	13.1	Slightly Gravelly Muddy Sand	Poorly Sorted
LB512	0.65	89.92	9.57	13.9	Slightly Gravelly Sand	Poorly Sorted
LB515	1.15	86.63	12.21	17.6	Slightly Gravelly Muddy Sand	Poorly Sorted
LB517	21.78	73.89	4.25	16.7	Gravelly Sand	Poorly Sorted

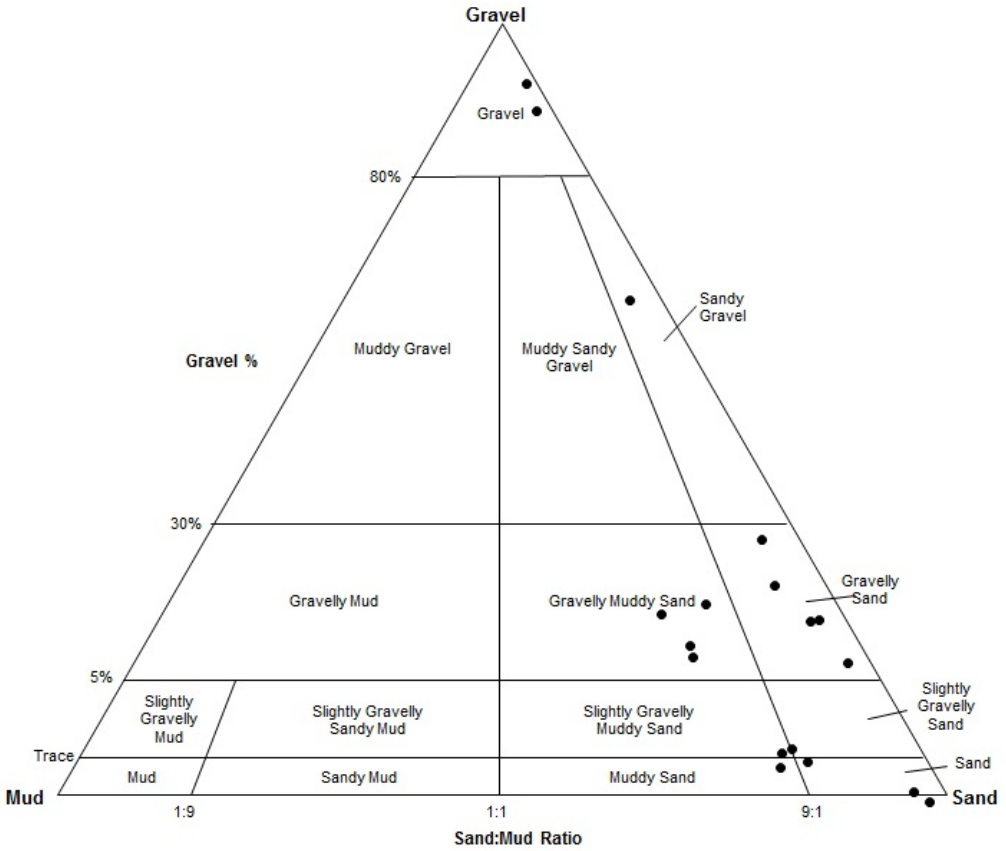


Figure 22. Modified Folk triangle displaying the PSA results for Luce Bay van Veen grab samples.

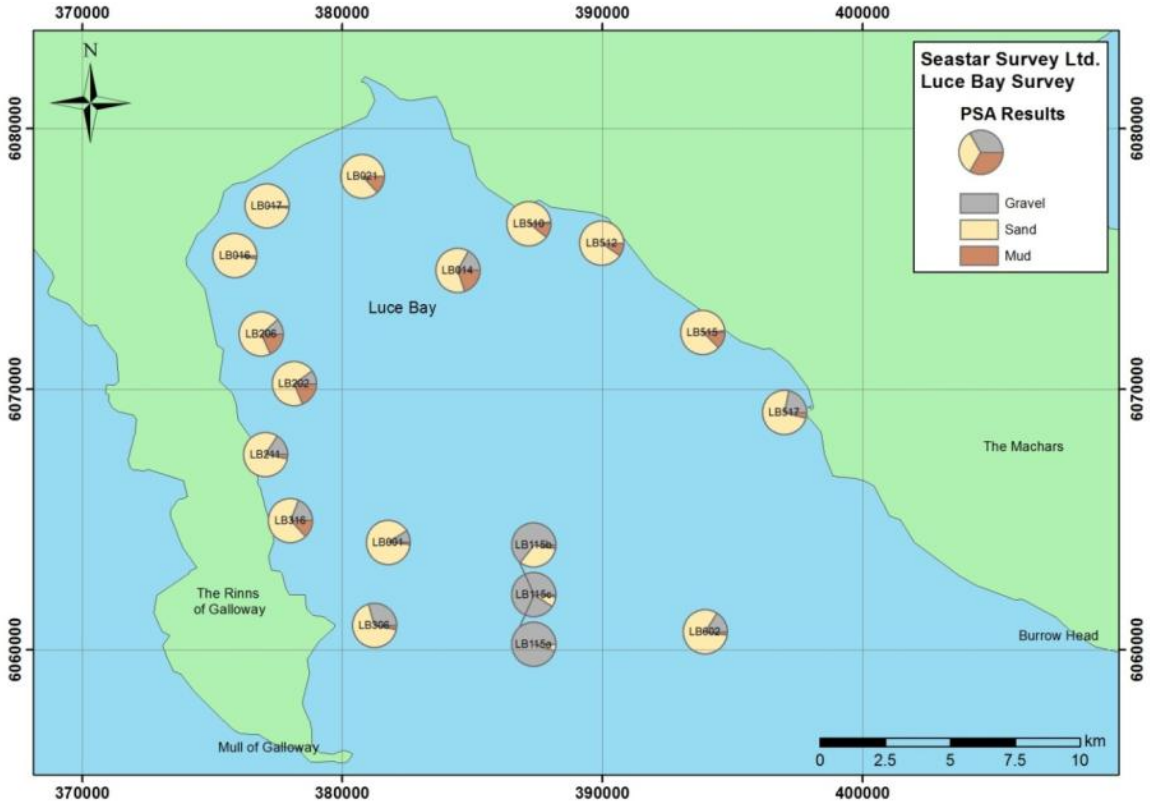


Figure 23. PSA results from benthic grab sampling. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

Table 5. Total percentage sediment weight of grab samples retained on each sieve (grey indicates 'gravel' fraction, light yellow 'sand' fraction, and brown the 'mud' fraction). NB. Processing differential results in the total percentage for each location to be in excess / less than 100%.

Sieve Size (mm)	Station	LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
	63.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	45.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	32.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22.6	0.00	0.00	0.00	0.00	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	16.0	0.00	0.00	0.00	0.00	5.23	0.20	0.00	0.42	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11.2	0.00	1.17	0.77	6.92	0.00	2.67	13.64	0.00	2.32	1.44	0.00	0.00	0.00	2.04	0.00	0.00	0.00	0.78
	8.0	0.15	25.47	9.71	14.70	2.84	0.68	1.28	2.13	2.40	1.87	0.00	0.00	0.00	5.32	0.00	0.08	0.00	4.48
	5.6	0.43	26.08	16.20	21.15	2.64	2.62	0.92	2.60	0.94	2.50	0.09	0.00	0.28	6.04	0.07	0.16	0.44	4.08
	4.0	1.31	22.59	16.43	26.20	3.45	0.92	1.27	3.20	1.27	2.05	0.01	0.00	0.06	1.57	0.17	0.07	0.22	4.49
	2.8	5.09	13.82	14.05	13.80	5.84	0.91	1.01	4.21	0.80	2.35	0.01	0.00	0.07	1.17	0.59	0.15	0.18	3.92
	2.0	9.03	5.42	7.19	7.94	5.25	0.97	0.81	3.29	0.74	1.56	0.03	0.01	0.04	0.89	0.55	0.19	0.30	4.03
	1.4	15.28	2.88	4.69	4.17	6.76	0.51	1.01	3.29	0.78	1.90	0.03	0.01	0.04	1.07	1.14	0.29	0.63	9.40
	1.0	14.58	0.89	2.25	1.18	7.24	0.40	1.55	2.75	0.99	1.90	0.04	0.01	0.08	1.09	1.52	1.63	1.07	25.03
	0.710	8.25	0.22	1.73	0.49	6.40	0.92	1.89	4.52	1.38	1.96	0.05	0.02	0.10	1.30	1.42	3.62	1.61	24.44
	0.500	7.36	0.20	2.67	0.37	9.18	4.65	2.71	27.19	2.06	2.44	0.05	0.02	0.15	1.44	1.30	2.14	1.68	9.56
	0.355	6.94	0.14	6.06	0.43	16.00	19.89	3.88	34.91	3.37	3.08	0.06	0.02	0.18	1.27	0.89	0.50	2.65	0.31
	0.250	9.51	0.17	10.90	0.53	17.72	39.16	6.63	3.82	7.05	4.45	0.12	0.06	0.19	1.27	1.61	0.52	6.16	0.16
	0.180	17.92	0.11	3.62	0.41	4.03	20.81	10.43	1.47	11.75	5.22	0.44	0.35	0.33	1.25	4.23	1.08	24.38	0.24
	0.125	1.74	0.08	0.95	0.18	0.23	2.14	13.74	1.24	11.54	8.12	10.45	20.10	1.35	5.11	5.55	8.49	32.24	2.36
	0.090	0.15	0.14	0.25	0.10	0.09	0.43	19.23	1.23	19.20	21.98	76.82	74.28	50.82	26.10	39.95	43.92	10.68	1.41
	0.063	0.07	0.08	0.15	0.10	0.07	0.35	7.85	0.74	13.32	18.79	9.45	3.70	33.18	23.28	30.06	27.72	5.53	0.98
	< 0.063	2.16	0.73	2.41	1.34	3.01	1.86	12.97	3.03	18.68	18.39	2.38	1.55	13.31	19.89	10.58	9.57	12.21	4.25

3.3.2. Infaunal results

The macrofaunal analysis of the 18 grab samples revealed a total of 1753 individuals and 194 different taxa in the Luce Bay grab samples. The full matrix of taxa identified from each sample can be found in Appendix I. Overall the macrofauna was dominated numerically by Annelida (52.7 %) and Mollusca (27.8 %), with individuals of both phyla representing 80.5 % of all identified fauna (Table 6). The Crustacea comprised 13.6 % and Echinodermata 3.8 % of the macrofaunal individuals respectively. There were few individuals from other phyla (Cnidaria, Nemertea, Sipuncula, Echiura, Pycnogonida and Phoronida), which represented a relatively small proportion of the total number of the fauna (2.1 % combined total).

Table 6. Abundance of macrofaunal individuals by phylum.

Phylum	No. Individuals	% All Individuals
ANNELIDA	922	52.7
MOLLUSCA	486	27.8
CRUSTACEA	239	13.6
ECHINODERMATA	67	3.8
SIPUNCULA	14	0.8
NEMERTEA	12	0.7
CNIDARIA	4	0.2
PHORONIDA	4	0.2
PYCNOGONIDA	2	0.1
ECHIURA	1	0.1

In terms of the total number of different taxa identified, the macrofauna was also dominated by Annelida (58.9 % of all taxa identified) (Table 7). Crustacea and Mollusca contributed 15.6 % and 15.1 % respectively, whilst the remaining groups contributed relatively small proportions to the overall number of species / taxa present.

Table 7. Abundance of macrofaunal taxa by phylum.

Phylum	No. Taxa	% All Taxa
ANNELIDA	113	58.9
CRUSTACEA	30	15.6
MOLLUSCA	29	15.1
ECHINODERMATA	11	5.7
NEMERTEA	2	1.0
SIPUNCULA	2	1.0
PHORONIDA	2	1.0
CNIDARIA	1	0.5
ECHIURA	1	0.5
PYCNOGONIDA	1	0.5

3.3.3. Abundance

Table 8 summarises the 30 most abundant taxa identified from the Luce Bay grab samples based on the total number of individuals found across all samples. Although when examining major taxonomic groups the Annelida dominated the macrofaunal community, numerically the most abundant taxon was the mollusc *Abra alba*. The second most abundant taxon was the polychaete *Lumbrineris gracilis,* followed by the mollusc *Nucula nucleus,* the amphipod *Ampelisca tenuicornis* and the polychaete *Notomastus latericeus*. These species are characteristic of different habitats, with *Abra alba* and *Ampelisca tenuicornis* typical for soft, silty sediments, and *Lumbrineris gracilis* and *Notomastus latericeus* more characteristic of coarser sediment types, including sand and gravel (Hayward and Ryland, 1990). The range of taxa relates well to the different types of sediment identified from the PSA of the grab samples.

Table 8. 30 most abundant taxa identified from Luce Bay benthic grab samples

MCS code	Taxa	Abundance
W2059	*Abra alba*	196
P0579	*Lumbrineris gracilis*	125
W1570	*Nucula nucleus*	88
S0440	*Ampelisca tenuicornis*	61
P0921	*Notomastus latericeus*	49
S0588	*Leptocheirus hirsutimanus*	48
P1341	*Spirobranchus triqueter*	47
P1124	*Melinna palmata*	45
P0964	*Euclymene oerstedii*	42
P0794	*Spiophanes bombyx*	41
W1837	*Thyasira flexuosa*	38
S0249	*Urothoe marina*	36
W0053	*Leptochiton asellus*	36
P0260	*Glycera lapidum*	32
W1906	*Kurtiella bidentata*	32
P0349	*Syllis cornuta*	30
P1257	Sabellidae indet. dam.	27
ZB161	*Amphipholis squamata*	27
P1340	*Spirobranchus lamarcki*	25
P0638	*Protodorvillea kefersteini*	23
W2231	*Thracia phaseolina*	23
ZB151	*Acrocnida brachiata*	20
P0425	*Sphaerosyllis bulbosa*	19
S0257	*Harpinia pectinata*	19
P0788	*Spio armata* agg.	16
P0104	*Sigalion mathildae*	15
P0106	*Sthenelais* sp.	14
P0109	*Sthenelais limicola*	14
P0114	Phyllodocidae sp. indet.	14
P0118	*Eteone longa*	14

Table 9 shows the 30 most common taxa (i.e. those found within the most samples). Some of the most common species were similar to the top 30 most abundant species. *Lumbrineris gracilis, Abra alba* and *Nucula nucleus* were found at high numbers, and were recorded from at least 50 % of the samples. Most species were only present in fewer than half of the samples, again reflecting the range of different sediment types sampled.

Table 9. 30 most common taxa (% samples present) identified from Luce Bay benthic grab samples

MCS code	Taxa	% Samples Present
P0579	*Lumbrineris gracilis*	77.8
P0260	*Glycera lapidum*	61.1
P0794	*Spiophanes bombyx*	50.0
W1570	*Nucula nucleus*	50.0
W2059	*Abra alba*	50.0
G001	Nemertea indet.	44.4
P0921	*Notomastus latericeus*	44.4
P0025	Polynoidae indet. dam./juv.	38.9
P0964	*Euclymene oerstedii*	38.9
P1340	*Spirobranchus lamarcki*	38.9
S0440	*Ampelisca tenuicornis*	38.9
W1837	*Thyasira flexuosa*	38.9
W1906	*Kurtiella bidentata*	38.9
W2231	*Thracia phaseolina*	38.9
P0498	*Nephtys cirrosa*	33.3
P0569	Lumbrineridae indet. Juv.	33.3
P0672	*Scoloplos armiger*	33.3
P0720	*Spionidae indet.* dam.	33.3
P0938	Maldanidae sp. indet. dam.	33.3
P1235	*Polycirrus* sp.	33.3
No number	*Euspira nitida*	33.3
ZB161	*Amphipholis squamata*	33.3
P0094	*Pholoe* cf. *synophthalmica*	27.8
P0349	*Syllis cornuta*	27.8
P0424	*Sphaerosyllis* sp. juv.	27.8
P0425	*Sphaerosyllis bulbosa*	27.8
P1124	*Melinna palmata*	27.8
P1242	*Polycirrus medusa*	27.8
S0257	*Harpinia pectinata*	27.8
W0053	*Leptochiton asellus*	27.8

3.3.4. Diversity

The results of the species diversity analysis of the Luce Bay samples are given in Table 10. The total numbers of individuals present in the 18 sediment grab samples ranged from 13 individuals per sample to 309 individuals per sample, whilst the total number of taxa ranged from 5 to 50 per sample.

The species diversity (Shannon-Wiener diversity index) ranged from 1.39 to 3.16. Diversity was highest at locations LB316, LB014 and LB510, and lowest at LB016. Species richness was highest at stations LB206, LB202 and LB515, with the lowest value found at LB016 (see Figure 3 for location of stations).

The equitability (J) and dominance (Simpson's) results suggested a high equitability overall, indicating an equal distribution between species at most stations. The lowest equitability value calculated was 0.72 (LB515), which still indicated a relatively even distribution between the taxa present in the sample. The lowest equitability was found at stations LB515, LB206 and LB202. These three stations had the highest number of different taxa present, but also the highest number of total individuals (N), suggesting one or more species dominated the community in terms of numbers within these three samples. For example, out of 309 individuals in LB515, 122 were *Abra alba*, 49 out of 211 individuals were *Nucula nucleus* in LB202, whilst from a total of 220 individual in LB206, 61 were *Lumbrineris gracilis.*

Table 10. Univariate faunal community statistics for Luce Bay grab samples. Statistics include: Total number of individuals (N), number of species (S), Margalef's species richness (d), Pielou's equitability index (J), Shannon-Wiener diversity index (H') and Simpson's Dominance Index

Station	S	N	d	J	H'($\log_e$)	Simpson's
LB602	16	27	4.55	0.91	2.52	0.92
LB115a	35	133	6.95	0.81	2.86	0.92
LB115b	30	52	7.34	0.88	2.98	0.93
LB115c	6	13	1.95	0.85	1.52	0.79
LB306	18	35	4.78	0.92	2.65	0.93
LB001	18	25	5.28	0.96	2.78	0.97
LB316	38	109	7.89	0.87	3.16	0.94
LB211	32	166	6.06	0.76	2.62	0.87
LB202	45	211	8.22	0.75	2.85	0.89
LB206	50	220	9.08	0.73	2.84	0.88
LB016	5	14	1.52	0.86	1.39	0.77
LB017	11	18	3.46	0.91	2.18	0.91
LB021	19	38	4.95	0.90	2.66	0.93
LB014	41	153	7.95	0.84	3.14	0.94
LB510	36	115	7.38	0.84	3.02	0.93
LB512	13	19	4.08	0.96	2.45	0.95
LB515	47	309	8.02	0.72	2.79	0.83
LB517	31	94	6.60	0.78	2.69	0.89

The total number of species and individuals present at each location is illustrated in Figure 24, whilst the Shannon-Wiener diversity is shown on Figure 25. The stations towards the middle of the eastern and western coastlines of Luce Bay tended to have the highest number of taxa and individuals, and species diversity. In addition, the samples from the maerl bed (LB115) tended to have relatively high species diversity, total taxa and total individuals, barring the third replicate (LB115c). This sample had the second lowest number of species and total individuals recorded.

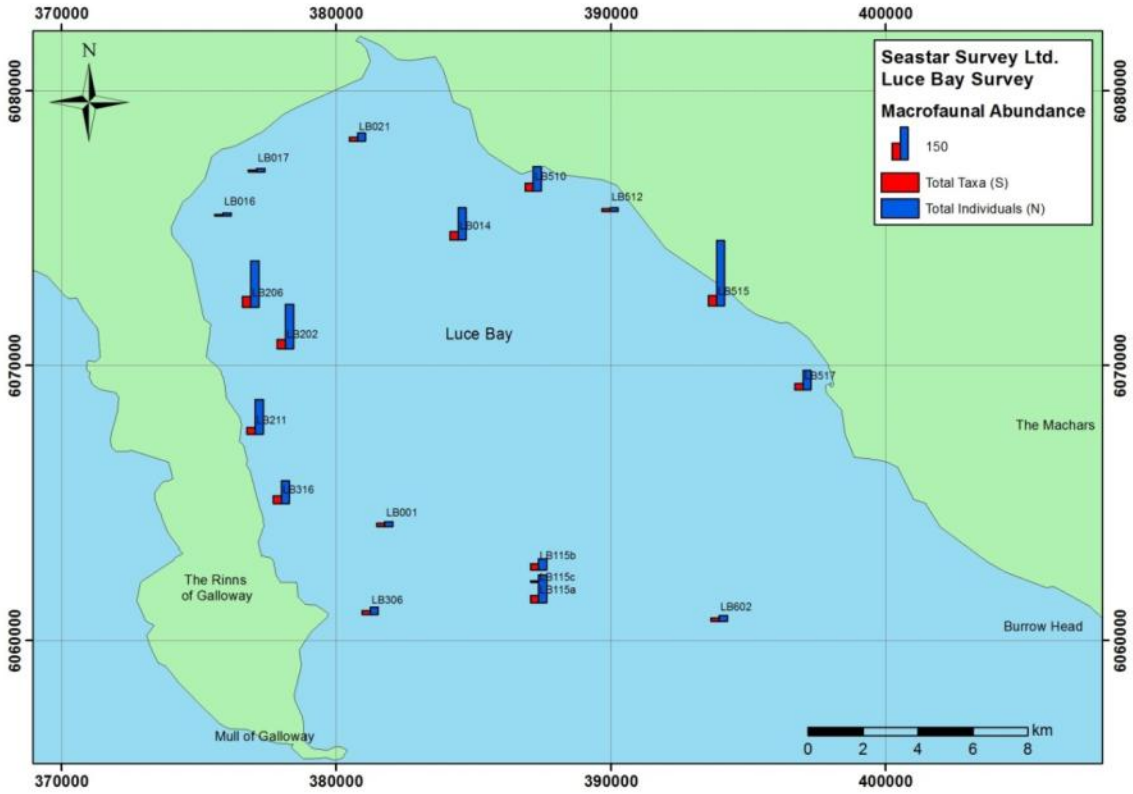


Figure 24. Faunal abundances at each station, Luce Bay benthic grab survey. Size of bars indicates abundance, where the blue bar in the legend shows Total Individuals = 150). © Crown copyright and database rights [2014] Ordnance Survey 100017908.

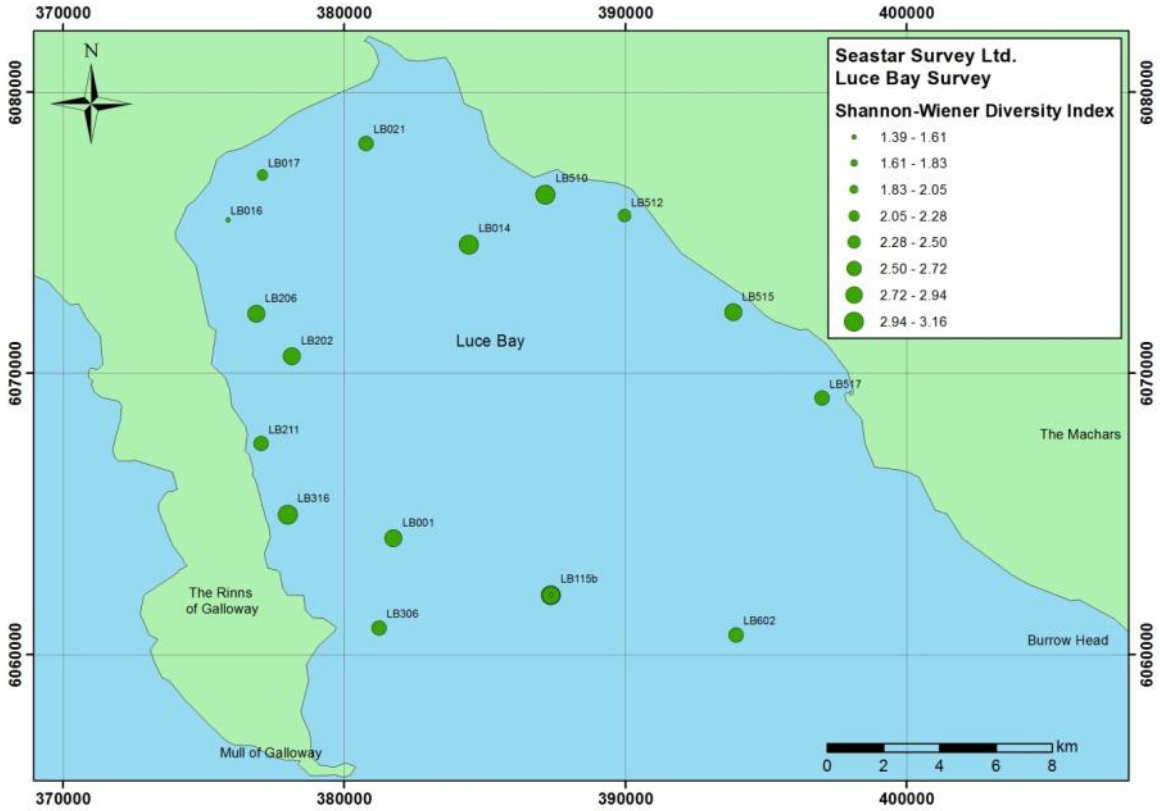


Figure 25. Shannon-Wiener Diversity Index at each station, Luce Bay benthic grab survey. NB. LB115 replicates overlap – please see Table 10 for exact values. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

3.3.5. Macrofaunal composition

The results from the cluster analysis and ordination of the Luce Bay infaunal data are given in Figures 26 and 27.

The cluster analysis (Figure 26) by station resulted in four main groups. Group A included stations LB016 and LB017 only. The second cluster (Group B) revealed two objectively-derived clusters (B1 and B2) and one outlier (B). The data suggested only small differences between the faunal communities present within cluster group B overall, and the relationships between the habitats could be described as a continuum across the stations. Groups C and D were clustered separately from the samples in groups B and A. The SIMPROF routine supported the groups and sub-groups assigned to the clusters observed in the dendrogram.

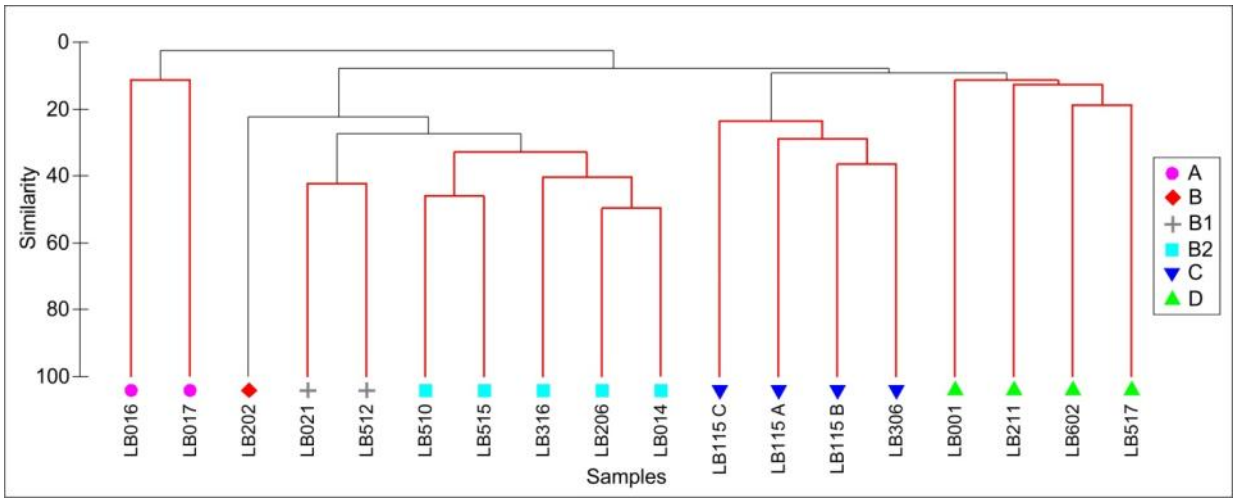


Figure 26. Cluster analysis dendrogram of Luce Bay macrofaunal data generated by SIMPROF routine in PRIMER v.6. Red lines indicate statistically significant relationships between faunal communities present in each sample

The ordination analysis supported the cluster analysis (Figure 27), with stations grouping together as per the cluster analysis dendrogram. The ordination plot had a medium level of stress (0.14).

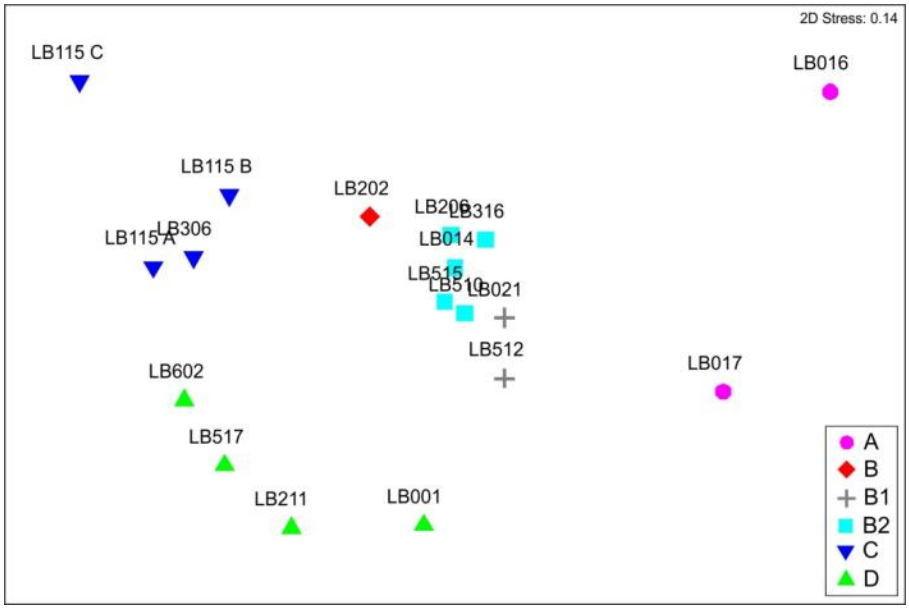


Figure 27. Ordination (multi-dimensional scaling) plot of Luce Bay macrofaunal data.

The grouping of stations within clusters showed a close relationship to the sediment classification applied to each sample from the PSA analysis (Figure 28). Group A contained stations with slightly gravelly-sand, group B mixed sediments (slightly gravelly and gravelly muddy-sands), group C coarse sediments (principally gravel and sandy-gravel), and group D gravelly-sand. This highlights the association between the type of sediment habitat and the structure of faunal communities found within them.

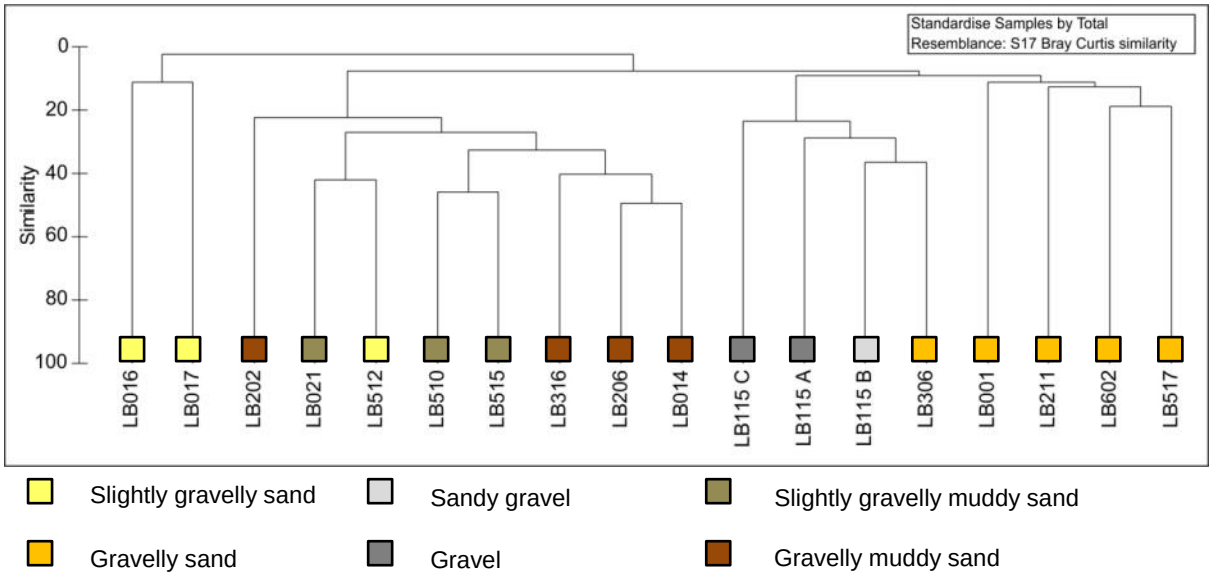


Figure 28. Sediment classification from each sample overlaid on cluster analysis dendrogram created from macrofaunal community data.

The SIMPER analysis results are given in Table 11. The table summarises the characteristic species which defined each cluster group, along with their percentage contribution to defining each cluster. All species which contributed 90 % of the characteristic taxa present in all groups are shown, apart from group B2, which includes species contributing 70 % of the characteristic taxa present. The stations in group A were characterised by relatively low species diversity (see above), with low numbers of species but also few individuals compared to the stations clustered within the other groups. The dominant species were *Magelona johnstoni* and *Angulus fabula*.

Mixed sediments, such as those found in cluster group B, tend to have high species diversity and richness, which was supported by the univariate statistical analysis. The clusters in group B (B, B1 and B2) all had relatively high species diversity. There was high equitability in group B1 (>0.9) suggesting an equal distribution between species. Equitability was comparatively low in group B2 (0.72 – 0.87), indicating greater dominance by some taxa in this cluster group. Species richness was higher in group B2 compared to B1. The SIMPER analysis suggested different species were characteristic of the two groups (Table 11). Whilst group B1 was characterised by *Thyasira flexuosa, Lumbrineris gracilis* and *Spiophanes bombyx*, group B2 was characterised by *Abra alba, Lumbrineris gracilis* and *Ampelisca tenuicornis.* Although some taxa, including *Thyasira flexuosa, Kurtiella bidentata* and *Spiophanes bombyx,* were present in both groups, the relative contribution of these taxa was different, suggesting slightly different faunal communities in these samples.

The faunal community from samples in group C were characterised mainly by the presence of the chiton *Leptochiton asellus,* but *Amphipholis squamata* was also relatively important in terms of the contribution to the community structure. Other characterising taxa included *Glycera lapidum, Lumbrineris gracilis* and *Sphaerosyllis bulbosa*. Several of these taxa (e.g. *Leptochiton asellus* and *Amphipholis squamata*) suggested that the sediment environment at

these sites was coarse, potentially with rock, gravel and sand (Hayward and Ryland, 1990), matching with the sediment data in Figure 28.

The equitability in group D samples was high with a medium level of species diversity and species richness compared to the other samples. The fauna was characterised primarily by *Glycera lapidum, Lumbrineris gracilis* and *Syllis cornuta,* which suggested a sediment environment consisting primarily of sand or muddy-sand (Hayward and Ryland, 1990). Figure 28 showed the sediment for the group D stations to be gravelly-sands.

Table 11. SIMPER analysis of the main faunal groupings identified from cluster analysis of the Luce Bay macrofaunal data.

Group / cluster	% contribution of characterising species	
	Taxa / species	**Contribution (%)**
A	*Magelona johnstoni*	50.00
	Angulua fabula	50.00
B1	*Thyasira flexuosa*	37.50
	Lumbrineris gracilis	18.75
	Spiophanes bombyx	12.50
	Nucula nucleus	12.50
	Kurtiella bidentata	12.50
B2	*Abra alba*	22.62
	Lumbrineris gracilis	10.33
	Ampelisca tenucornis	7.85
	Melinna palmate	6.71
	Notomastus latericeus	6.43
	Spoiphanes bombyx	5.33
	Thyasira flexousa	4.56
	Euclymene oerstedii	4.53
	Kurtiella bidentata	3.72
C	*Leptochiton asellus*	40.71
	Amphipholis squamata	27.83
	Spirobranchus lamarcki	7.22
	Glycera lapidum	5.84
	Sphaerosyllis bulbosa	4.50
	Lumbrineris gracilis	2.76
	Timoclea ovate	2.66
D	*Glycera lapidum*	28.86
	Lumbrineris gracilis	12.68
	Syllis cornuta	12.63
	Sphaerosyllis bulbosa	6.91
	Polycirrus medusa	5.19
	Caulleriella alata	4.81
	Nemertea indet.	4.33
	Sphaerosyllis sp. juv.	4.33
	Polycirrus sp.	4.33
	Aonides paucibranchiata	3.91

Figure 29 shows the geographical spread of the grab stations according to their cluster group. Group A was found in the north-west corner of the bay. The stations from group B tended to be found along the eastern and western coastlines of the bay, whilst groups C and D were found more towards the mouth of the bay.

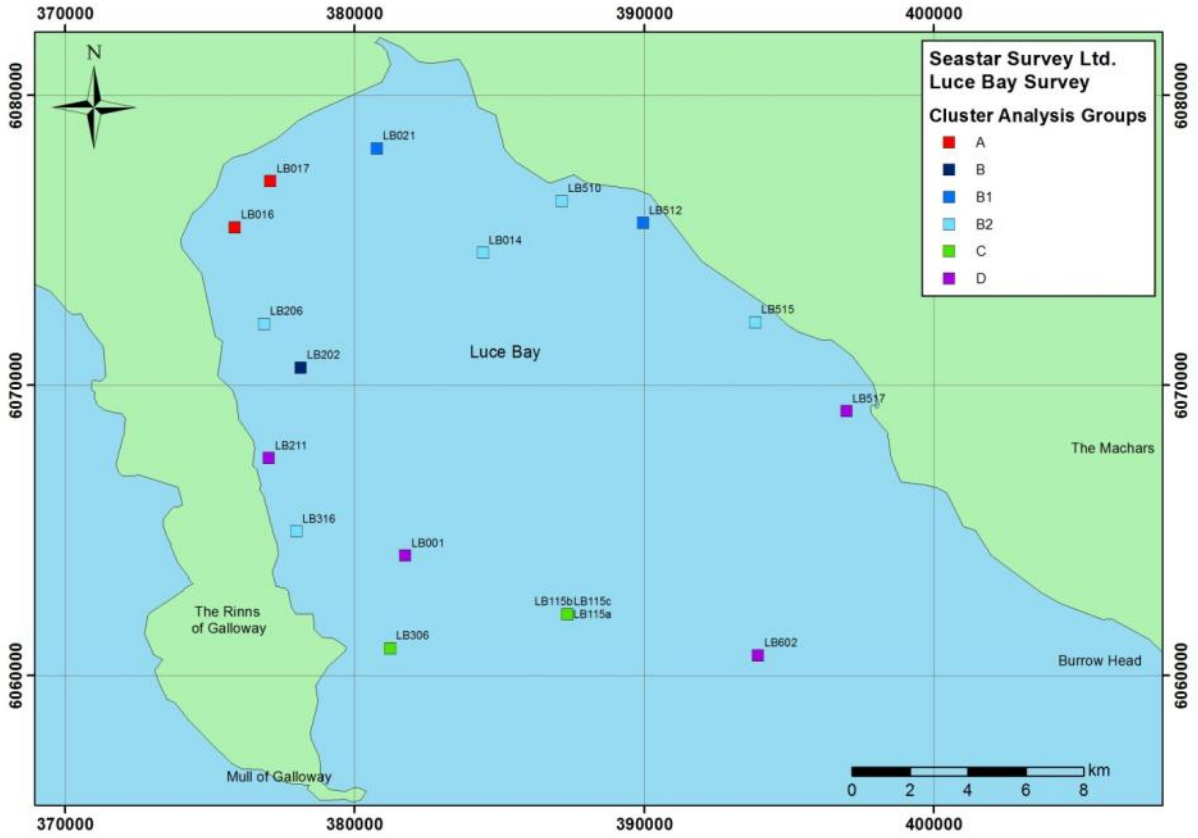


Figure 29. Geographical distribution of macrofaunal groups as defined by cluster analysis at each station, Luce Bay benthic grab survey. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

3.3.6. Biotope designation

Table 12 lists the biotope assigned to each station. After assessment of the cluster analysis, the faunal community at each station was examined in more detail and the characteristic species at each location identified. The depth of the sample and the sediment classification were examined, and then the most appropriate biotope assigned to each station.

Cluster group A was characterised by the 'infralittoral muddy sand' (**SS.SSa.IMuSa**) biotope complex. The fauna at station LB016 mostly matched the sub-biotope '*Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand' (**SS.SSa.IMuSa.FfabMag**), although it lacked some characteristic species such as amphipods. Replicate sampling would have clarified the faunal community present within these samples.

Cluster group B was mainly composed of biotopes within the 'circalittoral mixed sediments' (**SS.SMx.CMx**) complex, with '*Mysella bidentata* and *Thyasira* spp. in circalittoral muddy mixed sediment' (**SS.SMx.CMx.MysThyMx**) the most common. **MysThyMx** was generally species rich, and characterised by the bivalves *Kurtiella bidentata, Thyasira flexuosa* and *Abra alba*, various polychaetes including *Spiophanes bombyx, Lumbrineris gracilis,*

Notomastus latericeus, Glycera lapidum and *Scoloplos armiger*, and the amphipod *Ampelisca tenuicornis.* The biotope **SS.SMx.CMx.(MysThyMx)** was used to designate those stations where the associated fauna fit the biotope less well and more of the characteristic species were absent. The fauna present at LB202 included a large number of keel worms *Spirobranchus* spp., suggesting a high fraction of larger sediment material. LB202 was designated as **SS.SMx.CMx** as the faunal community did not fit closely with any of the sub-biotopes within this biotope complex. Group B also included station LB515, which was assigned to the 'circalittoral muddy sand' biotope (**SS.SSa.CMuSa**). In addition to many of the species that characterised the **MysThyMx** samples, LB515 contained fauna including *Echinocardium cordatum* and large numbers of various tube dwelling amphipods, which fitted better with **SS.SSa.CMuSa** rather than **SS.SMx.CMx.**

The three replicate samples from the maerl bed (LB115a – c) all contained fauna characteristic of coarse sediment, in addition to maerl rhodoliths (Figure 30). All the samples from LB115 were classified as **SS.SMp.Mrl.Pcal**. One replicate (LB115c) had lower abundance of taxa, individuals and species diversity compared to the other two, which probably represented patchiness within the maerl bed. Station LB306 contained many of the same taxa as LB115, but lacked the maerl component. The faunal community most closely matched the biotope '*Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel', but lacked some of the characteristic species, so was assigned the biotope **SS.SCS.CCS.(MedLumVen)**.

Figure 30. Example images of Phymatolithon calcareum *maerl rhodoliths sampled from station LB115. Scale bar in images = 1 cm*

All four stations within cluster group D were assigned different biotopes. This was not surprising considering the low percentage of similarity between the stations as shown in the cluster analysis dendrogram. Three stations were designated as coarse sediment biotopes (**SS.SCS.CCS** and **SS.SCS.ICS**). Station LB602 was faunally sparse, and was assigned the biotope **SS.SCS.CCS** as the fauna present did not match any of the sub-biotopes. Large numbers of the polychaete *Protodorvillea kefersteini* were found at LB517, but the sample was otherwise relatively faunally sparse. This matched well with the description for the biotope '*Protodorvillea kefersteini* and other polychaetes in impoverished circalittoral mixed gravelly sand' (**SS.SCS.CCS.Pkef**). LB001 was characterised by the polychaetes *Nephtys cirrosa*, *Ophelia borealis* and *Glycera lapidum*, which fitted well with the '*Glycera lapidum* in impoverished infralittoral mobile gravel and sand' biotope **(SS.SCS.ICS.Glap)**. Large numbers of amphipods such as *Urothoe*, *Ampelisca* and *Leptocheirus* characterised LB211, suggesting a sandy biotope, with the faunal community best matching the 'semi-permanent

tube-building amphipods and polychaetes in sublittoral sand' biotope (**SS.SSa.IFiSa.TbAmPo**).

Table 12.Summary of biotopes assigned to faunal grab samples, Luce Bay benthic grab survey 2013

Station #	Characteristic Species	Depth (m)	Cluster Group	Biotope
LB016	*Magelona johnstoni, Chaetozone christiei, Angulus fabula*	7.6	A	SS.SSa.IMuSa.(FfabMag)
LB017	*Philine aperta, Bathyporeia pelagica, Eumida bahusiensis*	6.3	A	SS.SSa.IMuSa
LB202	*Lepidonotus squamatus, Pholoe* spp., *Nephtys* spp., *Lumbrineris* spp., *Scoloplos armiger, Notomastus latericeus, Ampharete lindstroemi, Spirobranchus* spp., *Ampelisca tenuicornis, Leptochiton asellus, Nucula nucleus, Monia squama, Thyasira flexuosa, Abra alba*	14.9	B	SS.SMx.CMx
LB021	*Lumbrineris gracilis, Spiophanes bombyx, Euclymene oerstedii, Nucula nucleus, Kurtiella bidentata, Thyasira flexuosa*	12.7	B1	SS.SMx.CMx.(MysThyMx)
LB512	*Thyasira flexuosa, Spiophanes bombyx, Nephtys hombergii, Lumbrineris gracilis*	13.9	B1	SS.SMx.CMx.(MysThyMx)
LB316	*Nephtys* spp., *Lumbrineris gracilis, Notomastus latericeus, Euclymene oerstedii, Clymenura* sp., *Owenia fusiformis, Melinna palmata, Harpinia pectinata, Ampelisca tenuicornis, Thyasira flexuosa, Abra alba, Thracia phaseolina, Ophiura albida*	14.2	B2	SS.SMx.CMx.(MysThyMx)
LB206	*Amphipholis squamata, Abra alba, Kurtiella bidentata, Thyasira flexuosa, Ampelisca tenuicornis, Ampharete lindstroemi, Melinna palmata, Notomastus latericeus, Mediomastus fragilis, Spio decorata, Spiophanes bombyx, Lumbrineris gracilis*	13.1	B2	SS.SMx.CMx.MysThyMx
LB014	*Abra alba, Kurtiella bidentata, Thyasira flexuosa, Nucula nucleus, Photis longicaudata, Ampelisca tenuicornis, Harpinia pectinata, Spirobranchus* spp., *Melinna palmata, Euclymene* spp., *Notomastus latericeus, Spiophanes bombyx, Lumbrineris gracilis, Glycera lapidum*	18.2	B2	SS.SMx.CMx.MysThyMx
LB510	*Nephtys* spp., *Lumbrineris gracilis, Scoloplos armiger, Spiophanes bombyx, Euclymene* spp., *Melinna palmata, Tanaopsis graciloides, Nucula nucleus, Thyasira flexuosa, Kurtiella bidentata, Abra alba, Thracia phaseolina*	13.1	B2	SS.SMx.CMx.MysThyMx
LB515	*Echinocardium cordatum, Acrocnida brachiata, Thracia phaseolina, Dosinia lupinus, Abra alba, Kurtiella bidentata, Tellimya ferruginosa, Nucula nucleus, Euspira nitida, Crassicorophium crassicorne, Ampelisca tenuicornis, Harpinia pectinata, Melinna palmata,* Oweniidae sp., *Scalibregma inflatum, Euclymene oerstedii, Notomastus latericeus, Chaetozone* spp., *Spiophanes bombyx, Lumbrineris gracilis, Phyllodoce mucosa, Pholoe* cf. *synophthalmica*	17.6	B2	SS.SSa.CMuSa
LB115a	*Amphipholis squamata, Leptochiton asellus, Jasmineira caudata,* Sabellidae spp., *Spio armata* agg., *Laonice* spp., *Lumbrineris gracilis, Glycera lapidum, Sphaerosyllis bulbosa*	20.6	C	SS.SMp.Mrl.Pcal
LB115b	*Amphipholis squamata, Leptochiton asellus, Sphaerosyllis* spp.	19.8	C	SS.SMp.Mrl.Pcal
LB115c	*Gibbula tumida, Leptochiton asellus*	20.9	C	SS.SMp.Mrl.Pcal
LB306	*Glycera lapidum, Lumbrineris gracilis, Aonides paucibranchiata, Polycirrus medusa, Spirobranchus* spp., *Leptochiton asellus, Nucula nucleus, Amphipholis squamata*	17.7	C	SS.SCS.CCS.(MedLumVen)
LB602	*Sphaerosyllis bulbosa, Syllis hyalina, Glycera lapidum*	25.1	D	SS.SCS.CCS

Station #	Characteristic Species	Depth (m)	Cluster Group	Biotope
LB001	*Ophiura* sp., *Synchelidium haplocheles, Ophelia borealis, Nephtys cirrosa, Glycera lapidum*	23.8	D	SS.SCS.ICS.Glap
LB211	*Nucula hanleyi, Nucula nucleus, Crassicorophium crassicorne, Leptocheirus hirsutimanus, Ampelisca tenuicornis, Urothoe marina, Pontocrates altamarinus, Pista cristata, Polycirrus medusa, Mediomastus fragilis, Notomastus latericeus, Aonides paucibranchiata, Scoloplos armiger, Syllis cornuta, Glycera lapidum*	11.9	D	SS.SSa.IFiSa.TbAmPo
LB517	Sipuncula sp., *Syllis cornuta, Sphaerosyllis* spp., *Protodorvillea kefersteini, Schistomeringos neglecta*	16.7	D	SS.SCS.CCS.Pkef

Figure 31 shows the geographical distribution of the biotopes assigned to the benthic grab samples. The coarse sediment biotopes generally occurred toward the mouth of the bay, with the muddy-sand biotopes towards the north-west corner of Luce Bay. Mixed sediment biotopes were most common in the centre of the bay.

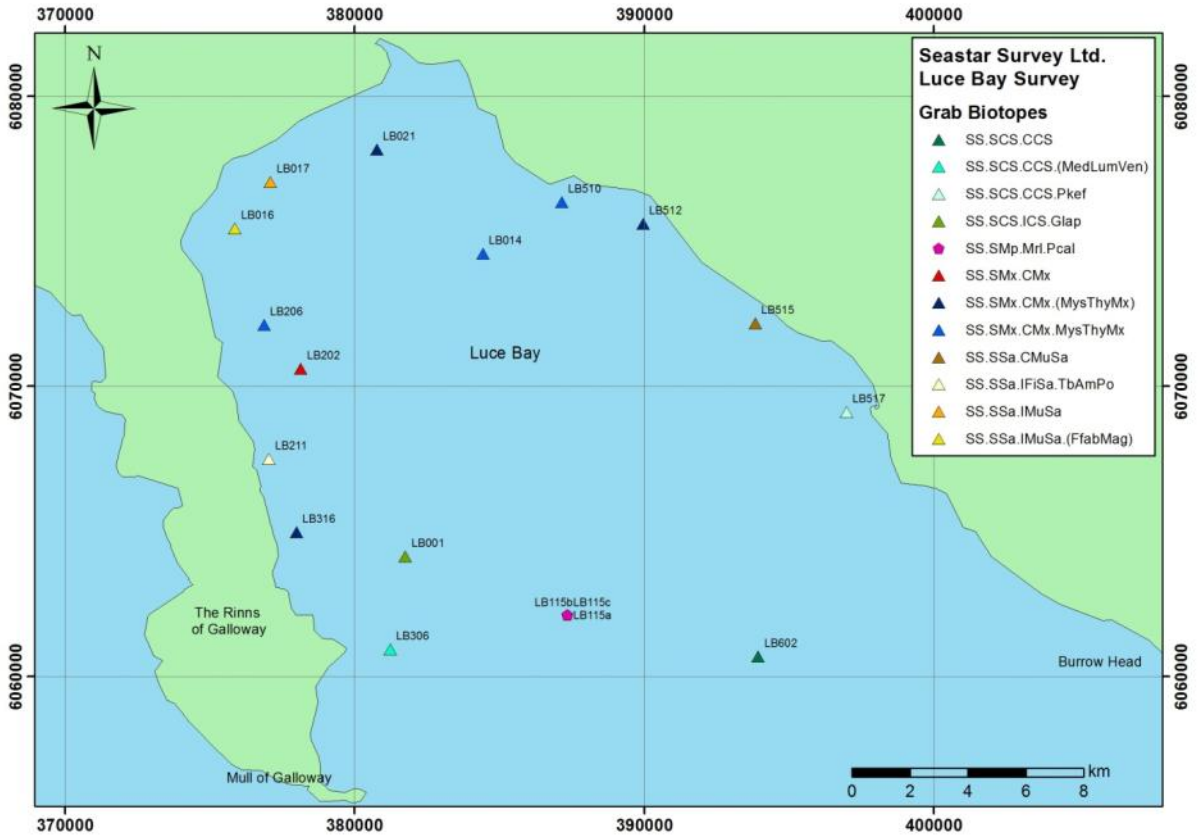


Figure 31. Geographical distribution of biotopes based on macrofaunal samples, Luce Bay benthic grab survey. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

3.3.7. Comparisons with drop-down camera data

Table 13 summarises the biotopes designated for each grab station based on both the drop-down camera survey and the faunal data collected from the sediment samples. Some stations had matching biotopes (i.e. LB017, LB202, LB515, LB115, LB602). These stations generally had faunal communities which did not particularly match any sub-biotopes,

excluding LB115, where the presence of maerl clearly defined the habitat. For several stations the infaunal data allowed refining of biotopes from biotope to sub-biotope level (i.e. LB016, LB316, LB206, LB306, LB001 and LB517). The refinement of some biotopes demonstrated the difficulty of accurately assigning biotopes based on depth, with many stations spanning the boundary between infralittoral and circalittoral depths. Only five stations were assigned to different biotope complexes based on the grab data compared to the video data. Three of these stations (LB014, LB021, LB512 and LB510) were assigned muddy-sand biotopes based on the camera survey, but mixed sediment biotopes based to the sediment samples. None of the fauna that characterised the grab biotopes would have been visible from the camera data, and the difference between the sediment (i.e. muddy-sand versus mixed sediments) can also be difficult to diagnose accurately from video footage. Similar reasons explained the differences between the biotopes assigned to station LB211.

Table 13. Comparison table showing biotopes assigned to stations according to the drop-down camera survey and the benthic grab survey

Station #	Drop-down Camera Biotope	Benthic Grab Biotope
LB016	SS.SSa.IMuSa	SS.SSa.IMuSa.(FfabMag)
LB017	SS.SSa.IMuSa	SS.SSa.IMuSa
LB202	SS.SMx.CMx	SS.SMx.CMx
LB021	SS.SSa.CMuSa	SS.SMx.CMx.(MysThyMx)
LB512	SS.SSa.IMuSa	SS.SMx.CMx.(MysThyMx)
LB316	SS.SMx.IMx	SS.SMx.CMx.(MysThyMx)
LB206	SS.SMx.IMx	SS.SMx.CMx.MysThyMx
LB014	SS.SSa.CMuSa	SS.SMx.CMx.MysThyMx
LB510	SS.SSa.IMuSa	SS.SMx.CMx.MysThyMx
LB515	SS.SSa.CMuSa	SS.SSa.CMuSa
LB115a	SS.SMp.Mrl.Pcal	SS.SMp.Mrl.Pcal
LB115b	SS.SMp.Mrl.Pcal	SS.SMp.Mrl.Pcal
LB115c	SS.SMp.Mrl.Pcal	SS.SMp.Mrl.Pcal
LB306	SS.SCS.ICS.SSh	SS.SCS.CCS.(MedLumVen)
LB602	SS.SCS.CCS	SS.SCS.CCS
LB001	SS.SCS.CCS	SS.SCS.ICS.Glap
LB211	SS.SMx.IMx	SS.SSa.IFiSa.TbAmPo
LB517	SS.SSa.CMuSa and SS.SCS.CCS	SS.SCS.CCS.Pkef

4. DISCUSSION

4.1. Key survey objectives

Sufficient data were gathered to complete all of the key survey objectives. A large amount of high quality video footage and still photographic images were collected from Luce Bay, improving habitat resolution along the western coastline and around The Scares and the mouth of the bay in particular.

Maerl had been previously collected in a BGS grab sample, and there was a possible video footage record from the 2007 survey. The locations of these previous records were revisited during the survey, and maerl was not found at either site. However, one of the new survey stations sited to provide better habitat record coverage did hit a large maerl bed in Key Area 1, and additional stations were sited to map the extent of the feature. Triplicate grab samples were taken from a single station within this maerl bed, all collecting *Phymatolithon calcareum* maerl rhodoliths.

Intertidal reefs formed by *Sabellaria alveolata* were mapped on the eastern coastline. Some of these reefs occurred in locations of previous records. Several of the older records of *Sabellaria* reef were not confirmed, and some reefs were found in areas previously not investigated. The lack of reef in some areas where previously recorded may be due to degradation of the feature, or inaccurate recording of the positions. Some of the old records were from sections of very exposed coastline which were very unsuitable for the potential establishment of *Sabellaria*.

No live mussels were seen at any of the stations investigated. However, large numbers of dead shells belonging to the horse mussel *Modiolus modiolus* were observed at several sites throughout the bay during the survey (Figure 32). It is very unlikely that these aggregations of dead shells represent areas where mussel beds may have been established previously. The density of the dead shells suggests either anthropogenic depositing of previously dredged mussels, or aggregating effects of the strong current and tides within Luce Bay. No live *M. modiolus* were collected during the benthic grab survey.

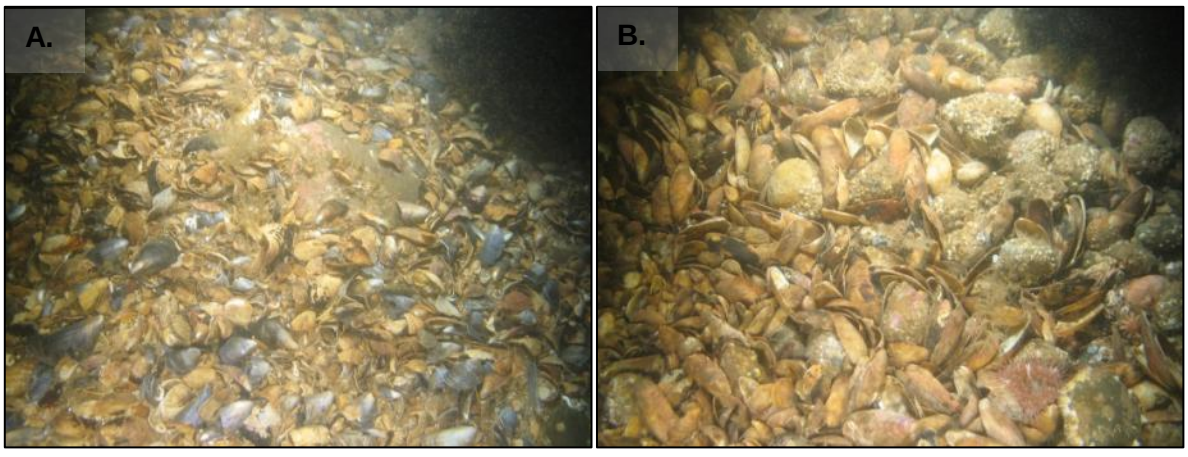


Figure 32. Example images of dead mussel shell aggregations. A. LB518; B. LB513.

4.2. Comparisons with broadscale biotope map

Figures 33 – 35 show the biotopes assigned from the drop-down camera survey overlaid on the broadscale biotope polygons created by ERT Ltd. (2011). There was a good general agreement between the broadscale biotope map and the habitats observed during this survey. However, there were some small scale differences between the two data sets. There are several possible reasons for these differences. Firstly, the broadscale biotope map describes a generalised pattern over the area, whilst the point sources of data from the camera drops were more detailed from a very small scale area. As such, the broadscale map may have missed / omitted some of the patchiness present in the habitats that had been observed during the camera survey. The high quality data gathered from the drop-down camera survey may also have allowed for more detailed assessment of the habitat present, resulting in alternative biotopes being assigned. Some changes in the distribution of the habitats observed may have occurred in the five year period between the ERT survey in 2007 and the present survey in 2012. Finally, designation of biotopes is subjective in its nature, which can lead to some variances between data sets assessed by different people.

At the mouth of Luce Bay (Figure 33) the camera stations within the area of **CR.MCR.EcCr** assigned by ERT Ltd. (2011) were typically part of either **CR.HCR.XFa** or **CR.MCR.EcCr** biotope complexes. The presence of **CR.HCR.XFa** biotopes probably stemmed from differences in the subjective biotope classification of the habitats. In general, both the **CR.HCR.XFa** and **CR.MCR.EcCr** sites were characterised by cobbles and pebbles encrusted with faunal turf and red algae, typically with the **CR.MCR.EcCr** biotopes possessing less turf but more encrusting algae. Broadly speaking these habitats are quite similar, and both were characteristic of stony reef Annex I habitats. Some **SS.SCS.CCS** biotopes were found within this area, suggesting either some change in boundaries over time, habitat patchiness or the accumulation of coarse sediment within gullies. The area marked by ERT as **SS.SCS.CCS** was mainly characterised by **SS.SCS.CCS** biotopes, with some mixed sediment biotopes assigned due to certain combinations of fauna present. The maerl bed was also found within this area. The benthic grab samples taken from this area supported the biotopes assigned during the camera survey.

The area delimited by ERT Ltd. as 'Kelp and seaweed communities on soft sediment' (**SS.SMp.KSwSS**) was characterised by 'Sand or gravel-affected or disturbed kelp and seaweed communities' (**IR.HIR.KSed**) biotopes. These biotopes are broadly characterised by kelp and algae on cobbles with an element of soft sediment present, so are in general agreement. A few mixed sediment biotopes were found on the limits of this ERT Ltd. biotope polygon, suggesting some boundary changes over time. The area delimited as **SS.SMx.IMx** was characterised by further **IR.HIR.KSed** biotopes, suggesting a more patchy mosaic of habitats in this area than indicated by ERT Ltd.

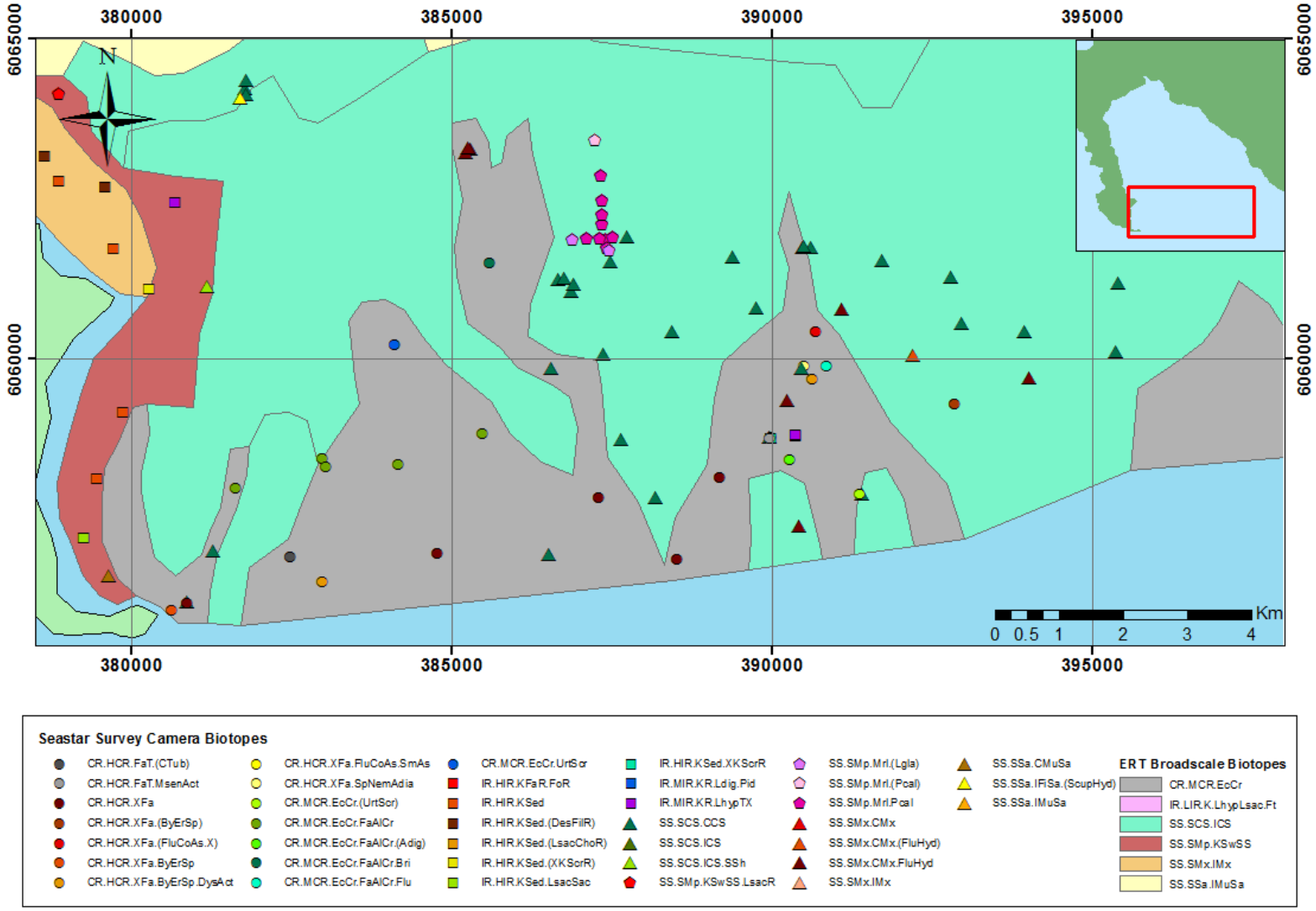


Figure 33. ERT Ltd. broadscale biotope map and Seastar Survey 2012 camera biotopes at the mouth of Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

The camera biotopes along the eastern coastline showed a similar general agreement to the broadscale biotope map (Figure 34). The **SS.SMp.KSwSS** and **IR.HIR.LhypLsac.Ft** polygons designated by ERT Ltd. coincided with **IR.HIR.KSed** camera biotopes. As previously discussed, these biotopes are broadly similar in the substratum and biological communities present. Some **IR.HIR.KSed** camera biotopes were found outside these areas, suggesting some habitat patchiness. There was some discrepancy with the **SS.SMx.IMx** ERT Ltd. boundaries. In these areas the drop-down camera survey found muddy-sand biotopes. However, some stations assigned muddy-sand biotopes from analysis of the camera data were found to be mixed sediment biotopes after analysis of the faunal communities. The centre of the bay probably has patches of mixed sediment and muddy-sand, which will shift over time. The only method of accurately assessing the biotopes in any area of soft sediment in the middle of the bay would be by undertaking macrofaunal analysis of benthic grab samples. The areas designated by ERT as **SS.SSa.IMuSa** were in general agreement with the camera biotopes. Some **SS.SMx.CMx** camera biotopes were assigned on the boundary between an area of **SS.SSa.IMuSa** and **SS.SCS.ICS**, probably representing the transition between the two habitat types.

Figure 35 shows the broadscale biotope map and camera biotopes for the western coastline and head of Luce Bay. The area of **SS.SSa.IMuSa** at the head of the bay agreed with the camera biotopes (also supported by the grab samples), as did the area of **SS.SMx.IMx** in the north west of the bay. The camera biotopes suggested that this area of mixed sediment extended further down the coast than indicated by the ERT Ltd. polygon. This may be representative of changes in sediment distribution over time. The area of mixed sediment in the south west of the bay was characterised by **IR.HIR.KSed** camera biotopes. As mentioned, this could be a result of habitat patchiness, with areas of kelp and seaweed communities surrounded by mixed sediment.

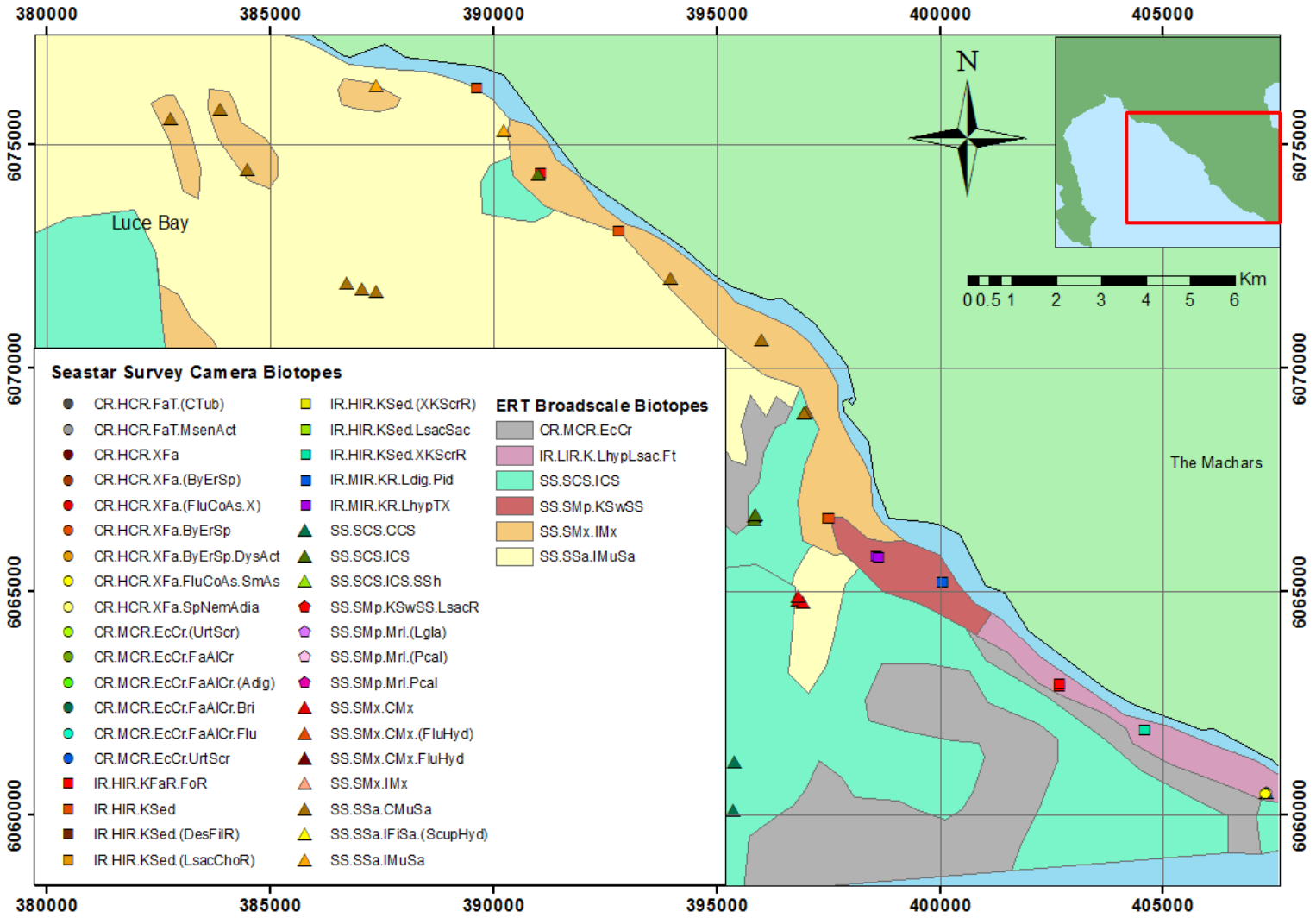


Figure 34. ERT Ltd. broadscale biotope map and Seastar Survey 2012 camera biotopes along the eastern coastline of Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

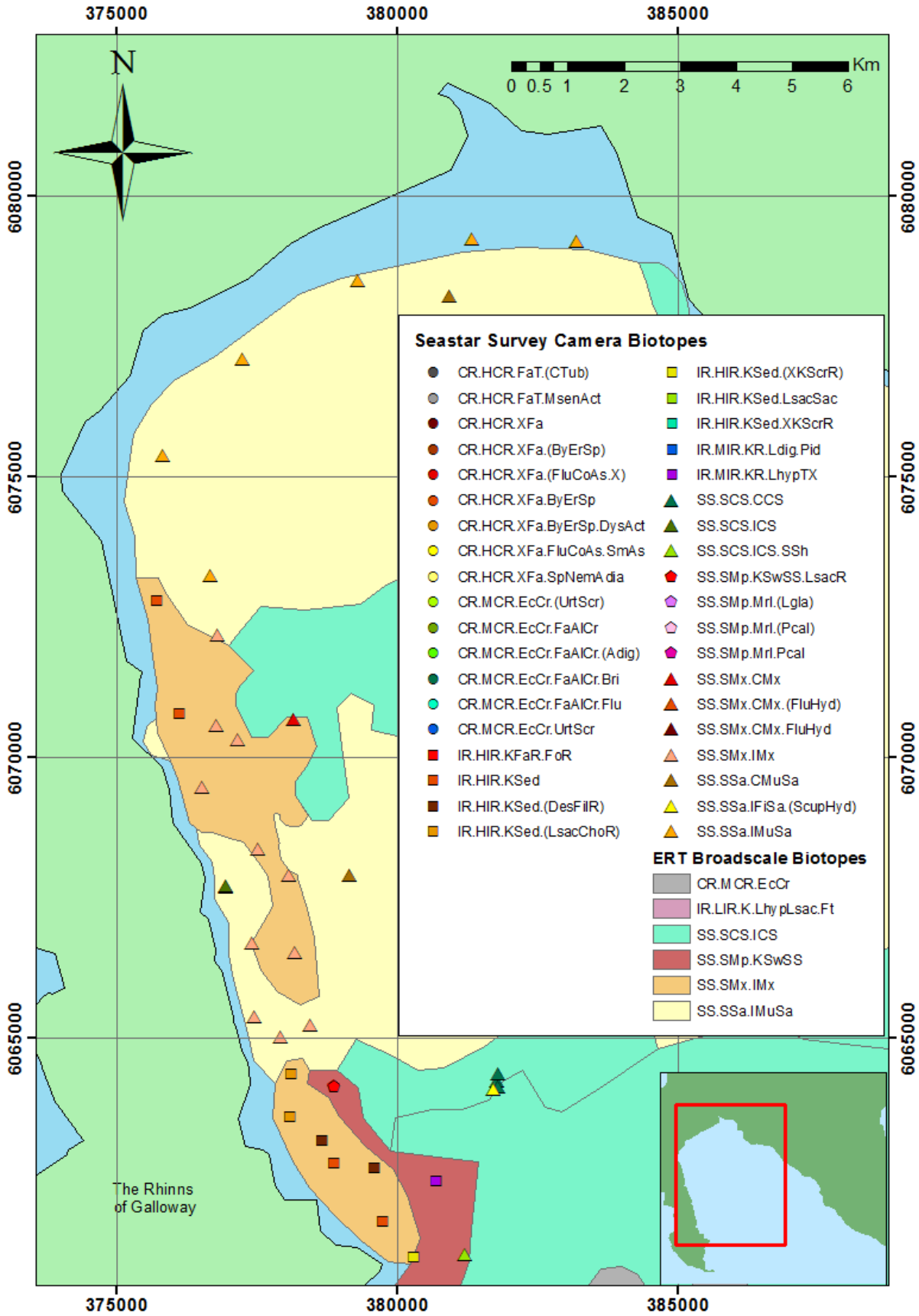


Figure 35. ERT Ltd. broadscale biotope map and Seastar Survey 2012 camera biotopes along the western coastline of Luce Bay. © Crown copyright and database rights [2014] Ordnance Survey 100017908.

4.3. Habitats of conservation importance

During the survey, several habitats of conservation importance were identified. The habitat of principal conservation importance was the maerl bed. Maerl beds provide a spatially complex habitat and are regarded as a Priority Marine Feature (PMF) in Scottish waters (Howson *et al*., 2012), and are on the OSPAR list of threatened and endangered habitats (OSPAR, 2008). The habitat has a high biodiversity and acts as an important nursery area for many marine species (Kamenos *et al.,* 2004).

The Annex I habitat 'stony reefs' was found at the mouth of Luce Bay. These areas have rich epifaunal communities present on stable cobbles and boulders, interspaced and covered by coarse sand and shell material. These reef areas are regarded as being important due their associated high biodiversity.

Patches of the reef building polychaete *Sabellaria alveolata* (**LS.LBR.Sab.Salv**) were found in the intertidal region along the north-eastern coastline of Luce Bay. The **LS.LBR.Sab.Salv** biotope is one of the UK Biodiversity Action Plan Priority Habitats. The biotope has a very limited distribution around the UK, particularly in Scotland. Records for the biotope extend from southern England up into the Irish Sea. The reefs found in Luce Bay and along the northern shore of Solway Firth are the only confirmed *S. alveolata* reefs in the west of Scotland.

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APPENDIX A. VIDEO SURVEY STATIONS

All times are GMT
Positions are WGS84 Latitude and Longitude – Decimal Degrees (DD.DDDDDD)

			SOL				EOL				
Date	Sample #	Station #	Time (GMT)	Position (WGS84)		Depth (m)	Time (GMT)	Position (WGS84)		Depth (m)	Habitat notes / Comments
				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
14/08/2012	309_038#01	LB517	11:12:49	54.758009	4.600132	15.5	11:19:06	54.757728	4.601822	16.4	sand
14/08/2012	309_039#01	LB516	11:39:09	54.772388	4.616507	14.8	11:43:36	54.771938	4.617079	15.0	Repeat ERT station 71; sand
14/08/2012	309_040#01	LB515	11:58:30	54.784287	4.648534	15.9	12:04:14	54.783995	4.649870	15.4	sand
14/08/2012	309_041#01	LB514	12:15:48	54.793416	4.667143	13.4	12:20:53	54.793177	4.668150	14.2	kelp
14/08/2012	309_042#01	LB513	12:39:48	54.804844	4.694956	11.9	12:45:19	54.804473	4.695840	13.4	kelp
14/08/2012	309_043#01	LB512	12:57:14	54.813187	4.708007	11.9	13:02:53	54.812932	4.708958	12.4	Repeat ERT station 56; sand
14/08/2012	309_044#01	LB511	13:13:42	54.821651	4.717743	4.9	13:19:23	54.821350	4.719306	6.7	kelp
14/08/2012	309_045#01	LB510	13:33:38	54.821536	4.752596	10.0	13:39:46	54.821099	4.753028	10.1	Repeat ERT station 54; sand
14/08/2012	309_046#01	LB006	15:04:14	54.737201	4.617338	13.4	15:09:45	54.737547	4.616308	13.3	Repeat Marine Recorder record *Arctica islandica*; sand
14/08/2012	309_047#01	LB004	15:21:18	54.736831	4.617569	13.4	15:26:30	54.736713	4.616508	13.3	Repeat Marine Recorder record *Arctica islandica*; sand
14/08/2012	309_048#01	LB005	15:37:58	54.736190	4.617609	13.4	15:45:30	54.736014	4.615940	13.4	Repeat Marine Recorder record *Arctica islandica*; sand
18/08/2012	309_049#01	LB313	14:07:44	54.704817	4.892059	6.5	14:13:19	54.704896	4.892401	6.3	kelp

Date	Sample #	Station #	SOL				EOL				Habitat notes / Comments
			Time (GMT)	Position (WGS84)		Depth (m)	Time (GMT)	Position (WGS84)		Depth (m)	
				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
18/08/2012	309_050#01	LB315	14:21:21	54.711741	4.892268	6.0	14:26:44	54.711682	4.892717	5.3	kelp
18/08/2012	309_051#01	LB316	14:43:35	54.717606	4.895552	12.0	14:49:42	54.717611	4.896043	11.6	Repeat ERT station 36; sand
18/08/2012	309_052#01	LB209	15:01:21	54.720806	4.902788	10.2	15:06:34	54.721086	4.903138	10.0	sand
18/08/2012	309_053#01	LB210	15:16:46	54.732461	4.904030	10.6	15:22:11	54.732317	4.904896	10.1	mixed sediment
18/08/2012	309_054#01	LB211	15:32:27	54.741378	4.911693	8.0	15:38:00	54.741635	4.911893	7.8	Repeat ERT station 40; mixed sediment
18/08/2012	309_055#01	LB213	15:51:00	54.757145	4.918823	7.7	15:56:31	54.757043	4.919321	6.2	mixed sediment
18/08/2012	309_056#01	LB214	16:07:35	54.768889	4.925789	4.6	16:13:12	54.768826	4.926431	4.2	kelp and cobbles
18/08/2012	309_057#01	LB215	16:26:14	54.786865	4.933015	5.1	16:32:06	54.787193	4.932809	6.2	mixed sediment
18/08/2012	309_058#01	LB205	16:45:04	54.791059	4.918312	8.6	16:50:57	54.791294	4.918735	8.5	Repeat ERT station 14; sand
18/08/2012	309_059#01	LB206	17:01:44	54.781700	4.916039	5.2	17:07:15	54.782106	4.916620	8.6	Repeat ERT station 11; sand
19/08/2012	309_060#01	LB318	09:06:24	54.688473	4.865920	8.1	09:11:34	54.688449	4.865789	8.0	cobbles and red algae
19/08/2012	309_061#01	LB307	09:19:06	54.682916	4.857149	8.6	09:24:36	54.682494	4.857829	6.9	kelp
19/08/2012	309_062#01	LB305	09:35:51	54.665539	4.862631	12.9	09:41:15	54.665062	4.864221	9.5	Repeat ERT station 28; cobbles and red algae
19/08/2012	309_063#01	LB301	10:02:58	54.638012	4.849526	26.6	10:08:38	54.638236	4.849956	27.6	rocky with *Flustra* & seastars
19/08/2012	309_064#01	LB302	10:23:30	54.639150	4.845982	32.2	10:29:35	54.638501	4.846209	32.1	large amounts of mussel shells; seastars

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				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
19/08/2012	309_065#01	LB320	10:49:53	54.646412	4.840108	27.3	10:55:42	54.645887	4.839787	25.5	gravel
19/08/2012	309_066#01	LB425	11:08:55	54.645843	4.821260	29.0	11:14:11	54.645702	4.821087	30.1	coarse sediment; seastars
19/08/2012	309_067#01	LB419	11:42:25	54.646879	4.785660	29.3	11:47:44	54.646846	4.785070	29.4	large amounts of shell material; seastars & *Urticina*
19/08/2012	309_068#01	LB418	12:00:31	54.647189	4.758779	29.0	12:05:44	54.647332	4.758187	29.0	large amounts of mussel shells; seastars
19/08/2012	309_069#01	LB413	12:19:43	54.646914	4.727604	25.2	12:25:22	54.646602	4.727833	25.4	cobbles and shell; echinoderms
19/08/2012	309_070#01	LB107	12:39:09	54.655428	4.733089	26.3	12:44:58	54.655231	4.734057	26.3	large amount of shell material
19/08/2012	309_071#01	LB106	12:58:58	54.663479	4.741816	25.2	13:04:26	54.663721	4.743481	25.5	cobbles
19/08/2012	309_072#01	LB103	13:29:58	54.684143	4.754928	24.3	13:31:52	54.684168	4.756334	24.3	large amount of shell material; line abandoned - too much tide
19/08/2012	309_073#01	LB417	13:48:53	54.703758	4.780036	22.8	13:54:09	54.703305	4.781187	22.2	sand and cobbles
19/08/2012	309_074#01	LB022	14:16:16	54.710108	4.836252	21.0	14:21:35	54.709506	4.835406	21.2	sand
19/08/2012	309_075#01	LB002									line not attempted due to tide
19/08/2012	309_076#01	LB314	15:00:27	54.710039	4.880184	12.7	15:05:51	54.709393	4.881370	10.0	mixed sediment; red algae
19/08/2012	309_077#01	LB312	15:14:36	54.701251	4.883231	7.3	15:19:56	54.701251	4.882353	7.7	kelp
19/08/2012	309_078#01	LB311	15:25:36	54.697748	4.879700	8.5	15:30:55	54.697465	4.878749	8.5	algal community
19/08/2012	309_079#01	LB310	15:39:32	54.697191	4.868507	8.5	15:44:58	54.696384	4.868908	8.1	coarse sediment

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				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
19/08/2012	309_080#01	LB309	15:58:38	54.695239	4.851481	11.8	16:04:01	54.694414	4.851246	14.4	kelp
19/08/2012	309_081#01	LB306	16:16:20	54.683505	4.843018	13.1	16:21:02	54.682547	4.843291	13.4	Repeat ERT station 64; large amount of shell material
20/08/2012	309_082#01	LB317	09:19:29	54.719635	4.887392	10.7	09:24:15	54.720058	4.886758	10.8	mixed sediment
20/08/2012	309_083#01	LB201	09:58:28	54.731099	4.892242	11.7	10:03:48	54.731273	4.891637	11.9	Repeat ERT station 43; mixed sediment; scallop
20/08/2012	309_084#01	LB208	10:14:23	54.743844	4.877610	13.4	10:19:38	54.744107	4.876922	13.6	sand; echinoderms
20/08/2012	309_085#01	LB207	10:29:48	54.743459	4.894400	12.3	10:35:15	54.743825	4.893549	13.5	Repeat ERT station 41; mixed sediment; brittlestars
20/08/2012	309_086#01	LB212	10:42:00	54.747616	4.903132	11.5	10:47:23	54.747961	4.902166	12.5	mixed sediment; brittlestars
20/08/2012	309_087#01	LB203	11:04:44	54.764957	4.909637	12.1	11:10:22	54.765157	4.908870	12.3	Repeat ERT station 7; mixed sediment
24/08/2012	309_088#01	LB417	09:27:28	54.703886	4.780707	18.5	09:32:33	54.703809	-4.780372	18.0	cobbles on coarse sand; *Flustra*, *Urticina*
24/08/2012	309_089#01	LB109	09:52:40	54.691628	4.746733	17.3	10:03:08	54.691918	4.747835	16.8	maerl observed
24/08/2012	309_090#01	LB111	10:12:07	54.692020	4.745122	17.2	10:22:17	54.691708	4.745987	17.2	maerl observed
24/08/2012	309_091#01	LB112	10:27:27	54.691800	4.748152	16.7	10:37:37	54.691827	4.749100	16.0	maerl; echinoderms
24/08/2012	309_092#01	LB114	11:07:51	54.691648	4.751365	16.0	11:13:05	54.691802	4.750876	16.1	maerl; echinoderms
24/08/2012	309_093#01	LB113	11:20:57	54.692078	4.741548	18.3	11:26:13	54.692006	4.741253	18.5	coarse sediment
24/08/2012	309_094#01	LB104	11:39:52	54.689534	4.716059	20.3	11:45:10	54.689943	4.715123	20.3	large amounts of shell material

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				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
24/08/2012	309_095#01	LB409	11:53:33	54.691152	4.699013	20.0	11:58:25	54.691107	4.696712	19.7	line abandoned - too much tide
24/08/2012	309_096#01	LB007	12:33:16	54.780284	4.750951	14.2	12:38:33	54.779941	4.751275	14.3	Repeat Marine Recorder record *Modiolus*; muddy-sand; brittlestars
24/08/2012	309_097#01	LB008	12:54:32	54.780640	4.756095	14.6	12:59:49	54.781320	4.755909	14.7	Repeat Marine Recorder record *Modiolus*; muddy-sand; brittlestars
24/08/2012	309_098#01	LB009	13:08:00	54.781773	4.761489	15.1	13:13:16	54.781675	4.761841	15.2	Repeat ERT station 61; muddy-sand; brittlestars
24/08/2012	309_099#01	LB014	13:29:49	54.804054	4.796809	15.3	13:34:56	54.803829	4.796408	15.3	Repeat ERT station 50; large numbers of gastropod shells
24/08/2012	309_100#01	LB013	13:44:37	54.816010	4.807052	14.3	13:49:50	54.815821	4.806824	13.4	muddy-sand; brittlestars
24/08/2012	309_101#01	LB015	13:58:15	54.813953	4.824039	14.6	14:03:58	54.814005	4.823933	14.6	sandy mud; burrows; brittlestars
24/08/2012	309_102#01	LB020	14:17:10	54.846060	4.819420	7.1	14:22:27	54.845985	4.818937	7.2	organic "mat" on sediment
24/08/2012	309_103#01	LB019	14:32:58	54.846115	4.848438	5.5	14:38:05	54.846208	4.847968	5.5	organic "mat" on sediment
24/08/2012	309_104#01	LB021	14:47:38	54.836848	4.854076	11.6	14:52:46	54.836591	4.853819	11.8	Repeat ERT station 45; sandy mud; burrows; brittlestars
24/08/2012	309_105#01	LB018	15:00:44	54.838934	4.879521	6.1	15:05:52	54.838854	4.879001	6.5	organic "mat" on sediment
24/08/2012	309_106#01	LB017	15:16:36	54.825793	4.911127	6.7	15:21:42	54.825931	4.910779	6.5	organic "mat" on sediment
24/08/2012	309_107#01	LB016	15:33:51	54.810100	4.932443	8.3	15:38:59	54.810198	4.931834	8.5	organic "mat" on sediment
24/08/2012	309_108#01	LB202	16:06:23	54.768423	4.894030	14.7	16:11:33	54.768124	4.893953	14.7	Repeat ERT station 37; mixed sediment
24/08/2012	309_109#01	LB204	16:21:50	54.767170	4.915605	12.1	16:27:07	54.767330	4.915264	12.1	Repeat ERT station 8; coarse sediment

Date	Sample #	Station #	SOL				EOL				Habitat notes / Comments
			Time (GMT)	Position (WGS84)		Depth (m)	Time (GMT)	Position (WGS84)		Depth (m)	
				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
25/08/2012	309_110#01	LB101	10:48:49	54.685859	4.758047	24.3	10:53:58	54.685483	4.758579	25.0	BGS Maerl record; coarse sediment and shell material; urchins
25/08/2012	309_111#01	LB102	11:05:10	54.685906	4.756572	21.5	11:10:28	54.685325	4.755986	20.3	BGS Maerl record; coarse sediment and shell material; urchins
25/08/2012	309_112#01	LB103	11:19:09	54.685194	4.754231	19.2	11:24:22	54.684889	4.754279	19.3	BGS Maerl record; large amounts of shell material
25/08/2012	309_113#01	LB105	11:38:09	54.678794	4.730288	20.2	11:43:34	54.678573	4.729484	19.9	coarse sediment and shell material; *Flustra*
25/08/2012	309_114#01	LB011	12:26:38	54.719609	4.600202	13.6	12:31:50	54.719188	4.600174	13.7	Repeat Marine Recorder record *Modiolus*; large amount of shell material; *Alcyonidium diaphanum;* sea slug eggs
25/08/2012	309_115#01	LB010	12:37:45	54.720154	4.601539	13.6	12:43:03	54.719758	4.600408	13.6	Repeat Marine Recorder record *Modiolus*; large amount of shell material; *Alcyonidium diaphanum*
25/08/2012	309_116#01	LB012	12:49:16	54.720933	4.601526	14.6	12:54:27	54.720362	4.600644	13.6	Repeat Marine Recorder record *Modiolus*; large amount of shell material; bryozoans
25/08/2012	309_117#01	LB518	13:08:22	54.736614	4.592105	9.0	13:11:15	54.736344	4.591713	8.7	Repeat ERT station 73; coarse sediment; algal community
25/08/2012	309_117#02	LB518	13:58:28	54.736670	4.591578	9.4	14:03:43	54.736542	4.590792	9.0	coarse sediment; algal community
25/08/2012	309_118#01	LB508	14:47:09	54.729241	4.575033	8.9	14:49:55	54.729382	4.574308	9.0	kelp; lost camera connection at end of line - station abandoned
05/09/2012	309_119#01	LB003	08:07:32	54.712645	4.835007	17.6	08:12:48	54.712443	4.834143	17.8	Repeat ERT station 65; sand
05/09/2012	309_120#01	LB001	08:20:15	54.711550	4.835169	17.3	08:25:31	54.711369	4.835190	17.6	Repeat ERT station 65; sand
05/09/2012	309_121#01	LB002	08:33:10	54.710622	4.834897	17.6	08:38:26	54.710466	4.835427	17.3	Repeat ERT station 65; sand; bryozoans
05/09/2012	309_122#01	LB422	09:04:15	54.676104	4.797436	19.6	09:09:35	54.676055	4.797762	18.9	cobbles

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				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
05/09/2012	309_123#01	LB423	09:36:28	54.659756	4.814168	25.2	09:39:29	54.660467	4.814223	24.7	Repeat ERT station 16; line abandoned - too much tide
05/09/2012	309_124#01	LB403	10:48:24	54.674625	4.692724	18.1	10:58:42	54.673984	4.692600	19.0	rocky reef
05/09/2012	309_125#01	LB406	11:18:42	54.664667	4.699518	13.8	11:21:40	54.664454	4.699215	17.7	rocky reef; lost camera connection - line abandoned
05/09/2012	309_125#02	LB406									lost camera connection before SOL - line abandoned
05/09/2012	309_126#01	LB304	13:39:27	54.656179	4.868541	13.5	13:46:08	54.655914	4.868132	14.0	Repeat ERT station 25; algal community
05/09/2012	309_127#01	LB303	13:53:32	54.647829	4.871321	12.8	13:59:02	54.647994	4.871788	12.3	Repeat ERT station 22;kelp
08/09/2012	309_128#01	LB308	09:52:28	54.655305	4.834892	21.9	09:57:40	54.655677	4.835302	22.3	cobbles; urchins & seastars
08/09/2012	309_129#01	LB423	10:10:23	54.658637	4.813204	25.2	10:15:46	54.658482	4.813312	25.2	Repeat ERT station 16; cobbles; urchins & seastars
08/09/2012	309_130#01	LB420	10:28:28	54.642416	4.813496	30.7	10:34:00	54.642165	4.813513	28.4	cobbles and boulders; anemones
08/09/2012	309_131#01	LB424	10:53:22	54.659302	4.795831	22.5	10:58:53	54.659057	4.795276	21.8	cobbles
08/09/2012	309_132#01	LB421	11:09:48	54.663855	4.775452	21.3	11:15:54	54.663719	4.775118	21.2	Repeat ERT station 17; cobbles; urchins & anemones
08/09/2012	309_133#01	LB414	11:34:09	54.655250	4.746856	23.9	11:39:35	54.655449	4.746326	23.8	coarse sediment; *Urticina* & *Crossaster papposus*
08/09/2012	309_134#01	LB412	12:01:06	54.658607	4.717892	21.1	12:06:22	54.658678	4.716703	21.1	coarse sediment; *Urticina*
08/09/2012	309_135#01	LB411	12:18:28	54.651946	4.698180	22.5	12:24:07	54.651864	4.697350	22.6	coarse sediment
08/09/2012	309_136#01	LB408	12:36:38	54.661305	4.701000	22.2	12:46:56	54.661605	4.699326	21.4	rocky reef as predicted

			SOL				EOL				
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				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
08/09/2012	309_137#01	LB407	12:57:33	54.664430	4.705914	15.4	13:03:03	54.664162	4.705753	9.9	large amount of shell material followed by rocky reef; anemones, urchins, red algae
08/09/2012	309_138#01	LB406	13:09:48	54.664772	4.699746	11.7	13:14:40	54.664101	4.700089	13.8	kelp; video footage cut out at EOL
08/09/2012	309_139#01	LB405	13:23:43	54.669606	4.702014	20.5	13:29:04	54.669443	4.702019	20.8	coarse sediment; urchins & *Urticina*
08/09/2012	309_140#01	LB401	13:41:34	54.672705	4.695986	20.2	13:51:44	54.672105	4.695585	20.5	Repeat ERT station 18; rocky reef as predicted; anemones & urchins
08/09/2012	309_141#01	LB404	13:59:24	54.674418	4.698117	21.3	14:04:38	54.674079	4.698598	20.6	coarse sediment
08/09/2012	309_142#01	LB410	14:20:47	54.656680	4.683193	22.6	14:26:04	54.656539	4.684099	22.7	coarse sediment; *Urticina*
08/09/2012	309_143#01	LB610	14:40:32	54.669617	4.661428	24.1	14:45:44	54.669506	4.660507	24.8	coarse sediment
08/09/2012	309_144#01	LB609	14:55:40	54.673641	4.643313	27.6	15:00:54	54.673457	4.642719	27.5	pebbles; *Crossaster papposus*
08/09/2012	309_145#01	LB608	15:13:01	54.677468	4.622473	27.5	15:18:14	54.677237	4.622469	28.8	coarse sediment; scallop
08/09/2012	309_146#01	LB607	15:31:33	54.687195	4.622430	28.8	15:36:53	54.687021	4.622312	28.4	sand; brittlestars
08/09/2012	309_147#01	LB602	15:50:37	54.680086	4.644751	22.5	16:00:49	54.679401	4.645514	25.9	Repeat ERT station 20; gravel
08/09/2012	309_148#01	LB603	16:10:02	54.681026	4.659987	23.3	16:15:12	54.680641	4.660024	23.9	gravel and shell material
10/09/2012	309_149#01	LB319	08:54:17	54.642582	4.865114	14.2	08:59:29	54.642743	4.864982	14.4	sand; brittlestars
10/09/2012	309_150#01	LB415	09:26:52	54.673200	4.759269	28.5	09:32:04	54.673178	4.759929	32.8	large amount of shell material
10/09/2012	309_151#01	LB108	09:42:00	54.675455	4.746598	23.1	09:47:21	54.675469	4.747451	22.6	shell and gravel

			SOL				EOL				
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				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
10/09/2012	309_152#01	LB110	10:05:16	54.682401	4.709765	20.5	10:10:14	54.682469	4.710109	20.7	coarse sediment; video footage lost towards EOL
10/09/2012	309_153#01	LB402	10:28:13	54.679269	4.695242	19.7	10:33:41	54.679010	4.695328	19.4	cobbles; *Flustra*
10/09/2012	309_154#01	LB601	10:46:54	54.676382	4.671631	21.1	10:57:04	54.676738	4.671325	21.4	Repeat ERT station 19; coarse sediment and shell
10/09/2012	309_155#01	LB606	11:06:26	54.687414	4.662824	21.8	11:11:40	54.687486	4.662411	21.3	sand
10/09/2012	309_156#01	LB605	11:22:18	54.689497	4.679619	22.0	11:27:34	54.689716	4.679555	21.9	coarse sediment and shell
10/09/2012	309_157#01	LB604	11:46:51	54.682666	4.689262	21.1	11:52:07	54.682838	4.689451	21.2	large amount of shell material
10/09/2012	309_158#01	LB409	12:02:25	54.691262	4.698654	20.2	12:07:47	54.691120	4.699235	20.1	coarse sediment
10/09/2012	309_159#01	LB116	12:27:59	54.690522	4.746359	18.2	12:38:13	54.689836	4.745610	18.5	maerl
10/09/2012	309_160#01	LB118	12:46:09	54.688421	4.745625	19.2	12:51:23	54.688032	4.745551	19.5	coarse sediment; no maerl
10/09/2012	309_161#01	LB115	12:59:18	54.693763	4.747673	17.5	13:10:08	54.693007	4.747351	17.6	maerl
10/09/2012	309_162#01	LB119	13:19:26	54.695034	4.747952	17.3	13:24:42	54.694780	4.747270	17.3	maerl
10/09/2012	309_163#01	LB120	13:34:30	54.697123	4.747902	16.7	13:39:42	54.696927	4.747295	16.8	maerl
10/09/2012	309_164#01	LB121	13:47:59	54.700538	4.748381	16.3	13:53:12	54.700310	4.748862	16.3	maerl
10/09/2012	309_165#01	LB122	14:01:21	54.705505	4.750116	18.1	14:06:33	54.705176	4.749436	17.8	small amount of maerl
10/09/2012	309_166#01	LB117	14:18:31	54.691490	4.754751	18.0	14:23:45	54.691468	4.754342	17.2	some maerl; large amount of shell material

			SOL				EOL				
Date	Sample #	Station #	Time (GMT)	Position (WGS84)		Depth (m)	Time (GMT)	Position (WGS84)		Depth (m)	Habitat notes / Comments
				Latitude (N)	Longitude (W)			Latitude (N)	Longitude (W)		
10/09/2012	309_167#01	LB416	14:37:58	54.687852	4.774811	20.0	14:42:07	54.687621	4.774351	20.1	brittlestar bed on cobbles and sand
10/09/2012	309_168#01	LB508	15:28:43	54.729189	4.574290	8.3	15:35:10	54.728372	4.574079	28.9	kelp
10/09/2012	309_169#01	LB509	15:44:42	54.724320	4.551859	10.1	15:50:06	54.724002	4.551593	11.1	coarse sediment; algal community
10/09/2012	309_170#01	LB519	16:12:19	54.704081	4.510401	14.4	16:16:04	54.703921	4.510579	15.3	cobbles and boulders; *Esperiopsis fucorum; camera connection lost - line abandoned*
10/09/2012	309_170#02	LB519	16:36:23	54.704376	4.510302	12.7	16:42:42	54.703980	4.510090	14.3	cobbles and boulders; red algae
10/09/2012	309_171#01	LB520	16:54:07	54.695499	4.480223	11.6	16:58:50	54.695172	4.480214	12.3	Repeat ERT station 31; kelp
10/09/2012	309_172#01	LB521	17:17:38	54.683409	4.437551	19.7	17:23:44	54.683215	-4.438014	19.7	sand and cobbles; large amounts of *Flustra* and *Urticina*

APPENDIX B. VIDEO SURVEY PHOTOGRAPH POSITIONS

All times are GMT
Positions are WGS84 Latitude and Longitude – Decimal Degrees (DD.DDDDDD)

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
14/08/2012	309_038#01	LB517	1	-				Clapper Board
14/08/2012	309_038#01	LB517	2	11:13:45	54.757951	4.600341	15.7	
14/08/2012	309_038#01	LB517	3	11:14:37	54.757872	4.600606	15.8	
14/08/2012	309_038#01	LB517	4	11:15:05	54.757891	4.600731	16.1	
14/08/2012	309_038#01	LB517	5	11:15:58	54.757836	4.601000	16.5	
14/08/2012	309_038#01	LB517	6	11:16:25	54.757828	4.601130	16.3	
14/08/2012	309_038#01	LB517	7	11:17:20	54.757820	4.601377	16.3	
14/08/2012	309_038#01	LB517	8	11:18:48	54.757748	4.601754	16.3	
14/08/2012	309_039#01	LB516	1	-				Clapper Board
14/08/2012	309_039#01	LB516	2	11:39:48	54.772425	4.616391	14.8	
14/08/2012	309_039#01	LB516	3	11:40:00	54.772415	4.616401	14.8	
14/08/2012	309_039#01	LB516	4	11:40:36	54.772358	4.616595	14.8	
14/08/2012	309_039#01	LB516	5	11:41:13	54.772255	4.616771	14.8	
14/08/2012	309_039#01	LB516	6	11:42:01	54.772119	4.616928	14.8	
14/08/2012	309_039#01	LB516	7	11:42:11	54.772098	4.616918	14.8	
14/08/2012	309_039#01	LB516	8	11:42:50	54.772000	4.616953	14.8	
14/08/2012	309_039#01	LB516	9	11:43:17	54.771947	4.617033	14.8	
14/08/2012	309_040#01	LB515	1	-				Clapper Board
14/08/2012	309_040#01	LB515	2	11:58:46	54.784295	4.648650	15.9	
14/08/2012	309_040#01	LB515	3	11:59:29	54.784229	4.648881	15.7	
14/08/2012	309_040#01	LB515	4	11:59:50	54.784229	4.648976	15.7	
14/08/2012	309_040#01	LB515	5	12:00:27	54.784217	4.649114	15.8	
14/08/2012	309_040#01	LB515	6	12:01:01	54.784184	4.649172	15.5	
14/08/2012	309_040#01	LB515	7	12:01:38	54.784161	4.649339	15.7	
14/08/2012	309_040#01	LB515	8	12:02:01	54.784140	4.649479	15.6	
14/08/2012	309_040#01	LB515	9	12:02:39	54.784153	4.649597	15.5	
14/08/2012	309_040#01	LB515	10	12:04:03	54.783972	4.649903	15.4	
14/08/2012	309_041#01	LB514	1	-				Clapper Board
14/08/2012	309_041#01	LB514	2	12:16:01	54.793410	4.667165	13.2	
14/08/2012	309_041#01	LB514	3	12:16:22	54.793386	4.667240	13.6	
14/08/2012	309_041#01	LB514	4	12:16:48	54.793375	4.667329	13.6	
14/08/2012	309_041#01	LB514	5	12:17:22	54.793358	4.667395	14.0	
14/08/2012	309_041#01	LB514	6	12:17:58	54.793283	4.667507	13.8	
14/08/2012	309_041#01	LB514	7	12:18:27	54.793251	4.667606	14.0	
14/08/2012	309_041#01	LB514	8	12:19:00	54.793211	4.667700	14.4	
14/08/2012	309_041#01	LB514	9	12:19:37	54.793220	4.667821	14.2	
14/08/2012	309_041#01	LB514	10	12:20:40	54.793191	4.668086	14.2	
14/08/2012	309_042#01	LB513	1	-				Clapper Board
14/08/2012	309_042#01	LB513	2	12:40:10	54.804826	4.695046	11.9	
14/08/2012	309_042#01	LB513	3	12:40:37	54.804793	4.695123	11.9	
14/08/2012	309_042#01	LB513	4	12:41:00	54.804769	4.695212	12.1	
14/08/2012	309_042#01	LB513	5	12:41:40	54.804746	4.695319	12.1	
14/08/2012	309_042#01	LB513	6	12:42:07	54.804717	4.695391	12.3	
14/08/2012	309_042#01	LB513	7	12:42:41	54.804676	4.695419	12.4	
14/08/2012	309_042#01	LB513	8	12:43:36	54.804627	4.695591	12.9	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
14/08/2012	309_042#01	LB513	9	12:44:10	54.804573	4.695641	13.1	
14/08/2012	309_042#01	LB513	10	12:45:06	54.804466	4.695775	13.2	
14/08/2012	309_043#01	LB512	1	-				Clapper Board
14/08/2012	309_043#01	LB512	2	12:57:26	54.813178	4.708016	11.9	
14/08/2012	309_043#01	LB512	3	12:57:53	54.813128	4.707897	11.8	
14/08/2012	309_043#01	LB512	4	12:58:40	54.813079	4.707841	11.9	
14/08/2012	309_043#01	LB512	5	12:59:24	54.813043	4.707986	12.0	
14/08/2012	309_043#01	LB512	6	13:00:16	54.812997	4.708260	12.1	
14/08/2012	309_043#01	LB512	7	13:00:44	54.812961	4.708362	12.1	
14/08/2012	309_043#01	LB512	8	13:01:32	54.812922	4.708595	12.2	
14/08/2012	309_043#01	LB512	9	13:02:23	54.812936	4.708838	12.3	
14/08/2012	309_043#01	LB512	10	13:02:44	54.812930	4.708927	12.3	
14/08/2012	309_044#01	LB511	1	-				Clapper Board
14/08/2012	309_044#01	LB511	2	13:14:02	54.821610	4.717739	4.8	
14/08/2012	309_044#01	LB511	3	13:15:01	54.821531	4.718040	5.2	
14/08/2012	309_044#01	LB511	4	13:15:37	54.821485	4.718208	5.5	
14/08/2012	309_044#01	LB511	5	13:16:24	54.821404	4.718359	6.2	
14/08/2012	309_044#01	LB511	6	13:18:24	54.821318	4.718970	6.2	
14/08/2012	309_044#01	LB511	7	13:19:14	54.821343	4.719247	6.5	
14/08/2012	309_045#01	LB510	1	-				Clapper Board
14/08/2012	309_045#01	LB510	2	13:34:41	54.821455	4.752896	10.1	
14/08/2012	309_045#01	LB510	3	13:35:16	54.821413	4.752929	10.1	
14/08/2012	309_045#01	LB510	4	13:35:44	54.821379	4.753006	10.1	
14/08/2012	309_045#01	LB510	5	13:36:27	54.821348	4.753007	10.0	
14/08/2012	309_045#01	LB510	6	13:37:07	54.821321	4.753012	10.1	
14/08/2012	309_045#01	LB510	7	13:37:56	54.821225	4.753114	10.1	
14/08/2012	309_045#01	LB510	8	13:39:03	54.821102	4.753280	10.2	
14/08/2012	309_045#01	LB510	9	13:39:40	54.821104	4.753017	10.2	
14/08/2012	309_046#01	LB006	1	-				Clapper Board
14/08/2012	309_046#01	LB006	2	15:06:02	54.737310	4.616947	13.5	
14/08/2012	309_046#01	LB006	3	15:06:37	54.737330	4.616740	13.4	
14/08/2012	309_046#01	LB006	4	15:07:26	54.737417	4.616559	13.4	
14/08/2012	309_046#01	LB006	5	15:07:54	54.737465	4.616528	13.2	
14/08/2012	309_046#01	LB006	6	15:08:27	54.737492	4.616519	13.4	
14/08/2012	309_046#01	LB006	7	15:08:59	54.737516	4.616452	7.1	
14/08/2012	309_046#01	LB006	8	15:09:37	54.737552	4.616341	13.2	
14/08/2012	309_047#01	LB004	1	-				Clapper Board
14/08/2012	309_047#01	LB004	2	15:21:37	54.736817	4.617425	13.4	
14/08/2012	309_047#01	LB004	3	15:22:06	54.736808	4.617305	13.7	
14/08/2012	309_047#01	LB004	4	15:23:29	54.736785	4.616972	13.6	
14/08/2012	309_047#01	LB004	5	15:24:05	54.736793	4.616858	13.8	
14/08/2012	309_047#01	LB004	6	15:24:42	54.736771	4.616715	13.4	
14/08/2012	309_047#01	LB004	7	15:25:23	54.736723	4.616618	13.4	
14/08/2012	309_047#01	LB004	8	15:25:59	54.736716	4.616573	13.4	
14/08/2012	309_047#01	LB004	9	15:26:25	54.736709	4.616519	13.3	
14/08/2012	309_048#01	LB005	1	-				Clapper Board
14/08/2012	309_048#01	LB005	2	15:40:44	54.736057	4.616838	13.7	
14/08/2012	309_048#01	LB005	3	15:41:16	54.736039	4.616693	13.2	
14/08/2012	309_048#01	LB005	4	15:42:11	54.736027	4.616550	13.4	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
14/08/2012	309_048#01	LB005	5	15:42:50	54.735995	4.616434	13.4	
14/08/2012	309_048#01	LB005	6	15:43:30	54.735972	4.616347	13.1	
14/08/2012	309_048#01	LB005	7	15:44:10	54.735965	4.616222	13.2	
14/08/2012	309_048#01	LB005	8	15:44:46	54.736009	4.616082	13.2	
14/08/2012	309_048#01	LB005	9	15:45:21	54.736027	4.615978	13.4	
18/08/2012	309_049#01	LB313	1	-				Clapper Board
18/08/2012	309_049#01	LB313	2	-				Clapper Board
18/08/2012	309_049#01	LB313	3	14:07:56	54.704816	4.892069	6.0	
18/08/2012	309_049#01	LB313	4	14:08:33	54.704823	4.892052	6.5	
18/08/2012	309_049#01	LB313	5	14:09:06	54.704836	4.892080	6.5	
18/08/2012	309_049#01	LB313	6	14:10:02	54.704850	4.892075	6.7	
18/08/2012	309_049#01	LB313	7	14:10:53	54.704857	4.892120	6.8	
18/08/2012	309_049#01	LB313	8	14:11:34	54.704884	4.892170	6.5	
18/08/2012	309_049#01	LB313	9	14:12:05	54.704897	4.892210	6.5	
18/08/2012	309_049#01	LB313	10	14:12:32	54.704903	4.892280	6.4	
18/08/2012	309_049#01	LB313	11	14:13:12	54.704894	4.892380	6.6	
18/08/2012	309_050#01	LB315	1	-				Clapper Board
18/08/2012	309_050#01	LB315	2	14:22:03	54.711730	4.892392	5.7	
18/08/2012	309_050#01	LB315	3	14:22:35	54.711704	4.892392	6.0	
18/08/2012	309_050#01	LB315	4	14:23:37	54.711696	4.892554	6.1	
18/08/2012	309_050#01	LB315	5	14:24:09	54.711693	4.892602	5.7	
18/08/2012	309_050#01	LB315	6	14:24:39	54.711697	4.892629	5.3	
18/08/2012	309_050#01	LB315	7	14:25:13	54.711715	4.892677	5.8	
18/08/2012	309_050#01	LB315	8	14:26:13	54.711700	4.892711	5.9	
18/08/2012	309_050#01	LB315	9	14:26:35	54.711694	4.892739	5.7	
18/08/2012	309_051#01	LB316	1	-				Clapper Board
18/08/2012	309_051#01	LB316	2	14:45:24	54.717551	4.895827	11.8	
18/08/2012	309_051#01	LB316	3	14:46:01	54.717552	4.895849	11.8	
18/08/2012	309_051#01	LB316	4	14:46:33	54.717559	4.895940	11.8	
18/08/2012	309_051#01	LB316	5	14:47:52	54.717582	4.896001	11.9	
18/08/2012	309_051#01	LB316	6	14:48:35	54.717580	4.896078	11.7	
18/08/2012	309_051#01	LB316	7	14:48:54	54.717593	4.896098	11.7	
18/08/2012	309_051#01	LB316	8	14:49:27	54.717610	4.896040	11.6	
18/08/2012	309_052#01	LB209	1	-				Clapper Board
18/08/2012	309_052#01	LB209	2	15:01:40	54.720823	4.902787	10.2	
18/08/2012	309_052#01	LB209	3	15:02:08	54.720845	4.902833	10.1	
18/08/2012	309_052#01	LB209	4	15:02:56	54.720885	4.902863	10.2	
18/08/2012	309_052#01	LB209	5	15:03:40	54.720924	4.902905	10.1	
18/08/2012	309_052#01	LB209	6	15:04:17	54.720964	4.902916	10.2	
18/08/2012	309_052#01	LB209	7	15:05:18	54.721013	4.902976	10.0	
18/08/2012	309_052#01	LB209	8	15:06:20	54.721073	4.903101	10.1	
18/08/2012	309_053#01	LB210	1	-				Clapper Board
18/08/2012	309_053#01	LB210	2	15:17:07	54.732434	4.904108	10.3	
18/08/2012	309_053#01	LB210	3	15:19:07	54.732369	4.904450	10.2	
18/08/2012	309_053#01	LB210	4	15:19:33	54.732342	4.904557	10.2	
18/08/2012	309_053#01	LB210	5	15:20:04	54.732326	4.904573	10.3	
18/08/2012	309_053#01	LB210	6	15:20:59	54.732317	4.904719	10.2	
18/08/2012	309_053#01	LB210	7	15:21:34	54.732328	4.904781	10.2	
18/08/2012	309_053#01	LB210	8	15:22:02	54.732323	4.904875	10.0	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
18/08/2012	309_054#01	LB211	1	-				Clapper Board
18/08/2012	309_054#01	LB211	2	15:32:48	54.741440	4.911725	8.1	
18/08/2012	309_054#01	LB211	3	15:33:21	54.741414	4.911831	8.1	
18/08/2012	309_054#01	LB211	4	15:34:27	54.741474	4.911462	8.2	
18/08/2012	309_054#01	LB211	5	15:35:41	54.741532	4.911675	8.1	
18/08/2012	309_054#01	LB211	6	15:36:58	54.741524	4.911777	7.8	
18/08/2012	309_054#01	LB211	7	15:37:28	54.741557	4.911780	7.9	
18/08/2012	309_055#01	LB213	1	-				Clapper Board
18/08/2012	309_055#01	LB213	2	15:51:17	54.757141	4.918890	7.5	
18/08/2012	309_055#01	LB213	3	15:52:10	54.757158	4.919091	7.4	
18/08/2012	309_055#01	LB213	4	15:52:44	54.757178	4.919189	7.5	
18/08/2012	309_055#01	LB213	5	15:53:13	54.757194	4.919262	7.3	
18/08/2012	309_055#01	LB213	6	15:53:55	54.757140	4.919354	7.2	
18/08/2012	309_055#01	LB213	7	15:54:59	54.757029	4.919491	7.3	
18/08/2012	309_055#01	LB213	8	15:55:25	54.756995	4.919388	7.4	
18/08/2012	309_055#01	LB213	9	15:55:55	54.757021	4.919279	7.3	
18/08/2012	309_055#01	LB213	10	15:56:26	54.757044	4.919309	6.6	
18/08/2012	309_056#01	LB214	1	-				Clapper Board
18/08/2012	309_056#01	LB214	2	16:08:20	54.768773	4.925710	4.5	
18/08/2012	309_056#01	LB214	3	16:09:27	54.768717	4.925922	4.3	
18/08/2012	309_056#01	LB214	4	16:09:58	54.768747	4.926064	4.1	
18/08/2012	309_056#01	LB214	5	16:10:24	54.768772	4.926127	4.6	
18/08/2012	309_056#01	LB214	6	16:11:21	54.768789	4.926304	4.6	
18/08/2012	309_056#01	LB214	7	16:12:37	54.768865	4.926533	4.4	
18/08/2012	309_056#01	LB214	8	16:13:02	54.768822	4.926456	4.5	
18/08/2012	309_057#01	LB215	1	-				Clapper Board
18/08/2012	309_057#01	LB215	2	16:26:33	54.786912	4.932929	6.2	
18/08/2012	309_057#01	LB215	3	16:28:06	54.787114	4.933225	6.3	
18/08/2012	309_057#01	LB215	4	16:29:22	54.787225	4.933410	6.1	
18/08/2012	309_057#01	LB215	5	16:30:06	54.787224	4.933372	6.0	
18/08/2012	309_057#01	LB215	6	16:30:38	54.787179	4.933240	6.2	
18/08/2012	309_057#01	LB215	7	16:31:06	54.787178	4.933099	6.2	
18/08/2012	309_057#01	LB215	8	16:31:32	54.787167	4.932970	6.3	
18/08/2012	309_058#01	LB205	1	-				Clapper Board
18/08/2012	309_058#01	LB205	2	16:45:17	54.791081	4.918323	8.6	
18/08/2012	309_058#01	LB205	3	16:45:42	54.791129	4.918395	8.5	
18/08/2012	309_058#01	LB205	4	16:46:33	54.791140	4.918508	8.8	
18/08/2012	309_058#01	LB205	5	16:49:03	54.791079	4.918441	8.6	
18/08/2012	309_058#01	LB205	6	16:49:44	54.791156	4.918534	8.5	
18/08/2012	309_058#01	LB205	7	16:50:48	54.791275	4.918685	8.4	
18/08/2012	309_059#01	LB206	1	-				Clapper Board
18/08/2012	309_059#01	LB206	2	17:02:13	54.781753	4.916068	8.8	
18/08/2012	309_059#01	LB206	3	17:02:46	54.781819	4.916091	8.8	
18/08/2012	309_059#01	LB206	4	17:03:23	54.781881	4.916136	8.8	
18/08/2012	309_059#01	LB206	5	17:04:09	54.781954	4.916136	8.8	
18/08/2012	309_059#01	LB206	6	17:04:51	54.782030	4.916184	8.7	
18/08/2012	309_059#01	LB206	7	17:05:16	54.782059	4.916274	8.6	
18/08/2012	309_059#01	LB206	8	17:06:00	54.782097	4.916392	8.8	
18/08/2012	309_059#01	LB206	9	17:06:42	54.782111	4.916544	8.7	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
18/08/2012	309_059#01	LB206	10	17:07:04	54.782118	4.916582	8.6	
19/08/2012	309_060#01	LB318	1	-				Clapper Board
19/08/2012	309_060#01	LB318	2	09:06:39	54.688472	4.865964	8.0	
19/08/2012	309_060#01	LB318	3	09:07:38	54.688436	4.866128	7.9	
19/08/2012	309_060#01	LB318	4	09:08:16	54.688415	4.866240	7.8	
19/08/2012	309_060#01	LB318	5	09:09:04	54.688385	4.866297	7.9	
19/08/2012	309_060#01	LB318	6	09:09:32	54.688378	4.866189	7.8	
19/08/2012	309_060#01	LB318	7	09:10:10	54.688407	4.866013	8.0	
19/08/2012	309_060#01	LB318	8	09:10:37	54.688430	4.865919	8.1	
19/08/2012	309_060#01	LB318	9	09:11:01	54.688468	4.865867	7.9	
19/08/2012	309_060#01	LB318	10	09:11:23	54.688491	4.865848	8.1	
19/08/2012	309_061#01	LB307	1	-				Clapper Board
19/08/2012	309_061#01	LB307	2	09:19:22	54.682915	4.857189	8.7	
19/08/2012	309_061#01	LB307	3	09:19:55	54.682922	4.857205	8.7	
19/08/2012	309_061#01	LB307	4	09:20:34	54.682875	4.857369	8.2	
19/08/2012	309_061#01	LB307	5	09:21:00	54.682854	4.857393	8.3	
19/08/2012	309_061#01	LB307	6	09:21:47	54.682803	4.857481	7.9	
19/08/2012	309_061#01	LB307	7	09:22:38	54.682728	4.857547	7.6	
19/08/2012	309_061#01	LB307	8	09:23:19	54.682631	4.857674	7.4	
19/08/2012	309_061#01	LB307	9	09:24:03	54.682568	4.857730	7.2	
19/08/2012	309_061#01	LB307	10	09:24:28	54.682506	4.857812	6.9	
19/08/2012	309_062#01	LB305	1	-				Clapper Board
19/08/2012	309_062#01	LB305	2	09:36:07	54.665525	4.862716	12.6	
19/08/2012	309_062#01	LB305	3	09:36:48	54.665490	4.862906	12.4	
19/08/2012	309_062#01	LB305	4	09:37:23	54.665513	4.862982	12.2	
19/08/2012	309_062#01	LB305	5	09:39:01	54.665365	4.863530	11.6	
19/08/2012	309_062#01	LB305	6	09:40:05	54.665214	4.864009	9.8	
19/08/2012	309_062#01	LB305	7	09:40:51	54.665134	4.864156	9.6	
19/08/2012	309_063#01	LB301	1	-				Clapper Board
19/08/2012	309_063#01	LB301	2	10:03:37	54.638099	4.849464	27.2	
19/08/2012	309_063#01	LB301	3	10:04:28	54.638156	4.849534	27.6	
19/08/2012	309_063#01	LB301	4	10:05:24	54.638154	4.849618	28.0	
19/08/2012	309_063#01	LB301	5	10:05:55	54.638115	4.849685	27.5	
19/08/2012	309_063#01	LB301	6	10:06:15	54.638132	4.849721	27.4	
19/08/2012	309_063#01	LB301	7	10:07:22	54.638190	4.849847	27.2	
19/08/2012	309_063#01	LB301	8	10:07:46	54.638210	4.849886	28.0	
19/08/2012	309_063#01	LB301	9	10:07:59	54.638224	4.849866	28.1	
19/08/2012	309_063#01	LB301	10	10:08:25	54.638240	4.849928	27.9	
19/08/2012	309_064#01	LB302	1	-				Clapper Board
19/08/2012	309_064#01	LB302	2	10:23:58	54.639078	4.846074	31.4	
19/08/2012	309_064#01	LB302	3	10:24:11	54.639068	4.846086	31.2	
19/08/2012	309_064#01	LB302	4	10:24:28	54.639077	4.846047	31.5	
19/08/2012	309_064#01	LB302	5	10:25:36	54.638987	4.846070	31.6	
19/08/2012	309_064#01	LB302	6	10:26:14	54.638931	4.846103	31.3	
19/08/2012	309_064#01	LB302	7	10:26:42	54.638877	4.846086	30.8	
19/08/2012	309_064#01	LB302	8	10:27:21	54.638812	4.846088	31.3	
19/08/2012	309_064#01	LB302	9	10:27:45	54.638768	4.846082	31.3	
19/08/2012	309_064#01	LB302	10	10:29:29	54.638503	4.846198	31.6	
19/08/2012	309_065#01	LB320	1	-				Clapper Board

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
19/08/2012	309_065#01	LB320	2	10:50:18	54.646314	4.840171	27.7	
19/08/2012	309_065#01	LB320	3	10:52:08	54.646162	4.839743	26.8	
19/08/2012	309_065#01	LB320	4	10:52:50	54.646221	4.839856	27.2	
19/08/2012	309_065#01	LB320	5	10:53:46	54.646133	4.839970	27.3	
19/08/2012	309_065#01	LB320	6	10:54:53	54.645871	4.839760	25.6	
19/08/2012	309_065#01	LB320	7	10:55:26	54.645870	4.839792	25.5	No photo taken
19/08/2012	309_066#01	LB425	1	-				Clapper Board
19/08/2012	309_066#01	LB425	2	11:09:04	54.645833	4.821217	29.3	
19/08/2012	309_066#01	LB425	3	11:09:45	54.645788	4.821167	29.7	
19/08/2012	309_066#01	LB425	4	11:10:06	54.645794	4.821197	29.7	
19/08/2012	309_066#01	LB425	5	11:10:47	54.645820	4.821221	29.6	
19/08/2012	309_066#01	LB425	6	11:11:57	54.645803	4.821164	29.7	
19/08/2012	309_066#01	LB425	7	11:12:33	54.645749	4.821097	30.0	
19/08/2012	309_066#01	LB425	8	11:13:21	54.645776	4.821126	30.0	
19/08/2012	309_066#01	LB425	9	11:13:45	54.645710	4.821104	29.8	
19/08/2012	309_066#01	LB425	10	11:14:03	54.645711	4.821087	30.1	
19/08/2012	309_067#01	LB419	1	-				Clapper Board
19/08/2012	309_067#01	LB419	2	11:42:36	54.646881	4.785618	29.3	
19/08/2012	309_067#01	LB419	3	11:42:59	54.646898	4.785527	29.2	
19/08/2012	309_067#01	LB419	4	11:43:33	54.646898	4.785424	29.4	
19/08/2012	309_067#01	LB419	5	11:44:08	54.646874	4.785325	29.3	
19/08/2012	309_067#01	LB419	6	11:44:34	54.646850	4.785231	29.5	
19/08/2012	309_067#01	LB419	7	11:45:12	54.646833	4.785199	29.3	
19/08/2012	309_067#01	LB419	8	11:45:58	54.646878	4.785293	29.4	
19/08/2012	309_067#01	LB419	9	11:46:24	54.646889	4.785170	29.5	
19/08/2012	309_067#01	LB419	10	11:47:12	54.646851	4.785084	29.5	
19/08/2012	309_067#01	LB419	11	11:47:36	54.646845	4.785069	29.4	
19/08/2012	309_068#01	LB418	1	-				Clapper Board
19/08/2012	309_068#01	LB418	2	12:00:50	54.647238	4.758755	28.7	
19/08/2012	309_068#01	LB418	3	12:01:10	54.647252	4.758761	28.2	
19/08/2012	309_068#01	LB418	4	12:01:50	54.647253	4.758706	29.3	
19/08/2012	309_068#01	LB418	5	12:02:16	54.647271	4.758604	29.4	
19/08/2012	309_068#01	LB418	6	12:02:42	54.647324	4.758574	29.3	
19/08/2012	309_068#01	LB418	7	12:03:15	54.647330	4.758486	29.2	
19/08/2012	309_068#01	LB418	8	12:03:43	54.647349	4.758383	29.2	
19/08/2012	309_068#01	LB418	9	12:04:16	54.647350	4.758223	29.2	
19/08/2012	309_068#01	LB418	10	12:05:07	54.647324	4.758187	28.9	
19/08/2012	309_068#01	LB418	11	12:05:32	54.647340	4.758221	29.2	
19/08/2012	309_069#01	LB413	1	-				Clapper Board
19/08/2012	309_069#01	LB413	2	12:20:00	54.646885	4.727600	25.2	
19/08/2012	309_069#01	LB413	3	12:20:21	54.646867	4.727599	25.3	
19/08/2012	309_069#01	LB413	4	12:20:55	54.646780	4.727642	25.4	
19/08/2012	309_069#01	LB413	5	12:21:31	54.646734	4.727706	25.9	
19/08/2012	309_069#01	LB413	6	12:22:03	54.646766	4.727667	25.2	
19/08/2012	309_069#01	LB413	7	12:22:33	54.646741	4.727688	25.1	
19/08/2012	309_069#01	LB413	8	12:23:07	54.646610	4.727790	26.6	
19/08/2012	309_069#01	LB413	9	12:23:28	54.646594	4.727854	25.3	
19/08/2012	309_069#01	LB413	10	12:24:16	54.646623	4.727863	25.5	
19/08/2012	309_069#01	LB413	11	12:24:47	54.646634	4.727830	25.3	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
19/08/2012	309_069#01	LB413	12	12:25:14	54.646611	4.727842	25.3	
19/08/2012	309_070#01	LB107	1	-				Clapper Board
19/08/2012	309_070#01	LB107	2	12:39:23	54.655422	4.733119	26.3	
19/08/2012	309_070#01	LB107	3	12:39:41	54.655407	4.733139	26.4	
19/08/2012	309_070#01	LB107	4	12:40:34	54.655425	4.733126	26.3	
19/08/2012	309_070#01	LB107	5	12:41:16	54.655265	4.733212	26.5	
19/08/2012	309_070#01	LB107	6	12:42:15	54.655229	4.733534	26.4	
19/08/2012	309_070#01	LB107	7	12:42:34	54.655292	4.733646	26.5	
19/08/2012	309_070#01	LB107	8	12:43:15	54.655304	4.733707	26.3	
19/08/2012	309_070#01	LB107	9	12:43:53	54.655267	4.733794	26.4	
19/08/2012	309_070#01	LB107	10	12:44:26	54.655247	4.733927	26.3	
19/08/2012	309_070#01	LB107	11	12:44:50	54.655231	4.734036	25.9	
19/08/2012	309_071#01	LB106	1	-				Clapper Board
19/08/2012	309_071#01	LB106	2	12:59:18	54.663467	4.741866	25.4	
19/08/2012	309_071#01	LB106	3	13:00:04	54.663583	4.742141	25.4	
19/08/2012	309_071#01	LB106	4	13:00:42	54.663669	4.742287	25.3	
19/08/2012	309_071#01	LB106	5	13:01:46	54.663692	4.742611	25.3	
19/08/2012	309_071#01	LB106	6	13:02:46	54.663701	4.742999	25.3	
19/08/2012	309_071#01	LB106	7	13:03:27	54.663673	4.743179	25.3	
19/08/2012	309_071#01	LB106	8	13:03:53	54.663677	4.743314	25.3	
19/08/2012	309_071#01	LB106	9	13:04:13	54.663728	4.743415	25.3	
19/08/2012	309_072#01	LB103	1	-				Clapper Board
19/08/2012	309_072#01	LB103	2	13:30:16	54.684139	4.755073	24.3	Line abandoned; too much tide
19/08/2012	309_073#01	LB417	1	-				Clapper Board
19/08/2012	309_073#01	LB417	2	13:49:10	54.703710	4.780071	22.2	
19/08/2012	309_073#01	LB417	3	13:49:43	54.703649	4.780116	22.6	
19/08/2012	309_073#01	LB417	4	13:50:00	54.703634	4.780176	22.7	
19/08/2012	309_073#01	LB417	5	13:50:28	54.703616	4.780262	22.8	
19/08/2012	309_073#01	LB417	6	13:50:56	54.703586	4.780381	22.9	
19/08/2012	309_073#01	LB417	7	13:52:23	54.703546	4.780919	22.7	
19/08/2012	309_073#01	LB417	8	13:53:11	54.703433	4.781042	22.7	
19/08/2012	309_073#01	LB417	9	13:53:34	54.703396	4.781104	22.6	
19/08/2012	309_073#01	LB417	10	13:53:58	54.703337	4.781153	22.5	
19/08/2012	309_074#01	LB022	1	-				Clapper Board
19/08/2012	309_074#01	LB022	2	14:16:58	54.710108	4.836172	21.0	
19/08/2012	309_074#01	LB022	3	14:17:55	54.709947	4.835796	21.3	
19/08/2012	309_074#01	LB022	4	14:18:24	54.709883	4.835707	21.1	
19/08/2012	309_074#01	LB022	5	14:18:53	54.709851	4.835582	21.5	
19/08/2012	309_074#01	LB022	6	14:19:35	54.709748	4.835371	21.3	
19/08/2012	309_074#01	LB022	7	14:19:55	54.709666	4.835244	21.4	
19/08/2012	309_074#01	LB022	8	14:20:37	54.709583	4.835236	21.2	
19/08/2012	309_074#01	LB022	9	14:21:00	54.709544	4.835342	21.3	
19/08/2012	309_075#01	LB002	1	-				Clapper Board; Line abnadoned due to tide
19/08/2012	309_076#01	LB314	1	-				Clapper Board
19/08/2012	309_076#01	LB314	2	15:00:50	54.709972	4.880269	12.5	
19/08/2012	309_076#01	LB314	3	15:01:49	54.709803	4.880541	11.4	
19/08/2012	309_076#01	LB314	4	15:02:39	54.709711	4.880721	10.9	
19/08/2012	309_076#01	LB314	5	15:03:00	54.709720	4.880815	10.8	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
19/08/2012	309_076#01	LB314	6	15:03:25	54.709746	4.880964	10.7	
19/08/2012	309_076#01	LB314	7	15:04:26	54.709665	4.881137	10.5	
19/08/2012	309_076#01	LB314	8	15:04:58	54.709588	4.881241	10.2	
19/08/2012	309_076#01	LB314	9	15:05:43	54.709419	4.881345	10.1	
19/08/2012	309_077#01	LB312	1	-				Clapper Board
19/08/2012	309_077#01	LB312	2	15:14:50	54.701194	4.883245	7.3	
19/08/2012	309_077#01	LB312	3	15:15:38	54.701136	4.883154	6.8	
19/08/2012	309_077#01	LB312	4	15:16:09	54.701100	4.883053	7.5	
19/08/2012	309_077#01	LB312	5	15:16:33	54.701104	4.882937	7.2	
19/08/2012	309_077#01	LB312	6	15:17:11	54.701095	4.882797	6.3	
19/08/2012	309_077#01	LB312	7	15:17:44	54.701152	4.882751	7.5	
19/08/2012	309_077#01	LB312	8	15:18:29	54.701190	4.882641	6.9	
19/08/2012	309_077#01	LB312	9	15:18:59	54.701174	4.882492	6.7	
19/08/2012	309_077#01	LB312	10	15:19:25	54.701208	4.882385	7.6	
19/08/2012	309_077#01	LB312	11	15:19:48	54.701252	4.882365	7.7	
19/08/2012	309_078#01	LB311	1	-				Clapper Board
19/08/2012	309_078#01	LB311	2	15:26:00	54.697730	4.879620	7.5	
19/08/2012	309_078#01	LB311	3	15:26:29	54.697739	4.879476	8.7	
19/08/2012	309_078#01	LB311	4	15:27:06	54.697687	4.879408	8.8	
19/08/2012	309_078#01	LB311	5	15:27:37	54.697664	4.879279	7.7	
19/08/2012	309_078#01	LB311	6	15:28:00	54.697611	4.879266	8.4	
19/08/2012	309_078#01	LB311	7	15:28:29	54.697622	4.879143	8.5	
19/08/2012	309_078#01	LB311	8	15:29:00	54.697580	4.879087	8.4	
19/08/2012	309_078#01	LB311	9	15:29:32	54.697577	4.878950	8.5	
19/08/2012	309_078#01	LB311	10	15:30:02	54.697528	4.878869	8.5	
19/08/2012	309_078#01	LB311	11	15:30:19	54.697515	4.878842	8.4	
19/08/2012	309_078#01	LB311	12	15:30:47	54.697487	4.878759	8.5	
19/08/2012	309_079#01	LB310	1	-				Clapper Board
19/08/2012	309_079#01	LB310	2	15:40:11	54.697070	4.868473	8.2	
19/08/2012	309_079#01	LB310	3	15:40:51	54.697007	4.868538	8.4	
19/08/2012	309_079#01	LB310	4	15:42:10	54.696670	4.868766	8.0	
19/08/2012	309_079#01	LB310	5	15:42:48	54.696626	4.868776	8.1	
19/08/2012	309_079#01	LB310	6	15:43:23	54.696576	4.868772	8.1	
19/08/2012	309_079#01	LB310	7	15:43:54	54.696527	4.868762	8.1	
19/08/2012	309_079#01	LB310	8	15:44:22	54.696468	4.868759	8.2	
19/08/2012	309_080#01	LB309	1	-				Clapper Board
19/08/2012	309_080#01	LB309	2	15:59:24	54.695100	4.851375	11.5	
19/08/2012	309_080#01	LB309	3	15:59:53	54.695007	4.851368	12.9	
19/08/2012	309_080#01	LB309	4	16:00:26	54.694939	4.851300	12.7	
19/08/2012	309_080#01	LB309	5	16:01:58	54.694691	4.851379	12.5	
19/08/2012	309_080#01	LB309	6	16:02:28	54.694639	4.851370	12.5	
19/08/2012	309_080#01	LB309	7	16:03:11	54.694534	4.851335	12.5	
19/08/2012	309_080#01	LB309	8	16:03:29	54.694521	4.851303	12.6	
19/08/2012	309_080#01	LB309	9	16:03:50	54.694458	4.851255	12.6	
19/08/2012	309_081#01	LB306	1	-				Clapper Board
19/08/2012	309_081#01	LB306	2	16:16:41	54.683485	4.842943	13.1	
19/08/2012	309_081#01	LB306	3	16:17:28	54.683327	4.843022	12.7	
19/08/2012	309_081#01	LB306	4	16:18:55	54.683125	4.843036	13.0	
19/08/2012	309_081#01	LB306	5	16:20:03	54.682712	4.842929	13.6	Line abandoned; currents too strong

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
20/08/2012	309_082#01	LB317	1	-				Clapper Board
20/08/2012	309_082#01	LB317	2	09:20:06	54.719580	4.887570	9.9	
20/08/2012	309_082#01	LB317	3	09:21:25	54.719760	4.887264	10.7	
20/08/2012	309_082#01	LB317	4	09:22:40	54.719866	4.886872	10.7	
20/08/2012	309_082#01	LB317	5	09:23:07	54.719913	4.886837	10.7	
20/08/2012	309_082#01	LB317	6	09:23:30	54.719960	4.886812	10.7	
20/08/2012	309_082#01	LB317	7	09:23:53	54.719992	4.886782	10.7	
20/08/2012	309_082#01	LB317	8	09:24:12	54.720039	4.886744	10.8	
20/08/2012	309_083#01	LB201	1	-				Clapper Board
20/08/2012	309_083#01	LB201	2	09:58:42	54.731092	4.892164	11.5	
20/08/2012	309_083#01	LB201	3	09:59:17	54.731072	4.892110	11.7	
20/08/2012	309_083#01	LB201	4	09:59:36	54.731028	4.892123	11.7	
20/08/2012	309_083#01	LB201	5	09:59:54	54.731048	4.892117	11.7	
20/08/2012	309_083#01	LB201	6	10:00:54	54.731177	4.891995	12.1	
20/08/2012	309_083#01	LB201	7	10:01:40	54.731251	4.891947	11.7	
20/08/2012	309_083#01	LB201	8	10:02:05	54.731246	4.891864	11.9	
20/08/2012	309_083#01	LB201	9	10:02:44	54.731259	4.891695	11.9	
20/08/2012	309_083#01	LB201	10	10:03:15	54.731245	4.891691	11.8	
20/08/2012	309_083#01	LB201	11	10:03:38	54.731271	4.891656	11.8	
20/08/2012	309_084#01	LB208	1	-				Clapper Board
20/08/2012	309_084#01	LB208	2	10:14:52	54.743860	4.877509	13.3	
20/08/2012	309_084#01	LB208	3	10:15:44	54.743900	4.877343	13.4	
20/08/2012	309_084#01	LB208	4	10:16:17	54.743878	4.877312	13.4	
20/08/2012	309_084#01	LB208	5	10:17:14	54.743966	4.877199	13.4	
20/08/2012	309_084#01	LB208	6	10:17:34	54.743965	4.877158	13.4	
20/08/2012	309_084#01	LB208	7	10:18:11	54.743996	4.877106	13.5	
20/08/2012	309_084#01	LB208	8	10:19:11	54.744087	4.876935	13.4	
20/08/2012	309_084#01	LB208	9	10:19:32	54.744090	4.876929	13.6	
20/08/2012	309_085#01	LB207	1	-				Clapper Board
20/08/2012	309_085#01	LB207	2	10:30:32	54.743567	4.894297	13.4	
20/08/2012	309_085#01	LB207	3	10:30:54	54.743601	4.894227	13.0	
20/08/2012	309_085#01	LB207	4	10:31:34	54.743630	4.894107	12.9	
20/08/2012	309_085#01	LB207	5	10:31:57	54.743651	4.894047	13.0	
20/08/2012	309_085#01	LB207	6	10:32:37	54.743669	4.893960	13.1	
20/08/2012	309_085#01	LB207	7	10:33:44	54.743738	4.893817	13.2	
20/08/2012	309_085#01	LB207	8	10:34:12	54.743781	4.893761	13.2	
20/08/2012	309_085#01	LB207	9	10:34:40	54.743769	4.893649	13.3	
20/08/2012	309_085#01	LB207	10	10:35:06	54.743806	4.893564	13.4	
20/08/2012	309_086#01	LB212	1	-				Clapper Board
20/08/2012	309_086#01	LB212	2	10:42:18	54.747646	4.903071	11.7	
20/08/2012	309_086#01	LB212	3	10:42:46	54.747686	4.903001	11.7	
20/08/2012	309_086#01	LB212	4	10:43:10	54.747668	4.902861	11.7	
20/08/2012	309_086#01	LB212	5	10:44:03	54.747702	4.902801	11.7	
20/08/2012	309_086#01	LB212	6	10:45:12	54.747793	4.902599	12.0	
20/08/2012	309_086#01	LB212	7	10:45:36	54.747824	4.902543	12.5	
20/08/2012	309_086#01	LB212	8	10:47:14	54.747965	4.902216	12.5	
20/08/2012	309_087#01	LB203	1	-				Clapper Board
20/08/2012	309_087#01	LB203	2	11:04:55	54.764942	4.909608	12.7	
20/08/2012	309_087#01	LB203	3	11:05:22	54.764933	4.909561	12.1	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
20/08/2012	309_087#01	LB203	4	11:05:52	54.764955	4.909490	12.0	
20/08/2012	309_087#01	LB203	5	11:06:20	54.764959	4.909431	12.1	
20/08/2012	309_087#01	LB203	6	11:06:46	54.764963	4.909341	12.1	
20/08/2012	309_087#01	LB203	7	11:07:18	54.764920	4.909207	12.1	
20/08/2012	309_087#01	LB203	8	11:07:43	54.764909	4.909174	12.1	
20/08/2012	309_087#01	LB203	9	11:08:05	54.764910	4.909147	12.2	
20/08/2012	309_087#01	LB203	10	11:08:53	54.765019	4.909026	12.2	
20/08/2012	309_087#01	LB203	11	11:09:37	54.765087	4.908949	12.3	
24/08/2012	309_088#01	LB417	1	-				Clapper Board
24/08/2012	309_088#01	LB417	2	09:27:46	54.703860	4.780742	18.6	
24/08/2012	309_088#01	LB417	3	09:28:22	54.703906	4.780734	18.5	
24/08/2012	309_088#01	LB417	4	09:28:42	54.703933	4.780699	18.5	
24/08/2012	309_088#01	LB417	5	09:29:20	54.703952	4.780642	18.4	
24/08/2012	309_088#01	LB417	6	09:30:09	54.703924	4.780603	18.1	
24/08/2012	309_088#01	LB417	7	09:30:49	54.703880	4.780524	17.8	
24/08/2012	309_088#01	LB417	8	09:32:10	54.703826	4.780393	18.5	
24/08/2012	309_088#01	LB417	9	09:32:26	54.703811	4.780373	18.5	
24/08/2012	309_089#01	LB109	1	-				Clapper Board
24/08/2012	309_089#01	LB109	2	09:52:52	54.691640	4.746757	17.5	
24/08/2012	309_089#01	LB109	3	09:53:12	54.691668	4.746788	17.3	
24/08/2012	309_089#01	LB109	4	09:53:37	54.691717	4.746818	17.1	
24/08/2012	309_089#01	LB109	5	09:54:14	54.691772	4.746939	17.3	
24/08/2012	309_089#01	LB109	6	09:54:42	54.691749	4.747018	17.2	
24/08/2012	309_089#01	LB109	7	09:55:10	54.691742	4.746967	17.1	
24/08/2012	309_089#01	LB109	8	09:55:43	54.691755	4.746962	17.1	
24/08/2012	309_089#01	LB109	9	09:56:28	54.691754	4.746981	17.2	
24/08/2012	309_089#01	LB109	10	09:57:29	54.691804	4.746962	17.2	
24/08/2012	309_089#01	LB109	11	09:57:57	54.691850	4.746988	17.2	
24/08/2012	309_089#01	LB109	12	09:58:33	54.691858	4.747104	17.2	
24/08/2012	309_089#01	LB109	13	09:59:30	54.691868	4.747235	17.1	
24/08/2012	309_089#01	LB109	14	10:00:09	54.691866	4.747286	17.2	
24/08/2012	309_089#01	LB109	15	10:00:53	54.691837	4.747315	17.2	
24/08/2012	309_089#01	LB109	16	10:01:26	54.691843	4.747466	16.9	
24/08/2012	309_089#01	LB109	17	10:01:54	54.691884	4.747535	16.9	
24/08/2012	309_089#01	LB109	18	10:02:24	54.691887	4.747617	16.8	
24/08/2012	309_089#01	LB109	19	10:02:54	54.691893	4.747785	16.8	
24/08/2012	309_090#01	LB111	1	-				Clapper Board
24/08/2012	309_090#01	LB111	2	10:12:16	54.692016	4.745127	17.3	
24/08/2012	309_090#01	LB111	3	10:12:47	54.691992	4.745135	17.3	
24/08/2012	309_090#01	LB111	4	10:13:18	54.691989	4.745215	17.3	
24/08/2012	309_090#01	LB111	5	10:13:45	54.691978	4.745293	17.2	
24/08/2012	309_090#01	LB111	6	10:14:05	54.691957	4.745350	17.2	
24/08/2012	309_090#01	LB111	7	10:14:42	54.691958	4.745399	17.5	
24/08/2012	309_090#01	LB111	8	10:15:03	54.691954	4.745428	17.4	
24/08/2012	309_090#01	LB111	9	10:15:48	54.691921	4.745456	17.2	
24/08/2012	309_090#01	LB111	10	10:16:54	54.691860	4.745533	17.3	
24/08/2012	309_090#01	LB111	11	10:17:37	54.691845	4.745530	17.5	
24/08/2012	309_090#01	LB111	12	10:18:20	54.691818	4.745594	17.5	
24/08/2012	309_090#01	LB111	13	10:19:00	54.691813	4.745643	17.5	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
24/08/2012	309_090#01	LB111	14	10:19:42	54.691739	4.745730	17.2	
24/08/2012	309_090#01	LB111	15	10:20:34	54.691729	4.745873	17.5	
24/08/2012	309_090#01	LB111	16	10:21:04	54.691740	4.745910	17.2	
24/08/2012	309_090#01	LB111	17	10:21:33	54.691699	4.745911	17.3	
24/08/2012	309_090#01	LB111	18	10:22:01	54.691706	4.745974	17.3	
24/08/2012	309_091#01	LB112	1	-				Clapper Board
24/08/2012	309_091#01	LB112	2	10:27:37	54.691788	4.748138	16.7	
24/08/2012	309_091#01	LB112	3	10:28:12	54.691770	4.748210	16.7	
24/08/2012	309_091#01	LB112	4	10:28:42	54.691755	4.748287	16.7	
24/08/2012	309_091#01	LB112	5	10:29:05	54.691751	4.748334	16.7	
24/08/2012	309_091#01	LB112	6	10:29:38	54.691746	4.748398	16.5	
24/08/2012	309_091#01	LB112	7	10:30:22	54.691737	4.748545	16.7	
24/08/2012	309_091#01	LB112	8	10:30:42	54.691742	4.748594	16.4	
24/08/2012	309_091#01	LB112	9	10:30:58	54.691743	4.748610	16.4	
24/08/2012	309_091#01	LB112	10	10:31:25	54.691746	4.748606	16.4	
24/08/2012	309_091#01	LB112	11	10:32:07	54.691743	4.748616	16.4	
24/08/2012	309_091#01	LB112	12	10:33:14	54.691775	4.748732	16.4	
24/08/2012	309_091#01	LB112	13	10:33:35	54.691748	4.748757	16.2	
24/08/2012	309_091#01	LB112	14	10:34:10	54.691745	4.748813	16.3	
24/08/2012	309_091#01	LB112	15	10:34:51	54.691732	4.748905	16.1	
24/08/2012	309_091#01	LB112	16	10:35:28	54.691787	4.748951	16.1	
24/08/2012	309_091#01	LB112	17	10:36:17	54.691752	4.748961	16.3	
24/08/2012	309_091#01	LB112	18	10:36:43	54.691747	4.748984	16.1	
24/08/2012	309_091#01	LB112	19	10:37:23	54.691802	4.749076	16.1	
24/08/2012	309_092#01	LB114	1	-				Clapper Board
24/08/2012	309_092#01	LB114	2	11:08:04	54.691643	4.751360	16.0	
24/08/2012	309_092#01	LB114	3	11:08:47	54.691642	4.751362	16.0	
24/08/2012	309_092#01	LB114	4	11:09:31	54.691680	4.751232	15.7	
24/08/2012	309_092#01	LB114	5	11:10:07	54.691694	4.751253	16.0	
24/08/2012	309_092#01	LB114	6	11:10:32	54.691710	4.751216	16.0	
24/08/2012	309_092#01	LB114	7	11:11:23	54.691750	4.751045	16.0	
24/08/2012	309_092#01	LB114	8	11:11:43	54.691763	4.751001	16.0	
24/08/2012	309_092#01	LB114	9	11:11:56	54.691784	4.750961	15.1	
24/08/2012	309_092#01	LB114	10	11:12:26	54.691789	4.750924	16.0	
24/08/2012	309_092#01	LB114	11	11:12:45	54.691807	4.750909	16.0	
24/08/2012	309_092#01	LB114	12	11:12:58	54.691805	4.750889	16.0	
24/08/2012	309_093#01	LB113	1	-				Clapper Board
24/08/2012	309_093#01	LB113	2	11:21:06	54.692068	4.741513	18.2	
24/08/2012	309_093#01	LB113	3	11:21:30	54.692074	4.741424	18.4	
24/08/2012	309_093#01	LB113	4	11:22:01	54.692069	4.741314	18.4	
24/08/2012	309_093#01	LB113	5	11:22:34	54.692056	4.741270	18.4	
24/08/2012	309_093#01	LB113	6	11:23:22	54.692053	4.741313	18.4	
24/08/2012	309_093#01	LB113	7	11:24:16	54.692071	4.741248	18.4	
24/08/2012	309_093#01	LB113	8	11:24:51	54.692066	4.741249	18.4	
24/08/2012	309_093#01	LB113	9	11:25:32	54.692048	4.741239	18.5	
24/08/2012	309_093#01	LB113	10	11:26:04	54.692025	4.741253	18.4	
24/08/2012	309_094#01	LB104	1	-				Clapper Board
24/08/2012	309_094#01	LB104	2	11:40:38	54.689543	4.715843	20.2	
24/08/2012	309_094#01	LB104	3	11:41:03	54.689566	4.715763	20.2	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
24/08/2012	309_094#01	LB104	4	11:41:31	54.689608	4.715674	20.3	
24/08/2012	309_094#01	LB104	5	11:42:03	54.689624	4.715592	20.2	
24/08/2012	309_094#01	LB104	6	11:42:21	54.689648	4.715542	20.5	
24/08/2012	309_094#01	LB104	7	11:42:49	54.689702	4.715457	20.3	
24/08/2012	309_094#01	LB104	8	11:43:19	54.689740	4.715381	20.3	
24/08/2012	309_094#01	LB104	9	11:44:04	54.689843	4.715291	20.3	
24/08/2012	309_094#01	LB104	10	11:44:37	54.689894	4.715213	20.5	
24/08/2012	309_094#01	LB104	11	11:45:06	54.689942	4.715134	20.2	
24/08/2012	309_095#01	LB409	1	-				Clapper Board
24/08/2012	309_095#01	LB409	2	11:55:10	54.691009	4.698344	20.1	
24/08/2012	309_095#01	LB409	3	11:55:29	54.690978	4.698261	20.0	
24/08/2012	309_095#01	LB409	4	11:57:07	54.691228	4.697425	20.2	Line abandoned - tide too strong
24/08/2012	309_096#01	LB007	1	-				Clapper Board
24/08/2012	309_096#01	LB007	2	12:33:29	54.780281	4.750958	14.1	
24/08/2012	309_096#01	LB007	3	12:34:06	54.780240	4.750904	14.2	
24/08/2012	309_096#01	LB007	4	12:34:39	54.780208	4.750795	14.2	
24/08/2012	309_096#01	LB007	5	12:35:14	54.780160	4.750783	14.0	
24/08/2012	309_096#01	LB007	6	12:35:58	54.780098	4.750859	14.2	
24/08/2012	309_096#01	LB007	7	12:36:29	54.780037	4.750916	14.2	
24/08/2012	309_096#01	LB007	8	12:37:00	54.779994	4.750999	14.3	
24/08/2012	309_096#01	LB007	9	12:37:33	54.779992	4.751080	14.3	
24/08/2012	309_096#01	LB007	10	12:37:59	54.779956	4.751161	14.2	
24/08/2012	309_096#01	LB007	11	12:38:24	54.779935	4.751237	14.2	
24/08/2012	309_097#01	LB008	1	-				Clapper Board
24/08/2012	309_097#01	LB008	2	12:55:03	54.780696	4.756161	14.7	
24/08/2012	309_097#01	LB008	3	12:55:48	54.780773	4.756249	14.7	
24/08/2012	309_097#01	LB008	4	12:56:36	54.780983	4.756165	14.7	
24/08/2012	309_097#01	LB008	5	12:57:18	54.781112	4.756085	14.7	
24/08/2012	309_097#01	LB008	6	12:57:53	54.781171	4.756055	14.7	
24/08/2012	309_097#01	LB008	7	12:58:20	54.781218	4.756025	14.7	
24/08/2012	309_097#01	LB008	8	12:58:52	54.781265	4.756002	14.7	
24/08/2012	309_097#01	LB008	9	12:59:22	54.781267	4.755901	14.6	
24/08/2012	309_097#01	LB008	10	12:59:40	54.781306	4.755916	14.8	
24/08/2012	309_098#01	LB009	1	-				Clapper Board
24/08/2012	309_098#01	LB009	2	13:08:49	54.781834	4.761563	15.1	
24/08/2012	309_098#01	LB009	3	13:09:31	54.781834	4.761577	15.1	
24/08/2012	309_098#01	LB009	4	13:10:03	54.781802	4.761586	14.3	
24/08/2012	309_098#01	LB009	5	13:10:39	54.781749	4.761635	14.3	
24/08/2012	309_098#01	LB009	6	13:11:15	54.781721	4.761673	14.3	
24/08/2012	309_098#01	LB009	7	13:11:45	54.781695	4.761690	14.2	
24/08/2012	309_098#01	LB009	8	13:12:18	54.781680	4.761739	15.1	
24/08/2012	309_098#01	LB009	9	13:12:45	54.781672	4.761798	14.9	
24/08/2012	309_098#01	LB009	10	13:13:08	54.781670	4.761822	15.1	
24/08/2012	309_099#01	LB014	1	-				Clapper Board
24/08/2012	309_099#01	LB014	2	13:30:03	54.804110	4.796730	15.2	
24/08/2012	309_099#01	LB014	3	13:30:45	54.804190	4.796643	15.3	
24/08/2012	309_099#01	LB014	4	13:31:07	54.804157	4.796528	15.3	
24/08/2012	309_099#01	LB014	5	13:31:29	54.804146	4.796525	15.2	
24/08/2012	309_099#01	LB014	6	13:32:02	54.804083	4.796534	15.3	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
24/08/2012	309_099#01	LB014	7	13:32:28	54.804058	4.796500	14.6	
24/08/2012	309_099#01	LB014	8	13:32:59	54.804003	4.796523	15.2	
24/08/2012	309_099#01	LB014	9	13:33:32	54.803970	4.796501	15.3	
24/08/2012	309_099#01	LB014	10	13:33:56	54.803944	4.796442	15.3	
24/08/2012	309_099#01	LB014	11	13:34:24	54.803893	4.796437	14.6	
24/08/2012	309_099#01	LB014	12	13:34:48	54.803846	4.796427	14.6	
24/08/2012	309_100#01	LB013	1	-				Clapper Board
24/08/2012	309_100#01	LB013	2	13:45:20	54.816047	4.807058	14.3	
24/08/2012	309_100#01	LB013	3	13:45:54	54.815990	4.807008	14.3	
24/08/2012	309_100#01	LB013	4	13:46:28	54.815952	4.807021	14.3	
24/08/2012	309_100#01	LB013	5	13:47:05	54.815921	4.806968	14.0	
24/08/2012	309_100#01	LB013	6	13:47:45	54.815880	4.806924	14.5	
24/08/2012	309_100#01	LB013	7	13:48:16	54.815846	4.806894	14.2	
24/08/2012	309_100#01	LB013	8	13:48:58	54.815832	4.806859	14.4	
24/08/2012	309_100#01	LB013	9	13:49:24	54.815853	4.806799	14.7	
24/08/2012	309_100#01	LB013	10	13:49:42	54.815831	4.806816	14.3	
24/08/2012	309_101#01	LB015	1	-				Clapper Board
24/08/2012	309_101#01	LB015	2	13:58:35	54.813942	4.824009	14.4	
24/08/2012	309_101#01	LB015	3	13:59:17	54.813964	4.823947	14.7	
24/08/2012	309_101#01	LB015	4	14:00:02	54.813934	4.823859	14.5	
24/08/2012	309_101#01	LB015	5	14:00:37	54.813930	4.823885	14.6	
24/08/2012	309_101#01	LB015	6	14:01:36	54.813841	4.823790	14.4	
24/08/2012	309_101#01	LB015	7	14:02:06	54.813844	4.823767	14.6	
24/08/2012	309_101#01	LB015	8	14:02:53	54.813867	4.823728	14.6	
24/08/2012	309_102#01	LB020	1	-				Clapper Board
24/08/2012	309_102#01	LB020	2	14:18:13	54.846137	4.819265	7.1	
24/08/2012	309_102#01	LB020	3	14:18:36	54.846114	4.819257	7.1	
24/08/2012	309_102#01	LB020	4	14:19:08	54.846063	4.819153	7.1	
24/08/2012	309_102#01	LB020	5	14:19:34	54.846016	4.819112	6.3	
24/08/2012	309_102#01	LB020	6	14:20:08	54.845959	4.819135	7.1	
24/08/2012	309_102#01	LB020	7	14:20:28	54.845954	4.819094	7.1	
24/08/2012	309_102#01	LB020	8	14:21:05	54.845963	4.819051	7.2	
24/08/2012	309_102#01	LB020	9	14:21:29	54.845939	4.819045	7.2	
24/08/2012	309_102#01	LB020	10	14:21:58	54.845962	4.818973	7.2	
24/08/2012	309_102#01	LB020	11	14:22:18	54.845980	4.818936	7.2	
24/08/2012	309_103#01	LB019	1	-				Clapper Board
24/08/2012	309_103#01	LB019	2	14:33:22	54.846169	4.848410	5.3	
24/08/2012	309_103#01	LB019	3	14:33:56	54.846216	4.848415	5.3	
24/08/2012	309_103#01	LB019	4	14:34:45	54.846290	4.848298	5.5	
24/08/2012	309_103#01	LB019	5	14:35:20	54.846257	4.848249	5.5	
24/08/2012	309_103#01	LB019	6	14:36:00	54.846271	4.848174	5.4	
24/08/2012	309_103#01	LB019	7	14:36:29	54.846278	4.848111	5.5	
24/08/2012	309_103#01	LB019	8	14:36:57	54.846261	4.848043	5.5	
24/08/2012	309_103#01	LB019	9	14:37:29	54.846218	4.847966	5.5	
24/08/2012	309_103#01	LB019	10	14:37:55	54.846197	4.847951	5.5	
24/08/2012	309_104#01	LB021	1	-				Clapper Board
24/08/2012	309_104#01	LB021	2	14:48:09	54.836798	4.854058	11.7	
24/08/2012	309_104#01	LB021	3	14:48:30	54.836785	4.854042	11.2	
24/08/2012	309_104#01	LB021	4	14:49:01	54.836784	4.853937	11.7	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
24/08/2012	309_104#01	LB021	5	14:49:33	54.836723	4.853933	10.9	
24/08/2012	309_104#01	LB021	6	14:50:05	54.836703	4.853957	11.8	
24/08/2012	309_104#01	LB021	7	14:50:41	54.836644	4.853886	11.8	
24/08/2012	309_104#01	LB021	8	14:51:25	54.836544	4.853929	11.0	
24/08/2012	309_104#01	LB021	9	14:51:57	54.836546	4.853907	11.8	
24/08/2012	309_104#01	LB021	10	14:52:20	54.836560	4.853916	11.9	
24/08/2012	309_104#01	LB021	11	14:52:35	54.836585	4.853842	11.9	
24/08/2012	309_105#01	LB018	1	-				Clapper Board
24/08/2012	309_105#01	LB018	2	15:01:04	54.838964	4.879485	6.1	
24/08/2012	309_105#01	LB018	3	15:01:35	54.838960	4.879451	6.1	
24/08/2012	309_105#01	LB018	4	15:02:05	54.838967	4.879433	6.1	
24/08/2012	309_105#01	LB018	5	15:02:48	54.838937	4.879310	6.3	
24/08/2012	309_105#01	LB018	6	15:03:11	54.838925	4.879296	6.1	
24/08/2012	309_105#01	LB018	7	15:03:49	54.838871	4.879284	6.3	
24/08/2012	309_105#01	LB018	8	15:04:20	54.838878	4.879262	6.3	
24/08/2012	309_105#01	LB018	9	15:04:39	54.838884	4.879223	6.3	
24/08/2012	309_105#01	LB018	10	15:05:16	54.838875	4.879100	6.4	
24/08/2012	309_105#01	LB018	11	15:05:40	54.838861	4.879029	6.3	
24/08/2012	309_106#01	LB017	1	-				Clapper Board
24/08/2012	309_106#01	LB017	2	15:16:56	54.825804	4.911163	6.5	
24/08/2012	309_106#01	LB017	3	15:17:28	54.825810	4.911130	6.5	
24/08/2012	309_106#01	LB017	4	15:18:06	54.825794	4.911038	6.7	
24/08/2012	309_106#01	LB017	5	15:19:06	54.825811	4.910931	6.5	
24/08/2012	309_106#01	LB017	6	15:19:28	54.825817	4.910875	6.7	
24/08/2012	309_106#01	LB017	7	15:19:58	54.825829	4.910810	6.7	
24/08/2012	309_106#01	LB017	8	15:21:00	54.825882	4.910732	6.7	
24/08/2012	309_106#01	LB017	9	15:21:28	54.825908	4.910784	6.7	
24/08/2012	309_107#01	LB016	1	-				Clapper Board
24/08/2012	309_107#01	LB016	2	15:34:08	54.810126	4.932424	8.4	
24/08/2012	309_107#01	LB016	3	15:34:45	54.810188	4.932351	8.4	
24/08/2012	309_107#01	LB016	4	15:35:14	54.810235	4.932279	8.3	
24/08/2012	309_107#01	LB016	5	15:35:59	54.810267	4.932139	8.4	
24/08/2012	309_107#01	LB016	6	15:36:41	54.810249	4.932096	8.1	
24/08/2012	309_107#01	LB016	7	15:37:17	54.810223	4.932028	8.4	
24/08/2012	309_107#01	LB016	8	15:37:45	54.810223	4.931984	8.5	
24/08/2012	309_107#01	LB016	9	15:38:24	54.810209	4.931888	8.4	
24/08/2012	309_107#01	LB016	10	15:38:49	54.810202	4.931850	8.5	
24/08/2012	309_108#01	LB202	1	-				Clapper Board
24/08/2012	309_108#01	LB202	2	16:06:41	54.768429	4.894073	14.8	
24/08/2012	309_108#01	LB202	3	16:07:26	54.768385	4.894128	14.7	
24/08/2012	309_108#01	LB202	4	16:08:22	54.768313	4.894132	14.7	
24/08/2012	309_108#01	LB202	5	16:08:58	54.768291	4.894095	14.2	
24/08/2012	309_108#01	LB202	6	16:09:37	54.768262	4.894035	14.8	
24/08/2012	309_108#01	LB202	7	16:10:07	54.768217	4.894005	14.8	
24/08/2012	309_108#01	LB202	8	16:10:45	54.768172	4.893983	14.7	
24/08/2012	309_108#01	LB202	9	16:11:19	54.768135	4.893979	14.7	
24/08/2012	309_109#01	LB204	1	-				Clapper Board
24/08/2012	309_109#01	LB204	2	16:22:07	54.767207	4.915606	11.9	
24/08/2012	309_109#01	LB204	3	16:22:40	54.767227	4.915641	12.1	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
24/08/2012	309_109#01	LB204	4	16:23:09	54.767259	4.915636	11.9	
24/08/2012	309_109#01	LB204	5	16:23:42	54.767307	4.915561	12.1	
24/08/2012	309_109#01	LB204	6	16:24:25	54.767340	4.915478	12.2	
24/08/2012	309_109#01	LB204	7	16:25:02	54.767344	4.915460	12.1	
24/08/2012	309_109#01	LB204	8	16:25:32	54.767346	4.915414	11.9	
24/08/2012	309_109#01	LB204	9	16:26:00	54.767342	4.915385	12.1	
24/08/2012	309_109#01	LB204	10	16:26:33	54.767338	4.915287	12.0	
24/08/2012	309_109#01	LB204	11	16:26:59	54.767333	4.915255	12.1	
25/08/2012	309_110#01	LB101	1	-				Clapper Board
25/08/2012	309_110#01	LB101	2	10:49:04	54.685833	4.758055	24.3	
25/08/2012	309_110#01	LB101	3	10:49:44	54.685770	4.758127	24.4	
25/08/2012	309_110#01	LB101	4	10:50:06	54.685755	4.758177	24.4	
25/08/2012	309_110#01	LB101	5	10:50:43	54.685714	4.758241	24.5	
25/08/2012	309_110#01	LB101	6	10:51:18	54.685644	4.758290	24.6	
25/08/2012	309_110#01	LB101	7	10:52:01	54.685612	4.758447	24.9	
25/08/2012	309_110#01	LB101	8	10:52:32	54.685577	4.758459	24.9	
25/08/2012	309_110#01	LB101	9	10:52:54	54.685553	4.758466	25.3	
25/08/2012	309_110#01	LB101	10	10:53:24	54.685507	4.758494	25.0	
25/08/2012	309_110#01	LB101	11	10:53:49	54.685484	4.758554	25.2	
25/08/2012	309_111#01	LB102	1	-				Clapper Board
25/08/2012	309_111#01	LB102	2	11:05:20	54.685900	4.756579	21.6	
25/08/2012	309_111#01	LB102	3	11:05:56	54.685814	4.756529	21.2	
25/08/2012	309_111#01	LB102	4	11:06:16	54.685780	4.756478	21.2	
25/08/2012	309_111#01	LB102	5	11:07:00	54.685712	4.756410	21.0	
25/08/2012	309_111#01	LB102	6	11:07:35	54.685676	4.756306	21.0	
25/08/2012	309_111#01	LB102	7	11:08:13	54.685622	4.756218	20.9	
25/08/2012	309_111#01	LB102	8	11:08:52	54.685541	4.756263	21.6	
25/08/2012	309_111#01	LB102	9	11:09:29	54.685420	4.756184	20.5	
25/08/2012	309_111#01	LB102	10	11:10:02	54.685384	4.756070	20.4	
25/08/2012	309_111#01	LB102	11	11:10:19	54.685363	4.756031	20.5	
25/08/2012	309_112#01	LB103	1	-				Clapper Board
25/08/2012	309_112#01	LB103	2	11:19:31	54.685142	4.754192	19.2	
25/08/2012	309_112#01	LB103	3	11:20:09	54.685093	4.754067	19.0	
25/08/2012	309_112#01	LB103	4	11:20:49	54.685009	4.754132	19.2	
25/08/2012	309_112#01	LB103	5	11:21:21	54.684997	4.754113	19.2	
25/08/2012	309_112#01	LB103	6	11:22:01	54.684978	4.754165	19.0	
25/08/2012	309_112#01	LB103	7	11:22:45	54.684925	4.754169	19.3	
25/08/2012	309_112#01	LB103	8	11:23:22	54.684907	4.754182	19.2	
25/08/2012	309_112#01	LB103	9	11:24:14	54.684883	4.754236	19.4	
25/08/2012	309_113#01	LB105	1	-				Clapper Board
25/08/2012	309_113#01	LB105	2	11:38:29	54.678780	4.730288	20.2	
25/08/2012	309_113#01	LB105	3	11:38:55	54.678770	4.730235	20.3	
25/08/2012	309_113#01	LB105	4	11:39:39	54.678735	4.730117	21.3	
25/08/2012	309_113#01	LB105	5	11:40:08	54.678698	4.729911	20.3	
25/08/2012	309_113#01	LB105	6	11:41:02	54.678583	4.729681	20.6	
25/08/2012	309_113#01	LB105	7	11:41:46	54.678492	4.729599	20.1	
25/08/2012	309_113#01	LB105	8	11:42:18	54.678513	4.729594	20.1	
25/08/2012	309_113#01	LB105	9	11:43:04	54.678549	4.729534	19.4	
25/08/2012	309_113#01	LB105	10	11:43:25	54.678559	4.729482	19.9	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
25/08/2012	309_114#01	LB011	1	-				Clapper Board
25/08/2012	309_114#01	LB011	2	12:26:56	54.719499	4.600231	13.5	
25/08/2012	309_114#01	LB011	3	12:27:43	54.719374	4.600209	13.5	
25/08/2012	309_114#01	LB011	4	12:28:13	54.719316	4.600150	13.5	
25/08/2012	309_114#01	LB011	5	12:28:39	54.719265	4.600200	13.6	
25/08/2012	309_114#01	LB011	6	12:28:59	54.719258	4.600227	13.6	
25/08/2012	309_114#01	LB011	7	12:29:22	54.719233	4.600275	13.6	
25/08/2012	309_114#01	LB011	8	12:30:03	54.719239	4.600285	13.5	
25/08/2012	309_114#01	LB011	9	12:30:34	54.719272	4.600245	13.5	
25/08/2012	309_114#01	LB011	10	12:30:56	54.719309	4.600202	13.6	
25/08/2012	309_114#01	LB011	11	12:31:34	54.719220	4.600259	13.6	
25/08/2012	309_115#01	LB010	1	-				Clapper Board
25/08/2012	309_115#01	LB010	2	12:38:06	54.720094	4.601467	13.5	
25/08/2012	309_115#01	LB010	3	12:38:48	54.720099	4.601235	13.0	
25/08/2012	309_115#01	LB010	4	12:39:19	54.720055	4.601163	13.5	
25/08/2012	309_115#01	LB010	5	12:39:50	54.719979	4.601053	13.5	
25/08/2012	309_115#01	LB010	6	12:40:26	54.719923	4.600951	13.5	
25/08/2012	309_115#01	LB010	7	12:41:01	54.719876	4.600825	13.4	
25/08/2012	309_115#01	LB010	8	12:41:36	54.719821	4.600758	13.3	
25/08/2012	309_115#01	LB010	9	12:42:11	54.719883	4.600623	13.4	
25/08/2012	309_115#01	LB010	10	12:42:35	54.719857	4.600506	13.4	
25/08/2012	309_115#01	LB010	11	12:42:53	54.719784	4.600354	13.8	
25/08/2012	309_116#01	LB012	1	-				Clapper Board
25/08/2012	309_116#01	LB012	2	12:49:28	54.720894	4.601520	14.4	
25/08/2012	309_116#01	LB012	3	12:50:16	54.720856	4.601364	14.2	
25/08/2012	309_116#01	LB012	4	12:50:40	54.720807	4.601272	14.1	
25/08/2012	309_116#01	LB012	5	12:51:17	54.720661	4.601375	14.0	
25/08/2012	309_116#01	LB012	6	12:52:27	54.720577	4.601070	13.7	
25/08/2012	309_116#01	LB012	7	12:52:47	54.720553	4.600999	13.8	
25/08/2012	309_116#01	LB012	8	12:53:21	54.720442	4.600849	13.8	
25/08/2012	309_116#01	LB012	9	12:53:39	54.720409	4.600834	13.7	
25/08/2012	309_116#01	LB012	10	12:54:04	54.720361	4.600702	13.6	
25/08/2012	309_116#01	LB012	11	12:54:19	54.720361	4.600682	13.7	
25/08/2012	309_117#01	LB518	1	-				Clapper Board
25/08/2012	309_117#01	LB518	2	13:08:33	54.736616	4.592028	9.0	
25/08/2012	309_117#01	LB518	3	13:08:58	54.736645	4.591894	9.0	
25/08/2012	309_117#01	LB518	4	13:09:25	54.736586	4.591857	9.0	
25/08/2012	309_117#01	LB518	5	13:10:02	54.736490	4.591798	8.8	
25/08/2012	309_117#01	LB518	6	13:10:33	54.736454	4.591722	8.7	
25/08/2012	309_117#01	LB518	7	13:11:00	54.736384	4.591710	8.7	Camera video connection lost - line abandoned
25/08/2012	309_117#02	LB518	1	-				Clapper Board
25/08/2012	309_117#02	LB518	2	13:58:45	54.736687	4.591496	9.4	
25/08/2012	309_117#02	LB518	3	13:59:13	54.736669	4.591464	9.4	
25/08/2012	309_117#02	LB518	4	13:59:30	54.736673	4.591409	9.4	
25/08/2012	309_117#02	LB518	5	14:00:03	54.736644	4.591297	8.5	
25/08/2012	309_117#02	LB518	6	14:01:30	54.736529	4.590809	9.0	
25/08/2012	309_117#02	LB518	7	14:01:53	54.736515	4.590806	9.1	
25/08/2012	309_117#02	LB518	8	14:02:21	54.736519	4.590759	9.0	
25/08/2012	309_117#02	LB518	9	14:02:46	54.736544	4.590748	9.0	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
25/08/2012	309_117#02	LB518	10	14:03:08	54.736533	4.590684	8.9	
25/08/2012	309_117#02	LB518	11	14:03:33	54.736537	4.590760	9.2	
25/08/2012	309_118#01	LB508	1	-				Clapper Board
25/08/2012	309_118#01	LB508	2	14:47:27	54.729244	4.575006	8.8	
25/08/2012	309_118#01	LB508	3	14:47:50	54.729302	4.574947	8.4	
25/08/2012	309_118#01	LB508	4	14:48:58	54.729375	4.574627	7.5	
25/08/2012	309_118#01	LB508	5	14:49:25	54.729356	4.574509	7.7	Camera video connection lost - line abandoned
05/09/2012	309_119#01	LB003	1	-				Clapper Board
05/09/2012	309_119#01	LB003	2	08:07:49	54.712620	4.834953	17.7	
05/09/2012	309_119#01	LB003	3	08:08:16	54.712591	4.834904	17.7	
05/09/2012	309_119#01	LB003	4	08:08:48	54.712573	4.834800	17.5	
05/09/2012	309_119#01	LB003	5	08:09:30	54.712526	4.834690	17.5	
05/09/2012	309_119#01	LB003	6	08:09:57	54.712495	4.834632	17.6	
05/09/2012	309_119#01	LB003	7	08:10:41	54.712483	4.834495	17.6	
05/09/2012	309_119#01	LB003	8	08:11:09	54.712446	4.834428	17.8	
05/09/2012	309_119#01	LB003	9	08:11:45	54.712431	4.834342	17.9	
05/09/2012	309_119#01	LB003	10	08:12:40	54.712448	4.834179	17.8	
05/09/2012	309_120#01	LB001	1	-				Clapper Board
05/09/2012	309_120#01	LB001	2	-				Clapper Board
05/09/2012	309_120#01	LB001	3	08:20:26	54.711529	4.835181	17.2	
05/09/2012	309_120#01	LB001	4	08:20:58	54.711510	4.835194	17.5	
05/09/2012	309_120#01	LB001	5	08:21:45	54.711515	4.835134	17.6	
05/09/2012	309_120#01	LB001	6	08:22:32	54.711484	4.835174	17.6	
05/09/2012	309_120#01	LB001	7	08:23:07	54.711419	4.835231	17.5	
05/09/2012	309_120#01	LB001	8	08:23:47	54.711401	4.835219	17.6	
05/09/2012	309_120#01	LB001	9	08:24:20	54.711355	4.835285	17.6	
05/09/2012	309_120#01	LB001	10	08:24:54	54.711365	4.835258	17.5	
05/09/2012	309_120#01	LB001	11	08:25:22	54.711381	4.835190	17.5	
05/09/2012	309_121#01	LB002	1	-				Clapper Board
05/09/2012	309_121#01	LB002	2	08:33:22	54.710609	4.834942	17.6	
05/09/2012	309_121#01	LB002	3	08:33:53	54.710597	4.834992	17.8	
05/09/2012	309_121#01	LB002	4	08:34:17	54.710590	4.835010	17.6	
05/09/2012	309_121#01	LB002	5	08:34:55	54.710573	4.834964	17.7	
05/09/2012	309_121#01	LB002	6	08:35:30	54.710549	4.835117	17.4	
05/09/2012	309_121#01	LB002	7	08:36:11	54.710526	4.835160	17.6	
05/09/2012	309_121#01	LB002	8	08:36:39	54.710513	4.835248	17.5	
05/09/2012	309_121#01	LB002	9	08:37:25	54.710503	4.835341	17.5	
05/09/2012	309_121#01	LB002	10	08:37:57	54.710480	4.835408	17.5	
05/09/2012	309_122#01	LB422	1	-				Clapper Board
05/09/2012	309_122#01	LB422	2	09:04:29	54.676111	4.797453	19.5	
05/09/2012	309_122#01	LB422	3	09:04:57	54.676106	4.797506	19.2	
05/09/2012	309_122#01	LB422	4	09:05:31	54.676134	4.797533	19.4	
05/09/2012	309_122#01	LB422	5	09:06:00	54.676126	4.797567	19.0	
05/09/2012	309_122#01	LB422	6	09:06:24	54.676123	4.797565	19.0	
05/09/2012	309_122#01	LB422	7	09:06:58	54.676106	4.797629	19.1	
05/09/2012	309_122#01	LB422	8	09:07:29	54.676089	4.797639	18.9	
05/09/2012	309_122#01	LB422	9	09:08:23	54.676038	4.797688	19.0	
05/09/2012	309_122#01	LB422	10	09:08:42	54.676005	4.797721	19.0	
05/09/2012	309_122#01	LB422	11	09:09:00	54.676007	4.797758	19.0	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
05/09/2012	309_122#01	LB422	12	09:09:27	54.676046	4.797764	18.9	
05/09/2012	309_123#01	LB423	1	-				Clapper Board
05/09/2012	309_123#01	LB423	2	09:37:48	54.660132	4.814324	24.9	Line abdandoned - too much tide
05/09/2012	309_124#01	LB403	1	-				Clapper Board
05/09/2012	309_124#01	LB403	2	10:48:48	54.674580	4.692820	18.1	
05/09/2012	309_124#01	LB403	3	10:50:15	54.674634	4.693210	17.1	
05/09/2012	309_124#01	LB403	4	10:50:37	54.674657	4.693192	17.3	
05/09/2012	309_124#01	LB403	5	10:51:08	54.674630	4.693097	17.7	
05/09/2012	309_124#01	LB403	6	10:51:48	54.674558	4.693031	18.0	
05/09/2012	309_124#01	LB403	7	10:52:28	54.674529	4.693170	17.9	
05/09/2012	309_124#01	LB403	8	10:53:10	54.674483	4.693195	17.9	
05/09/2012	309_124#01	LB403	9	10:53:44	54.674433	4.693176	18.3	
05/09/2012	309_124#01	LB403	10	10:54:11	54.674373	4.693137	18.7	
05/09/2012	309_124#01	LB403	11	10:54:45	54.674314	4.693124	18.8	
05/09/2012	309_124#01	LB403	12	10:55:37	54.674248	4.693043	18.9	
05/09/2012	309_124#01	LB403	13	10:56:13	54.674183	4.692955	18.9	
05/09/2012	309_124#01	LB403	14	10:56:40	54.674140	4.692970	18.7	
05/09/2012	309_124#01	LB403	15	10:57:25	54.674096	4.692890	18.6	
05/09/2012	309_124#01	LB403	16	10:58:00	54.674033	4.692782	18.9	
05/09/2012	309_124#01	LB403	17	10:58:27	54.673999	4.692678	18.9	
05/09/2012	309_125#01	LB406	1	-				Clapper Board
05/09/2012	309_125#01	LB406	2	11:18:57	54.664644	4.699483	14.8	
05/09/2012	309_125#01	LB406	3	11:19:28	54.664615	4.699448	14.2	
05/09/2012	309_125#01	LB406	4	11:20:11	54.664574	4.699366	15.6	Camera video connection lost - line abandoned
05/09/2012	309_125#02	LB406	1	-				Clapper Board; Camera video connection lost - line abandoned
05/09/2012	309_126#01	LB304	1	-				Clapper Board
05/09/2012	309_126#01	LB304	2	13:39:42	54.656200	4.868520	13.6	
05/09/2012	309_126#01	LB304	3	13:41:42	54.656159	4.868391	13.8	
05/09/2012	309_126#01	LB304	4	13:42:13	54.656137	4.868356	13.6	
05/09/2012	309_126#01	LB304	5	13:42:43	54.656106	4.868274	13.8	
05/09/2012	309_126#01	LB304	6	13:43:06	54.656094	4.868202	13.8	
05/09/2012	309_126#01	LB304	7	13:43:44	54.656099	4.868261	13.8	
05/09/2012	309_126#01	LB304	8	13:44:27	54.656068	4.868242	13.7	
05/09/2012	309_126#01	LB304	9	13:45:00	54.656028	4.868221	13.7	
05/09/2012	309_126#01	LB304	10	13:45:36	54.655956	4.868176	13.8	
05/09/2012	309_126#01	LB304	11	13:45:58	54.655931	4.868148	13.9	
05/09/2012	309_127#01	LB303	1	-				Clapper Board
05/09/2012	309_127#01	LB303	2	13:53:44	54.647829	4.871355	12.6	
05/09/2012	309_127#01	LB303	3	13:54:12	54.647880	4.871420	12.6	
05/09/2012	309_127#01	LB303	4	13:54:40	54.647877	4.871473	12.3	
05/09/2012	309_127#01	LB303	5	13:55:13	54.647936	4.871453	12.8	
05/09/2012	309_127#01	LB303	6	13:55:48	54.647963	4.871463	12.3	
05/09/2012	309_127#01	LB303	7	13:56:40	54.647948	4.871538	12.5	
05/09/2012	309_127#01	LB303	8	13:57:17	54.647944	4.871588	12.3	
05/09/2012	309_127#01	LB303	9	13:57:41	54.647928	4.871599	12.3	
05/09/2012	309_127#01	LB303	10	13:58:24	54.647950	4.871708	12.2	
05/09/2012	309_127#01	LB303	11	13:58:52	54.647972	4.871771	12.2	
08/09/2012	309_128#01	LB308	1	-				Clapper Board

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
08/09/2012	309_128#01	LB308	2	09:52:47	54.655333	4.834933	21.8	
08/09/2012	309_128#01	LB308	3	09:53:13	54.655368	4.834925	21.7	
08/09/2012	309_128#01	LB308	4	09:53:50	54.655423	4.835057	21.8	
08/09/2012	309_128#01	LB308	5	09:54:21	54.655469	4.835105	21.8	
08/09/2012	309_128#01	LB308	6	09:54:54	54.655516	4.835090	21.8	
08/09/2012	309_128#01	LB308	7	09:55:38	54.655571	4.835120	21.8	
08/09/2012	309_128#01	LB308	8	09:56:17	54.655614	4.835163	22.1	
08/09/2012	309_128#01	LB308	9	09:56:54	54.655636	4.835219	22.2	
08/09/2012	309_128#01	LB308	10	09:57:29	54.655671	4.835284	22.6	
08/09/2012	309_129#01	LB423	1	-				Clapper Board
08/09/2012	309_129#01	LB423	2	10:10:41	54.658626	4.813174	25.5	
08/09/2012	309_129#01	LB423	3	10:11:19	54.658579	4.813235	25.5	
08/09/2012	309_129#01	LB423	4	10:12:05	54.658560	4.813300	25.3	
08/09/2012	309_129#01	LB423	5	10:12:41	54.658533	4.813233	25.5	
08/09/2012	309_129#01	LB423	6	10:13:11	54.658505	4.813205	25.6	
08/09/2012	309_129#01	LB423	7	10:13:31	54.658495	4.813210	25.3	
08/09/2012	309_129#01	LB423	8	10:13:48	54.658485	4.813248	25.3	
08/09/2012	309_129#01	LB423	9	10:14:16	54.658475	4.813249	28.0	
08/09/2012	309_129#01	LB423	10	10:14:49	54.658508	4.813191	25.5	
08/09/2012	309_129#01	LB423	11	10:15:26	54.658500	4.813307	25.3	
08/09/2012	309_129#01	LB423	12	10:15:38	54.658489	4.813321	25.5	
08/09/2012	309_130#01	LB420	1	-				Clapper Board
08/09/2012	309_130#01	LB420	2	10:28:47	54.642413	4.813549	29.4	
08/09/2012	309_130#01	LB420	3	10:29:06	54.642387	4.813553	29.7	
08/09/2012	309_130#01	LB420	4	10:29:32	54.642335	4.813525	28.5	
08/09/2012	309_130#01	LB420	5	10:30:13	54.642351	4.813642	28.6	
08/09/2012	309_130#01	LB420	6	10:30:40	54.642338	4.813709	29.5	
08/09/2012	309_130#01	LB420	7	10:31:48	54.642283	4.813672	27.7	
08/09/2012	309_130#01	LB420	8	10:32:11	54.642277	4.813769	28.2	
08/09/2012	309_130#01	LB420	9	10:32:50	54.642263	4.813606	28.4	
08/09/2012	309_130#01	LB420	10	10:33:14	54.642240	4.813618	28.6	
08/09/2012	309_130#01	LB420	11	10:33:50	54.642169	4.813539	28.4	
08/09/2012	309_131#01	LB424	1	-				Clapper Board
08/09/2012	309_131#01	LB424	2	10:53:40	54.659284	4.795908	22.7	
08/09/2012	309_131#01	LB424	3	10:54:14	54.659308	4.795983	22.5	
08/09/2012	309_131#01	LB424	4	10:54:50	54.659256	4.795953	22.6	
08/09/2012	309_131#01	LB424	5	10:56:03	54.659270	4.795358	22.1	
08/09/2012	309_131#01	LB424	6	10:56:46	54.659249	4.795411	21.8	
08/09/2012	309_131#01	LB424	7	10:57:09	54.659209	4.795495	22.1	
08/09/2012	309_131#01	LB424	8	10:57:30	54.659151	4.795485	21.8	
08/09/2012	309_131#01	LB424	9	10:58:43	54.659064	4.795263	21.5	
08/09/2012	309_132#01	LB421	1	-				Clapper Board
08/09/2012	309_132#01	LB421	2	11:10:17	54.663902	4.775543	21.4	
08/09/2012	309_132#01	LB421	3	11:10:45	54.663873	4.775607	21.3	
08/09/2012	309_132#01	LB421	4	11:11:14	54.663808	4.775525	21.4	
08/09/2012	309_132#01	LB421	5	11:11:54	54.663813	4.775697	21.4	
08/09/2012	309_132#01	LB421	6	11:12:24	54.663716	4.775557	22.2	
08/09/2012	309_132#01	LB421	7	11:13:02	54.663722	4.775665	22.2	
08/09/2012	309_132#01	LB421	8	11:14:40	54.663696	-4.775221	22.1	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
08/09/2012	309_132#01	LB421	9	11:15:22	54.663756	4.775208	21.3	
08/09/2012	309_132#01	LB421	10	11:15:46	54.663704	4.775160	21.5	
08/09/2012	309_133#01	LB414	1	-				Clapper Board
08/09/2012	309_133#01	LB414	2	11:35:21	54.655468	4.747047	23.9	
08/09/2012	309_133#01	LB414	3	11:35:35	54.655456	4.747018	24.0	
08/09/2012	309_133#01	LB414	4	11:36:13	54.655363	4.746906	23.9	
08/09/2012	309_133#01	LB414	5	11:36:37	54.655306	4.746836	24.0	
08/09/2012	309_133#01	LB414	6	11:38:00	54.655258	4.746365	24.2	
08/09/2012	309_133#01	LB414	7	11:38:19	54.655272	4.746402	23.9	
08/09/2012	309_133#01	LB414	8	11:38:54	54.655342	4.746355	23.9	
08/09/2012	309_133#01	LB414	9	11:39:13	54.655391	4.746338	24.0	
08/09/2012	309_133#01	LB414	10	11:39:27	54.655445	4.746350	24.1	
08/09/2012	309_134#01	LB412	1	-				Clapper Board
08/09/2012	309_134#01	LB412	2	12:01:27	54.658584	4.717810	21.1	
08/09/2012	309_134#01	LB412	3	12:02:05	54.658606	4.717680	20.9	
08/09/2012	309_134#01	LB412	4	12:02:33	54.658583	4.717498	21.1	
08/09/2012	309_134#01	LB412	5	12:03:13	54.658567	4.717336	21.3	
08/09/2012	309_134#01	LB412	6	12:03:36	54.658587	4.717256	20.8	
08/09/2012	309_134#01	LB412	7	12:04:04	54.658614	4.717121	21.3	
08/09/2012	309_134#01	LB412	8	12:04:25	54.658650	4.717066	21.3	
08/09/2012	309_134#01	LB412	9	12:05:07	54.658640	4.716998	21.1	
08/09/2012	309_134#01	LB412	10	12:05:17	54.658651	4.716955	21.1	
08/09/2012	309_134#01	LB412	11	12:05:42	54.658634	4.716853	21.4	
08/09/2012	309_134#01	LB412	12	12:06:10	54.658641	4.716794	21.3	
08/09/2012	309_135#01	LB411	1	-				Clapper Board
08/09/2012	309_135#01	LB411	2	12:18:50	54.651987	4.698191	22.7	
08/09/2012	309_135#01	LB411	3	12:20:00	54.651803	4.697837	22.3	
08/09/2012	309_135#01	LB411	4	12:20:35	54.651874	4.697892	22.3	
08/09/2012	309_135#01	LB411	5	12:21:00	54.651788	4.697742	22.6	
08/09/2012	309_135#01	LB411	6	12:21:29	54.651752	4.697617	22.5	
08/09/2012	309_135#01	LB411	7	12:22:08	54.651697	4.697368	22.3	
08/09/2012	309_135#01	LB411	8	12:22:30	54.651734	4.697422	22.3	
08/09/2012	309_135#01	LB411	9	12:22:53	54.651707	4.697423	22.2	
08/09/2012	309_135#01	LB411	10	12:23:35	54.651778	4.697347	22.5	
08/09/2012	309_135#01	LB411	11	12:23:56	54.651843	4.697357	22.4	
08/09/2012	309_136#01	LB408	1	-				Clapper Board
08/09/2012	309_136#01	LB408	2	12:37:02	54.661345	4.700932	21.0	
08/09/2012	309_136#01	LB408	3	12:37:34	54.661368	4.700826	20.9	
08/09/2012	309_136#01	LB408	4	12:38:05	54.661382	4.700682	20.9	
08/09/2012	309_136#01	LB408	5	12:38:43	54.661419	4.700600	21.0	
08/09/2012	309_136#01	LB408	6	12:39:20	54.661450	4.700520	20.7	
08/09/2012	309_136#01	LB408	7	12:40:07	54.661602	4.700426	20.9	
08/09/2012	309_136#01	LB408	8	12:41:08	54.661530	4.700147	20.7	
08/09/2012	309_136#01	LB408	9	12:41:46	54.661549	4.699988	20.9	
08/09/2012	309_136#01	LB408	10	12:42:09	54.661531	4.699884	21.2	
08/09/2012	309_136#01	LB408	11	12:42:37	54.661497	4.699857	20.8	
08/09/2012	309_136#01	LB408	12	12:43:20	54.661537	4.699913	21.0	
08/09/2012	309_136#01	LB408	13	12:43:40	54.661518	4.699817	20.9	
08/09/2012	309_136#01	LB408	14	12:43:57	54.661581	4.699814	21.1	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
08/09/2012	309_136#01	LB408	15	12:44:20	54.661599	4.699731	21.0	
08/09/2012	309_136#01	LB408	16	12:44:49	54.661649	4.699737	21.3	
08/09/2012	309_136#01	LB408	17	12:45:09	54.661629	4.699644	21.5	
08/09/2012	309_136#01	LB408	18	12:45:37	54.661663	4.699634	21.4	
08/09/2012	309_136#01	LB408	19	12:46:09	54.661616	4.699462	21.2	
08/09/2012	309_136#01	LB408	20	12:46:49	54.661590	4.699341	21.0	
08/09/2012	309_137#01	LB407	1	-				Clapper Board
08/09/2012	309_137#01	LB407	2	12:58:00	54.664398	4.705854	15.3	
08/09/2012	309_137#01	LB407	3	12:58:23	54.664375	4.705834	14.6	
08/09/2012	309_137#01	LB407	4	12:58:59	54.664419	4.705894	15.1	
08/09/2012	309_137#01	LB407	5	12:59:34	54.664326	4.705844	14.7	
08/09/2012	309_137#01	LB407	6	13:00:01	54.664312	4.705797	14.3	
08/09/2012	309_137#01	LB407	7	13:00:19	54.664306	4.705801	14.6	
08/09/2012	309_137#01	LB407	8	13:00:45	54.664181	4.705698	11.3	
08/09/2012	309_137#01	LB407	9	13:01:18	54.664176	4.705724	11.1	
08/09/2012	309_137#01	LB407	10	13:01:35	54.664142	4.705679	11.8	
08/09/2012	309_137#01	LB407	11	13:02:10	54.664221	4.705837	12.7	
08/09/2012	309_137#01	LB407	12	13:02:36	54.664202	4.705826	12.7	
08/09/2012	309_137#01	LB407	13	13:02:52	54.664171	4.705796	12.6	
08/09/2012	309_138#01	LB406	1	-				Clapper Board
08/09/2012	309_138#01	LB406	2	13:10:03	54.664726	4.699800	9.3	
08/09/2012	309_138#01	LB406	3	13:10:45	54.664572	4.699852	9.4	
08/09/2012	309_138#01	LB406	4	13:11:43	54.664420	4.699823	11.4	
08/09/2012	309_138#01	LB406	5	13:11:56	54.664414	4.699814	11.4	
08/09/2012	309_138#01	LB406	6	13:12:15	54.664395	4.699841	12.5	
08/09/2012	309_138#01	LB406	7	13:13:03	54.664258	4.700003	11.4	
08/09/2012	309_138#01	LB406	8	13:13:48	54.664199	4.700011	12.6	
08/09/2012	309_138#01	LB406	9	13:14:02	54.664170	4.700032	13.5	
08/09/2012	309_139#01	LB405	1	-				Clapper Board
08/09/2012	309_139#01	LB405	2	13:24:10	54.669622	4.702049	20.5	
08/09/2012	309_139#01	LB405	3	13:24:30	54.669581	4.702010	20.7	
08/09/2012	309_139#01	LB405	4	13:25:09	54.669529	4.702001	20.6	
08/09/2012	309_139#01	LB405	5	13:25:32	54.669531	4.702045	20.5	
08/09/2012	309_139#01	LB405	6	13:25:47	54.669522	4.702045	20.5	
08/09/2012	309_139#01	LB405	7	13:26:24	54.669464	4.702011	20.5	
08/09/2012	309_139#01	LB405	8	13:27:32	54.669453	4.701993	20.6	
08/09/2012	309_139#01	LB405	9	13:28:39	54.669418	4.702044	20.5	
08/09/2012	309_139#01	LB405	10	13:28:53	54.669414	4.702008	21.9	
08/09/2012	309_140#01	LB401	1	-				Clapper Board
08/09/2012	309_140#01	LB401	2	13:42:01	54.672688	4.695957	20.0	
08/09/2012	309_140#01	LB401	3	13:42:22	54.672675	4.695922	20.2	
08/09/2012	309_140#01	LB401	4	13:42:52	54.672606	4.695844	20.2	
08/09/2012	309_140#01	LB401	5	13:43:25	54.672648	4.695883	20.1	
08/09/2012	309_140#01	LB401	6	13:43:58	54.672635	4.695876	20.2	
08/09/2012	309_140#01	LB401	7	13:44:38	54.672623	4.695909	20.2	
08/09/2012	309_140#01	LB401	8	13:44:58	54.672609	4.695921	20.2	
08/09/2012	309_140#01	LB401	9	13:45:46	54.672538	4.695888	21.9	
08/09/2012	309_140#01	LB401	10	13:46:18	54.672524	4.695919	22.1	
08/09/2012	309_140#01	LB401	11	13:46:49	54.672478	4.695974	20.5	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
08/09/2012	309_140#01	LB401	12	13:47:07	54.672457	4.695954	20.5	
08/09/2012	309_140#01	LB401	13	13:47:23	54.672443	4.695942	20.3	
08/09/2012	309_140#01	LB401	14	13:47:42	54.672417	4.695924	20.5	
08/09/2012	309_140#01	LB401	15	13:48:28	54.672360	4.695942	20.5	
08/09/2012	309_140#01	LB401	16	13:48:48	54.672344	4.695924	20.3	
08/09/2012	309_140#01	LB401	17	13:49:12	54.672341	4.695887	20.2	
08/09/2012	309_140#01	LB401	18	13:50:13	54.672226	4.695781	20.5	
08/09/2012	309_140#01	LB401	19	13:51:05	54.672177	4.695672	20.5	
08/09/2012	309_140#01	LB401	20	13:51:32	54.672122	4.695616	20.4	
08/09/2012	309_141#01	LB404	1	-				Clapper Board
08/09/2012	309_141#01	LB404	2	14:00:09	54.674373	4.698177	20.8	
08/09/2012	309_141#01	LB404	3	14:00:38	54.674332	4.698211	20.6	
08/09/2012	309_141#01	LB404	4	14:01:05	54.674279	4.698186	20.6	
08/09/2012	309_141#01	LB404	5	14:01:31	54.674273	4.698235	20.6	
08/09/2012	309_141#01	LB404	6	14:02:14	54.674223	4.698271	20.7	
08/09/2012	309_141#01	LB404	7	14:02:36	54.674220	4.698365	20.6	
08/09/2012	309_141#01	LB404	8	14:03:09	54.674181	4.698408	21.2	
08/09/2012	309_141#01	LB404	9	14:03:42	54.674152	4.698502	20.6	
08/09/2012	309_141#01	LB404	10	14:04:25	54.674092	4.698561	20.6	
08/09/2012	309_142#01	LB410	1	-				Clapper Board
08/09/2012	309_142#01	LB410	2	14:21:11	54.656672	4.683206	22.3	
08/09/2012	309_142#01	LB410	3	14:21:48	54.656674	4.683336	22.4	
08/09/2012	309_142#01	LB410	4	14:22:18	54.656624	4.683356	22.2	
08/09/2012	309_142#01	LB410	5	14:22:57	54.656617	4.683546	22.2	
08/09/2012	309_142#01	LB410	6	14:23:34	54.656630	4.683674	22.2	
08/09/2012	309_142#01	LB410	7	14:24:06	54.656646	4.683716	22.3	
08/09/2012	309_142#01	LB410	8	14:24:36	54.656598	4.683789	23.5	
08/09/2012	309_142#01	LB410	9	14:24:58	54.656623	4.683850	22.6	
08/09/2012	309_142#01	LB410	10	14:25:16	54.656588	4.683881	22.3	
08/09/2012	309_142#01	LB410	11	14:25:37	54.656552	4.683972	22.3	
08/09/2012	309_142#01	LB410	12	14:25:55	54.656542	4.684040	22.3	
08/09/2012	309_143#01	LB610	1	-				Clapper Board
08/09/2012	309_143#01	LB610	2	14:40:48	54.669593	4.661389	24.6	
08/09/2012	309_143#01	LB610	3	14:41:16	54.669582	4.661295	24.7	
08/09/2012	309_143#01	LB610	4	14:41:49	54.669527	4.661214	23.9	
08/09/2012	309_143#01	LB610	5	14:42:43	54.669538	4.661050	24.3	
08/09/2012	309_143#01	LB610	6	14:42:56	54.669545	4.661004	24.3	
08/09/2012	309_143#01	LB610	7	14:43:17	54.669536	4.660943	24.4	
08/09/2012	309_143#01	LB610	8	14:43:47	54.669538	4.660853	24.3	
08/09/2012	309_143#01	LB610	9	14:44:11	54.669536	4.660772	24.3	
08/09/2012	309_143#01	LB610	10	14:44:42	54.669522	4.660669	24.6	
08/09/2012	309_143#01	LB610	11	14:45:12	54.669505	4.660603	24.9	
08/09/2012	309_143#01	LB610	12	14:45:35	54.669503	4.660537	24.8	
08/09/2012	309_144#01	LB609	1	-				Clapper Board
08/09/2012	309_144#01	LB609	2	14:55:49	54.673635	-4.643278	27.9	
08/09/2012	309_144#01	LB609	3	14:56:11	54.673609	4.643230	27.6	
08/09/2012	309_144#01	LB609	4	14:56:32	54.673613	4.643184	27.7	
08/09/2012	309_144#01	LB609	5	14:57:06	54.673598	4.643102	27.6	
08/09/2012	309_144#01	LB609	6	14:57:26	54.673564	4.643063	27.6	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
08/09/2012	309_144#01	LB609	7	14:58:05	54.673576	4.642954	27.4	
08/09/2012	309_144#01	LB609	8	14:58:51	54.673542	4.642963	27.7	
08/09/2012	309_144#01	LB609	9	14:59:16	54.673535	4.642897	27.8	
08/09/2012	309_144#01	LB609	10	14:59:46	54.673510	4.642826	27.8	
08/09/2012	309_144#01	LB609	11	15:00:16	54.673495	4.642749	27.7	
08/09/2012	309_144#01	LB609	12	15:00:45	54.673467	4.642727	27.4	
08/09/2012	309_145#01	LB608	1	-				Clapper Board
08/09/2012	309_145#01	LB608	2	15:13:20	54.677446	4.622442	27.5	
08/09/2012	309_145#01	LB608	3	15:13:47	54.677438	4.622423	27.3	
08/09/2012	309_145#01	LB608	4	15:13:57	54.677414	4.622453	27.2	
08/09/2012	309_145#01	LB608	5	15:14:26	54.677406	4.622450	27.3	
08/09/2012	309_145#01	LB608	6	15:15:00	54.677357	4.622387	27.2	
08/09/2012	309_145#01	LB608	7	15:15:16	54.677336	4.622369	27.2	
08/09/2012	309_145#01	LB608	8	15:15:50	54.677313	4.622356	27.2	
08/09/2012	309_145#01	LB608	9	15:16:24	54.677320	4.622328	27.3	
08/09/2012	309_145#01	LB608	10	15:16:49	54.677304	4.622359	26.3	
08/09/2012	309_145#01	LB608	11	15:17:12	54.677306	4.622370	26.4	
08/09/2012	309_145#01	LB608	12	15:17:40	54.677282	4.622365	27.3	
08/09/2012	309_145#01	LB608	13	15:18:04	54.677234	4.622460	27.2	
08/09/2012	309_146#01	LB607	1	-				Clapper Board
08/09/2012	309_146#01	LB607	2	15:32:22	54.687243	4.622388	28.6	
08/09/2012	309_146#01	LB607	3	15:32:44	54.687191	4.622324	28.5	
08/09/2012	309_146#01	LB607	4	15:33:12	54.687144	4.622285	28.3	
08/09/2012	309_146#01	LB607	5	15:33:48	54.687160	4.622306	28.5	
08/09/2012	309_146#01	LB607	6	15:34:27	54.687127	4.622309	28.6	
08/09/2012	309_146#01	LB607	7	15:34:49	54.687122	4.622288	28.5	
08/09/2012	309_146#01	LB607	8	15:35:24	54.687088	4.622261	28.5	
08/09/2012	309_146#01	LB607	9	15:35:56	54.687058	4.622295	28.6	
08/09/2012	309_146#01	LB607	10	15:36:22	54.687062	4.622298	28.5	
08/09/2012	309_146#01	LB607	11	15:36:40	54.687034	4.622338	28.6	
08/09/2012	309_147#01	LB602	1	-				Clapper Board
08/09/2012	309_147#01	LB602	2	15:51:13	54.680058	4.644725	22.1	
08/09/2012	309_147#01	LB602	3	15:51:48	54.680035	4.644764	22.3	
08/09/2012	309_147#01	LB602	4	15:52:23	54.679951	4.644858	23.9	
08/09/2012	309_147#01	LB602	5	15:53:12	54.679945	4.644931	28.8	
08/09/2012	309_147#01	LB602	6	15:53:50	54.679883	4.644949	25.0	
08/09/2012	309_147#01	LB602	7	15:54:29	54.679866	4.644983	25.7	
08/09/2012	309_147#01	LB602	8	15:55:14	54.679795	4.644966	25.7	
08/09/2012	309_147#01	LB602	9	15:55:50	54.679707	4.645047	26.1	
08/09/2012	309_147#01	LB602	10	15:56:17	54.679672	4.645122	26.2	
08/09/2012	309_147#01	LB602	11	15:56:51	54.679634	4.645241	26.3	
08/09/2012	309_147#01	LB602	12	15:57:07	54.679616	4.645206	26.5	
08/09/2012	309_147#01	LB602	13	15:57:39	54.679579	4.645166	26.4	
08/09/2012	309_147#01	LB602	14	15:58:09	54.679522	4.645194	26.4	
08/09/2012	309_147#01	LB602	15	15:58:34	54.679478	4.645278	26.3	
08/09/2012	309_147#01	LB602	16	15:59:10	54.679476	4.645309	37.6	
08/09/2012	309_147#01	LB602	17	15:59:38	54.679442	4.645298	26.3	
08/09/2012	309_147#01	LB602	18	15:59:59	54.679399	4.645439	26.8	
08/09/2012	309_147#01	LB602	19	16:00:18	54.679396	4.645504	26.9	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
08/09/2012	309_147#01	LB602	20	16:00:39	54.679401	4.645519	26.8	
08/09/2012	309_148#01	LB603	1	-				Clapper Board
08/09/2012	309_148#01	LB603	2	16:10:17	54.681003	4.659955	25.2	
08/09/2012	309_148#01	LB603	3	16:10:54	54.680976	4.659895	23.7	
08/09/2012	309_148#01	LB603	4	16:11:22	54.680954	4.659843	23.5	
08/09/2012	309_148#01	LB603	5	16:11:42	54.680928	4.659838	23.4	
08/09/2012	309_148#01	LB603	6	16:12:14	54.680864	4.659779	23.8	
08/09/2012	309_148#01	LB603	7	16:12:56	54.680851	4.659817	25.5	
08/09/2012	309_148#01	LB603	8	16:13:37	54.680803	4.659836	23.8	
08/09/2012	309_148#01	LB603	9	16:14:02	54.680760	4.659875	23.7	
08/09/2012	309_148#01	LB603	10	16:14:32	54.680718	4.659932	23.8	
08/09/2012	309_148#01	LB603	11	16:14:57	54.680674	4.659979	23.8	
10/09/2012	309_149#01	LB319	1	-				Clapper Board
10/09/2012	309_149#01	LB319	2	08:54:37	54.642593	4.865058	13.2	
10/09/2012	309_149#01	LB319	3	08:55:00	54.642586	4.865001	13.3	
10/09/2012	309_149#01	LB319	4	08:55:22	54.642570	4.865012	14.3	
10/09/2012	309_149#01	LB319	5	08:55:53	54.642614	4.865072	14.3	
10/09/2012	309_149#01	LB319	6	08:56:16	54.642637	4.865051	14.2	
10/09/2012	309_149#01	LB319	7	08:56:50	54.642655	4.865026	14.2	
10/09/2012	309_149#01	LB319	8	08:57:21	54.642658	4.865013	13.0	
10/09/2012	309_149#01	LB319	9	08:58:00	54.642686	4.865044	14.3	
10/09/2012	309_149#01	LB319	10	08:58:14	54.642693	4.865029	14.2	
10/09/2012	309_149#01	LB319	11	08:58:52	54.642719	4.864977	14.2	
10/09/2012	309_149#01	LB319	12	08:59:17	54.642734	4.864970	14.4	
10/09/2012	309_150#01	LB415	1	-				Clapper Board
10/09/2012	309_150#01	LB415	2	09:27:26	54.673184	4.759465	30.0	
10/09/2012	309_150#01	LB415	3	09:28:11	54.673214	4.759705	31.1	
10/09/2012	309_150#01	LB415	4	09:28:33	54.673214	4.759706	31.0	
10/09/2012	309_150#01	LB415	5	09:29:11	54.673176	4.759703	31.7	
10/09/2012	309_150#01	LB415	6	09:29:38	54.673194	4.759711	31.4	
10/09/2012	309_150#01	LB415	7	09:30:16	54.673249	4.759743	31.6	
10/09/2012	309_150#01	LB415	8	09:30:46	54.673206	4.759796	32.1	
10/09/2012	309_150#01	LB415	9	09:31:05	54.673224	4.759831	32.3	
10/09/2012	309_150#01	LB415	10	09:31:41	54.673172	4.759918	32.9	
10/09/2012	309_150#01	LB415	11	09:31:53	54.673176	4.759913	32.8	
10/09/2012	309_151#01	LB108	1	-				Clapper Board
10/09/2012	309_151#01	LB108	2	09:42:22	54.675454	4.746670	23.0	
10/09/2012	309_151#01	LB108	3	09:42:50	54.675478	4.746725	23.0	
10/09/2012	309_151#01	LB108	4	09:43:08	54.675483	4.746756	23.1	
10/09/2012	309_151#01	LB108	5	09:43:47	54.675438	4.746817	23.2	
10/09/2012	309_151#01	LB108	6	09:44:10	54.675454	4.746893	23.0	
10/09/2012	309_151#01	LB108	7	09:44:48	54.675444	4.747144	22.8	
10/09/2012	309_151#01	LB108	8	09:45:28	54.675477	4.747286	23.1	
10/09/2012	309_151#01	LB108	9	09:45:48	54.675484	4.747279	22.7	
10/09/2012	309_151#01	LB108	10	09:46:24	54.675489	4.747304	23.1	
10/09/2012	309_151#01	LB108	11	09:46:48	54.675481	4.747327	23.1	
10/09/2012	309_151#01	LB108	12	09:47:09	54.675499	4.747386	23.0	
10/09/2012	309_152#01	LB110	1	-				Clapper Board
10/09/2012	309_152#01	LB110	2	10:05:37	54.682397	4.709781	20.7	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
10/09/2012	309_152#01	LB110	3	10:06:18	54.682399	4.709805	20.6	
10/09/2012	309_152#01	LB110	4	10:06:52	54.682406	4.709839	20.2	
10/09/2012	309_152#01	LB110	5	10:07:28	54.682402	4.709946	20.6	
10/09/2012	309_152#01	LB110	6	10:07:58	54.682446	4.710026	20.6	
10/09/2012	309_152#01	LB110	7	10:08:31	54.682446	4.710078	20.7	
10/09/2012	309_152#01	LB110	8	10:08:48	54.682431	4.710123	20.4	
10/09/2012	309_153#01	LB402	1	-				Clapper Board
10/09/2012	309_153#01	LB402	2	10:28:41	54.679236	4.695246	19.6	
10/09/2012	309_153#01	LB402	3	10:29:06	54.679228	4.695219	19.4	
10/09/2012	309_153#01	LB402	4	10:30:03	54.679137	4.695298	19.6	
10/09/2012	309_153#01	LB402	5	10:30:25	54.679131	4.695283	19.4	
10/09/2012	309_153#01	LB402	6	10:30:51	54.679088	4.695335	19.6	
10/09/2012	309_153#01	LB402	7	10:31:44	54.679047	4.695296	19.4	
10/09/2012	309_153#01	LB402	8	10:32:02	54.679042	4.695302	19.4	
10/09/2012	309_153#01	LB402	9	10:32:31	54.679021	4.695319	19.6	
10/09/2012	309_153#01	LB402	10	10:33:02	54.678982	4.695344	19.6	
10/09/2012	309_153#01	LB402	11	10:33:29	54.678995	4.695333	19.3	
10/09/2012	309_154#01	LB601	1	-				Clapper Board
10/09/2012	309_154#01	LB601	2	10:47:25	54.676417	4.671599	21.3	
10/09/2012	309_154#01	LB601	3	10:47:48	54.676442	4.671574	21.4	
10/09/2012	309_154#01	LB601	4	10:48:19	54.676490	4.671531	21.3	
10/09/2012	309_154#01	LB601	5	10:48:41	54.676522	4.671512	21.4	
10/09/2012	309_154#01	LB601	6	10:49:26	54.676521	4.671529	21.3	
10/09/2012	309_154#01	LB601	7	10:50:16	54.676555	4.671492	21.7	
10/09/2012	309_154#01	LB601	8	10:50:58	54.676594	4.671472	21.4	
10/09/2012	309_154#01	LB601	9	10:51:41	54.676644	4.671434	21.7	
10/09/2012	309_154#01	LB601	10	10:52:20	54.676601	4.671495	21.4	
10/09/2012	309_154#01	LB601	11	10:52:43	54.676598	4.671483	21.5	
10/09/2012	309_154#01	LB601	12	10:53:18	54.676627	4.671438	21.4	
10/09/2012	309_154#01	LB601	13	10:54:06	54.676656	4.671414	21.4	
10/09/2012	309_154#01	LB601	14	10:54:39	54.676664	4.671398	21.7	
10/09/2012	309_154#01	LB601	15	10:55:13	54.676646	4.671416	21.2	
10/09/2012	309_154#01	LB601	16	10:55:35	54.676678	4.671369	21.6	
10/09/2012	309_154#01	LB601	17	10:56:06	54.676722	4.671331	21.8	
10/09/2012	309_154#01	LB601	18	10:56:22	54.676740	4.671315	21.8	
10/09/2012	309_154#01	LB601	19	10:56:46	54.676748	4.671315	21.6	
10/09/2012	309_155#01	LB606	1	-				Clapper Board
10/09/2012	309_155#01	LB606	2	11:06:43	54.687424	4.662800	21.2	
10/09/2012	309_155#01	LB606	3	11:07:32	54.687449	4.662728	21.6	
10/09/2012	309_155#01	LB606	4	11:08:05	54.687441	4.662700	21.7	
10/09/2012	309_155#01	LB606	5	11:08:24	54.687436	4.662690	21.4	
10/09/2012	309_155#01	LB606	6	11:08:43	54.687447	4.662655	21.4	
10/09/2012	309_155#01	LB606	7	11:09:16	54.687466	4.662601	21.4	
10/09/2012	309_155#01	LB606	8	11:09:59	54.687472	4.662537	21.7	
10/09/2012	309_155#01	LB606	9	11:10:24	54.687481	4.662494	21.5	
10/09/2012	309_155#01	LB606	10	11:10:55	54.687472	4.662467	21.4	
10/09/2012	309_155#01	LB606	11	11:11:30	54.687481	4.662418	21.2	
10/09/2012	309_156#01	LB605	1	-				Clapper Board
10/09/2012	309_156#01	LB605	2	11:22:39	54.689481	4.679616	21.8	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
10/09/2012	309_156#01	LB605	3	11:23:09	54.689512	4.679578	21.9	
10/09/2012	309_156#01	LB605	4	11:23:44	54.689548	4.679541	21.8	
10/09/2012	309_156#01	LB605	5	11:24:19	54.689569	4.679522	21.8	
10/09/2012	309_156#01	LB605	6	11:24:47	54.689594	4.679508	21.8	
10/09/2012	309_156#01	LB605	7	11:25:19	54.689633	4.679508	21.7	
10/09/2012	309_156#01	LB605	8	11:25:56	54.689642	4.679550	21.9	
10/09/2012	309_156#01	LB605	9	11:26:29	54.689626	4.679605	21.7	
10/09/2012	309_156#01	LB605	10	11:27:01	54.689662	4.679630	22.1	
10/09/2012	309_156#01	LB605	11	11:27:24	54.689692	4.679567	21.8	
10/09/2012	309_157#01	LB604	1	-				Clapper Board
10/09/2012	309_157#01	LB604	2	11:47:25	54.682717	4.689251	21.3	
10/09/2012	309_157#01	LB604	3	11:48:01	54.682754	4.689310	21.1	
10/09/2012	309_157#01	LB604	4	11:48:28	54.682762	4.689407	21.3	
10/09/2012	309_157#01	LB604	5	11:49:11	54.682739	4.689500	21.3	
10/09/2012	309_157#01	LB604	6	11:49:43	54.682744	4.689565	21.1	
10/09/2012	309_157#01	LB604	7	11:49:59	54.682750	4.689581	21.1	
10/09/2012	309_157#01	LB604	8	11:50:39	54.682824	4.689529	21.3	
10/09/2012	309_157#01	LB604	9	11:51:09	54.682829	4.689486	21.1	
10/09/2012	309_157#01	LB604	10	11:51:40	54.682867	4.689462	21.1	
10/09/2012	309_157#01	LB604	11	11:51:55	54.682850	4.689445	20.6	
10/09/2012	309_158#01	LB409	1	-				Clapper Board
10/09/2012	309_158#01	LB409	2	12:02:41	54.691262	4.698624	20.3	
10/09/2012	309_158#01	LB409	3	12:03:08	54.691287	4.698706	20.2	
10/09/2012	309_158#01	LB409	4	12:03:43	54.691267	4.698754	20.2	
10/09/2012	309_158#01	LB409	5	12:04:09	54.691236	4.698830	20.1	
10/09/2012	309_158#01	LB409	6	12:04:54	54.691211	4.698884	20.1	
10/09/2012	309_158#01	LB409	7	12:05:33	54.691173	4.698936	20.2	
10/09/2012	309_158#01	LB409	8	12:06:07	54.691154	4.699011	20.1	
10/09/2012	309_158#01	LB409	9	12:06:36	54.691143	4.699034	20.1	
10/09/2012	309_158#01	LB409	10	12:07:06	54.691131	4.699148	19.9	
10/09/2012	309_158#01	LB409	11	12:07:36	54.691127	4.699206	19.7	
10/09/2012	309_159#01	LB116	1	-				Clapper Board
10/09/2012	309_159#01	LB116	2	12:28:28	54.690474	4.746270	18.1	
10/09/2012	309_159#01	LB116	3	12:28:49	54.690422	4.746288	18.0	
10/09/2012	309_159#01	LB116	4	12:29:25	54.690357	4.746286	18.1	
10/09/2012	309_159#01	LB116	5	12:30:10	54.690293	4.746161	18.1	
10/09/2012	309_159#01	LB116	6	12:30:38	54.690250	4.746098	18.1	
10/09/2012	309_159#01	LB116	7	12:31:28	54.690171	4.746027	18.1	
10/09/2012	309_159#01	LB116	8	12:32:09	54.690118	4.745945	18.4	
10/09/2012	309_159#01	LB116	9	12:32:45	54.690070	4.745871	18.4	
10/09/2012	309_159#01	LB116	10	12:33:23	54.690036	4.745801	18.2	
10/09/2012	309_159#01	LB116	11	12:33:34	54.690015	4.745753	18.2	
10/09/2012	309_159#01	LB116	12	12:34:08	54.689970	4.745698	18.4	
10/09/2012	309_159#01	LB116	13	12:34:40	54.689935	4.745644	18.4	
10/09/2012	309_159#01	LB116	14	12:35:20	54.689949	4.745577	18.1	
10/09/2012	309_159#01	LB116	15	12:36:05	54.689975	4.745606	18.4	
10/09/2012	309_159#01	LB116	16	12:36:37	54.689936	4.745625	18.3	
10/09/2012	309_159#01	LB116	17	12:37:12	54.689905	4.745738	18.4	
10/09/2012	309_159#01	LB116	18	12:37:32	54.689875	4.745753	18.4	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
10/09/2012	309_159#01	LB116	19	12:38:00	54.689843	4.745697	18.4	
10/09/2012	309_160#01	LB118	1	-				Clapper Board
10/09/2012	309_160#01	LB118	2	12:46:26	54.688405	4.745645	19.2	
10/09/2012	309_160#01	LB118	3	12:46:50	54.688366	4.745681	19.3	
10/09/2012	309_160#01	LB118	4	12:47:19	54.688321	4.745679	19.3	
10/09/2012	309_160#01	LB118	5	12:47:38	54.688295	4.745644	19.3	
10/09/2012	309_160#01	LB118	6	12:48:12	54.688257	4.745609	19.5	
10/09/2012	309_160#01	LB118	7	12:48:50	54.688237	4.745662	19.2	
10/09/2012	309_160#01	LB118	8	12:49:12	54.688215	4.745666	19.2	
10/09/2012	309_160#01	LB118	9	12:49:53	54.688164	4.745607	19.4	
10/09/2012	309_160#01	LB118	10	12:50:18	54.688127	4.745585	19.3	
10/09/2012	309_160#01	LB118	11	12:50:43	54.688074	4.745597	19.3	
10/09/2012	309_160#01	LB118	12	12:51:12	54.688041	4.745586	19.4	
10/09/2012	309_161#01	LB115	1	-				Clapper Board
10/09/2012	309_161#01	LB115	2	12:59:33	54.693768	4.747711	17.5	
10/09/2012	309_161#01	LB115	3	13:00:18	54.693749	4.747726	17.5	
10/09/2012	309_161#01	LB115	4	13:00:49	54.693677	4.747784	17.6	
10/09/2012	309_161#01	LB115	5	13:01:29	54.693627	4.747654	18.0	
10/09/2012	309_161#01	LB115	6	13:02:14	54.693602	4.747653	17.6	
10/09/2012	309_161#01	LB115	7	13:02:46	54.693572	4.747724	17.6	
10/09/2012	309_161#01	LB115	8	13:03:10	54.693555	4.747716	17.6	
10/09/2012	309_161#01	LB115	9	13:03:52	54.693529	4.747668	17.6	
10/09/2012	309_161#01	LB115	10	13:04:31	54.693482	4.747598	17.6	
10/09/2012	309_161#01	LB115	11	13:05:12	54.693442	4.747535	17.5	
10/09/2012	309_161#01	LB115	12	13:05:39	54.693393	4.747559	17.5	
10/09/2012	309_161#01	LB115	13	13:06:15	54.693328	4.747605	17.6	
10/09/2012	309_161#01	LB115	14	13:06:45	54.693282	4.747603	17.7	
10/09/2012	309_161#01	LB115	15	13:07:31	54.693226	4.747549	17.7	
10/09/2012	309_161#01	LB115	16	13:08:10	54.693173	4.747564	17.7	
10/09/2012	309_161#01	LB115	17	13:08:29	54.693133	4.747565	17.8	
10/09/2012	309_161#01	LB115	18	13:09:01	54.693083	4.747503	18.0	
10/09/2012	309_161#01	LB115	19	13:09:35	54.693032	4.747483	17.7	
10/09/2012	309_161#01	LB115	20	13:09:56	54.693021	4.747401	17.6	
10/09/2012	309_162#01	LB119	1	-				Clapper Board
10/09/2012	309_162#01	LB119	2	13:19:38	54.695028	4.747909	17.2	
10/09/2012	309_162#01	LB119	3	13:19:51	54.695018	4.747843	17.3	
10/09/2012	309_162#01	LB119	4	13:20:23	54.694981	4.747763	17.0	
10/09/2012	309_162#01	LB119	5	13:20:52	54.694968	4.747672	16.9	
10/09/2012	309_162#01	LB119	6	13:21:22	54.694953	4.747549	17.3	
10/09/2012	309_162#01	LB119	7	13:21:54	54.694934	4.747438	17.1	
10/09/2012	309_162#01	LB119	8	13:22:27	54.694941	4.747501	17.1	
10/09/2012	309_162#01	LB119	9	13:22:45	54.694923	4.747463	17.4	
10/09/2012	309_162#01	LB119	10	13:23:10	54.694893	4.747394	17.2	
10/09/2012	309_162#01	LB119	11	13:23:40	54.694854	4.747349	17.4	
10/09/2012	309_162#01	LB119	12	13:24:20	54.694805	4.747294	17.3	
10/09/2012	309_162#01	LB119	13	13:24:38	54.694785	4.747268	17.3	
10/09/2012	309_163#01	LB120	1	-				Clapper Board
10/09/2012	309_163#01	LB120	2	13:34:44	54.697115	4.747876	17.1	
10/09/2012	309_163#01	LB120	3	13:35:07	54.697091	4.747868	16.7	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
10/09/2012	309_163#01	LB120	4	13:35:38	54.697063	4.747826	16.7	
10/09/2012	309_163#01	LB120	5	13:36:11	54.697051	4.747736	16.7	
10/09/2012	309_163#01	LB120	6	13:36:35	54.697029	4.747687	16.7	
10/09/2012	309_163#01	LB120	7	13:36:50	54.697022	4.747649	17.0	
10/09/2012	309_163#01	LB120	8	13:37:20	54.697024	4.747538	16.7	
10/09/2012	309_163#01	LB120	9	13:37:47	54.696994	4.747601	16.5	
10/09/2012	309_163#01	LB120	10	13:38:26	54.696952	4.747644	16.7	
10/09/2012	309_163#01	LB120	11	13:39:00	54.696951	4.747494	16.8	
10/09/2012	309_163#01	LB120	12	13:39:34	54.696941	4.747289	16.8	
10/09/2012	309_164#01	LB121	1	-				Clapper Board
10/09/2012	309_164#01	LB121	2	13:48:19	54.700517	4.748408	16.3	
10/09/2012	309_164#01	LB121	3	13:48:44	54.700522	4.748445	16.3	
10/09/2012	309_164#01	LB121	4	13:49:22	54.700546	4.748447	16.7	
10/09/2012	309_164#01	LB121	5	13:49:54	54.700482	4.748539	16.1	
10/09/2012	309_164#01	LB121	6	13:50:15	54.700446	4.748596	16.1	
10/09/2012	309_164#01	LB121	7	13:50:44	54.700433	4.748602	16.7	
10/09/2012	309_164#01	LB121	8	13:51:05	54.700394	4.748674	16.4	
10/09/2012	309_164#01	LB121	9	13:51:31	54.700346	4.748701	16.3	
10/09/2012	309_164#01	LB121	10	13:52:02	54.700340	4.748735	16.1	
10/09/2012	309_164#01	LB121	11	13:52:22	54.700364	4.748818	16.1	
10/09/2012	309_164#01	LB121	12	13:52:48	54.700333	4.748829	16.3	
10/09/2012	309_164#01	LB121	13	13:53:01	54.700317	4.748837	16.4	
10/09/2012	309_165#01	LB122	1	-				Clapper Board
10/09/2012	309_165#01	LB122	2	14:01:35	54.705473	4.750126	18.0	
10/09/2012	309_165#01	LB122	3	14:02:19	54.705416	4.750048	18.2	
10/09/2012	309_165#01	LB122	4	14:02:41	54.705395	4.749990	18.0	
10/09/2012	309_165#01	LB122	5	14:03:09	54.705367	4.749908	18.0	
10/09/2012	309_165#01	LB122	6	14:03:36	54.705339	4.749853	18.2	
10/09/2012	309_165#01	LB122	7	14:04:09	54.705312	4.749774	18.1	
10/09/2012	309_165#01	LB122	8	14:04:38	54.705276	4.749742	18.1	
10/09/2012	309_165#01	LB122	9	14:05:12	54.705247	4.749696	18.0	
10/09/2012	309_165#01	LB122	10	14:05:51	54.705209	4.749611	18.2	
10/09/2012	309_165#01	LB122	11	14:06:20	54.705181	4.749503	18.0	
10/09/2012	309_166#01	LB117	1	-				Clapper Board
10/09/2012	309_166#01	LB117	2	14:18:43	54.691494	4.754696	18.0	
10/09/2012	309_166#01	LB117	3	14:19:09	54.691510	4.754645	17.6	
10/09/2012	309_166#01	LB117	4	14:19:34	54.691509	4.754641	17.6	
10/09/2012	309_166#01	LB117	5	14:20:15	54.691482	4.754754	18.1	
10/09/2012	309_166#01	LB117	6	14:20:52	54.691494	4.754703	18.0	
10/09/2012	309_166#01	LB117	7	14:21:32	54.691505	4.754626	17.6	
10/09/2012	309_166#01	LB117	8	14:21:57	54.691511	4.754582	17.4	
10/09/2012	309_166#01	LB117	9	14:22:23	54.691495	4.754484	17.5	
10/09/2012	309_166#01	LB117	10	14:22:56	54.691476	4.754480	17.2	
10/09/2012	309_166#01	LB117	11	14:23:29	54.691461	4.754408	17.2	
10/09/2012	309_167#01	LB416	1	-				Clapper Board
10/09/2012	309_167#01	LB416	2	14:38:36	54.687861	4.774793	19.9	
10/09/2012	309_167#01	LB416	3	14:39:07	54.687826	4.774811	20.1	
10/09/2012	309_167#01	LB416	4	14:39:44	54.687792	4.774802	20.2	
10/09/2012	309_167#01	LB416	5	14:40:34	54.687741	4.774757	20.1	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
10/09/2012	309_167#01	LB416	6	14:40:56	54.687727	4.774676	20.3	
10/09/2012	309_167#01	LB416	7	14:41:17	54.687724	4.774602	20.0	
10/09/2012	309_167#01	LB416	8	14:41:29	54.687704	4.774571	20.1	
10/09/2012	309_168#01	LB508	1	-				Clapper Board
10/09/2012	309_168#01	LB508	2	15:30:09	54.728937	4.574111	9.1	
10/09/2012	309_168#01	LB508	3	15:30:29	54.728888	4.574134	8.6	
10/09/2012	309_168#01	LB508	4	15:31:05	54.728864	4.574238	8.9	
10/09/2012	309_168#01	LB508	5	15:31:31	54.728807	4.574149	9.3	
10/09/2012	309_168#01	LB508	6	15:31:57	54.728758	4.574148	9.3	
10/09/2012	309_168#01	LB508	7	15:32:32	54.728659	4.574103	11.0	
10/09/2012	309_168#01	LB508	8	15:33:00	54.728613	4.574091	10.2	
10/09/2012	309_168#01	LB508	9	15:33:24	54.728567	4.574076	10.1	
10/09/2012	309_168#01	LB508	10	15:33:46	54.728519	4.574056	10.1	
10/09/2012	309_168#01	LB508	11	15:34:21	54.728465	4.574032	10.5	
10/09/2012	309_168#01	LB508	12	15:34:45	54.728437	4.574057	10.3	
10/09/2012	309_168#01	LB508	13	15:34:59	54.728403	4.574082	11.1	
10/09/2012	309_169#01	LB509	1	-				Clapper Board
10/09/2012	309_169#01	LB509	2	15:44:52	54.724316	4.551848	10.2	
10/09/2012	309_169#01	LB509	3	15:45:22	54.724271	4.551837	10.2	
10/09/2012	309_169#01	LB509	4	15:45:56	54.724205	4.551734	10.6	
10/09/2012	309_169#01	LB509	5	15:46:38	54.724240	4.551805	10.5	
10/09/2012	309_169#01	LB509	6	15:47:11	54.724197	4.551839	10.5	
10/09/2012	309_169#01	LB509	7	15:48:20	54.724112	4.551776	10.9	
10/09/2012	309_169#01	LB509	8	15:48:40	54.724076	4.551738	10.9	
10/09/2012	309_169#01	LB509	9	15:48:59	54.724050	4.551713	11.3	
10/09/2012	309_169#01	LB509	10	15:49:39	54.724034	4.551685	11.2	
10/09/2012	309_169#01	LB509	11	15:49:53	54.724010	4.551632	11.0	
10/09/2012	309_170#01	LB519	1	-				Clapper Board
10/09/2012	309_170#01	LB519	2	16:12:49	54.704044	4.510414	14.6	
10/09/2012	309_170#01	LB519	3	16:14:00	54.703950	4.510448	14.7	
10/09/2012	309_170#01	LB519	4	16:14:21	54.703931	4.510484	14.7	
10/09/2012	309_170#01	LB519	5	16:14:50	54.703936	4.510536	14.7	
10/09/2012	309_170#01	LB519	6	16:15:19	54.703927	4.510574	14.8	Camera connection lost - line abandoned
10/09/2012	309_170#02	LB519	1	-				Clapper Board
10/09/2012	309_170#02	LB519	2	16:37:51	54.704249	4.510186	13.4	
10/09/2012	309_170#02	LB519	3	16:38:31	54.704210	4.510177	13.8	
10/09/2012	309_170#02	LB519	4	16:39:12	54.704216	4.510165	13.9	
10/09/2012	309_170#02	LB519	5	16:39:55	54.704199	4.510261	13.7	
10/09/2012	309_170#02	LB519	6	16:40:25	54.704164	4.510197	13.8	
10/09/2012	309_170#02	LB519	7	16:40:47	54.704119	4.510150	14.1	
10/09/2012	309_170#02	LB519	8	16:41:22	54.704079	4.510148	14.3	
10/09/2012	309_170#02	LB519	9	16:41:41	54.704060	4.510151	14.4	
10/09/2012	309_170#02	LB519	10	16:42:01	54.704039	4.510160	14.3	
10/09/2012	309_170#02	LB519	11	16:42:31	54.703999	4.510122	14.5	
10/09/2012	309_171#01	LB520	1	-				Clapper Board
10/09/2012	309_171#01	LB520	2	16:54:33	54.695460	4.480226	12.0	
10/09/2012	309_171#01	LB520	3	16:55:06	54.695425	4.480160	12.2	
10/09/2012	309_171#01	LB520	4	16:55:52	54.695352	4.480144	12.1	
10/09/2012	309_171#01	LB520	5	16:56:22	54.695313	4.480082	12.2	

Date	Sample #	Station #	Photo #	Time (GMT)	Position (WGS84)		Depth (m)	Comments
					Latitude (N)	Longitude (W)		
10/09/2012	309_171#01	LB520	6	16:56:43	54.695293	4.480063	12.4	
10/09/2012	309_171#01	LB520	7	16:57:13	54.695277	4.480090	12.2	
10/09/2012	309_171#01	LB520	8	16:57:40	54.695251	4.480059	11.7	
10/09/2012	309_171#01	LB520	9	16:58:14	54.695217	4.480157	11.8	Camera connection dropped out towards EOL
10/09/2012	309_172#01	LB521	1	-				Clapper Board
10/09/2012	309_172#01	LB521	2	17:17:53	54.683396	4.437575	20.0	
10/09/2012	309_172#01	LB521	3	17:18:21	54.683365	4.437626	19.6	
10/09/2012	309_172#01	LB521	4	17:18:39	54.683363	4.437707	19.8	
10/09/2012	309_172#01	LB521	5	17:19:09	54.683359	4.437780	19.7	
10/09/2012	309_172#01	LB521	6	17:19:26	54.683376	4.437820	19.7	
10/09/2012	309_172#01	LB521	7	17:19:46	54.683359	4.437839	19.7	
10/09/2012	309_172#01	LB521	8	17:20:13	54.683322	4.437846	19.7	
10/09/2012	309_172#01	LB521	9	17:20:52	54.683290	4.437908	19.6	
10/09/2012	309_172#01	LB521	10	17:21:14	54.683282	4.437945	19.6	
10/09/2012	309_172#01	LB521	11	17:21:40	54.683265	4.437977	19.7	
10/09/2012	309_172#01	LB521	12	17:21:58	54.683257	4.437995	19.7	
10/09/2012	309_172#01	LB521	13	17:22:24	54.683263	4.438019	19.4	
10/09/2012	309_172#01	LB521	14	17:22:50	54.683284	4.438062	19.7	
10/09/2012	309_172#01	LB521	15	17:23:10	54.683264	4.438037	19.7	
10/09/2012	309_172#01	LB521	16	17:23:37	54.683227	4.438021	19.9	

APPENDIX C. BENTHIC GRAB SURVEY FIELD LOG

All times are GMT
Positions are WGS84 Latitude and Longitude – Decimal Degrees (DD.DDDDDD)

Date	Time (GMT)	Station No.	Sample No	Position WGS84 (dd.dddddd)		Depth (m)	Fauna	Sediment Description	Smell	Grab vol. (%)	Accepted?	Comments
				Latitude (N)	Longitude (W)							
09/06/2013	09:38	LB602	309_173#01	54.761050	-4.587633	23.5	N/A	Coarse sand	N/A	80	N	Error in grab retrieval, flushed at surface
09/06/2013	09:41	LB602	309_173#02	54.761050	-4.587633	23.8	N/A	N/A	N/A	N/A	N	Empty at surface
09/06/2013	10:01	LB602	309_173#03	54.681617	-4.645717	24.9	N/A	N/A	N/A	N/A	N	Empty at surface.
09/06/2013	10:04	LB602	309_173#04	54.682367	-4.645133	25.1	N/A	Coarse sand	N/A	30	Y	
09/06/2013	10:31	LB115	309_174#01	54.694417	-4.745467	20.1	N/A	N/A	N/A	N/A	N	Empty at surface
09/06/2013	10:34	LB115	309_174#02	54.695533	-4.745633	20.1	N/A	N/A	N/A	N/A	N	Empty at surface. Weights added to grab
09/06/2013	10:45	LB115	309_174#03	54.693760	-4.747670	20.6	Maerl	Maerl	N/A	~20	Y	Bio A
09/06/2013	10:59	LB115	309_174#04	54.693760	-4.747670	19.8	Maerl	Maerl and coarse sand	N/A	~70	Y	Bio B
09/06/2013	11:17	LB115	309_174#05	54.693760	-4.747670	20.9	Maerl	Maerl	N/A	~20	Y	Bio C
09/06/2013	11:37	LB306	309_175#01	54.682683	-4.841433	17.7	N/A	N/A	N/A	N/A	N	Empty at surface
09/06/2013	11:40	LB306	309_175#02	54.681783	-4.842233	17.7	N/A	Coarse sand and shell	N/A	~20	Y	
09/06/2013	12:01	LB001	309_176#01	54.710567	-4.835317	23.8	N/A	Coarse sand	N/A	60	Y	
09/06/2013	12:26	LB316	309_177#01	54.717183	-4.894033	14.2	Various worms	Muddy-sand	N/A	~20	Y	
09/06/2013	12:46	LB211	309_178#01	54.739700	-4.910067	11.9	N/A	N/A	N/A	N/A	N	Cobble in jaw, sample lost
09/06/2013	12:48	LB211	309_178#02	54.739667	-4.909967	11.9	N/A	Sand and shell fragments	N/A	40	Y	
09/06/2013	13:08	LB202	309_179#01	54.767933	-4.894117	14.9	*Carcinus maenas*, various worms	Mud, clay, shell fragments	N/A	30	Y	
09/06/2013	13:27	LB206	309_180#01	54.781150	-4.914450	13.1	N/A	N/A	N/A	N/A	N	Cobble in jaw, sample lost
09/06/2013	13:30	LB206	309_180#02	54.781200	-4.914433	13.1	Large whelk	Sandy mud	N/A	~30	Y	
10/06/2013	10:50	LB016	309_181#01	54.810267	-4.930717	8.3	N/A		N/A	~10	N	Not accepted, insufficient quantity

Date	Time (GMT)	Station No.	Sample No	Position WGS84 (dd.dddddd)		Depth (m)	Fauna	Sediment Description	Smell	Grab vol. (%)	Accepted?	Comments
				Latitude (N)	Longitude (W)							
10/06/2013	10:54	LB016	309_181#02	54.810867	-4.931600	7.6	N/A		N/A	~30	Y	
10/06/2013	11:21	LB017	309_182#01	54.825417	-4.913117	6.3	N/A		N/A	20	Y	
10/06/2013	11:52	LB021	309_183#01	54.836483	-4.856450	12.7	N/A	Mud	N/A	20	Y	
10/06/2013	12:35	LB014	309_184#01	54.804967	-4.797967	18.2	N/A	Mud and shell fragments	N/A	40	Y	
10/06/2013	13:02	LB510	309_185#01	54.821217	-4.755483	13.7	N/A		N/A	N/A	N	Did not fire
10/06/2013	13:04	LB510	309_185#02	54.821633	-4.756200	13.1	N/A	Mud and clay	N/A	20	Y	Incorrect label in images - reads 185#01
10/06/2013	13:30	LB512	309_186#01	54.814617	-4.711467	14.4	N/A		N/A	10	N	Not accepted, insufficient quantity
10/06/2013	13:33	LB512	309_186#02	54.815533	-4.712367	13.9	N/A			10	Y	
10/06/2013	14:05	LB515	309_187#01	54.786283	-4.652183	17.2	N/A		N/A	0	N	Cobble in jaw, sample lost
10/06/2013	14:09	LB515	309_187#02	54.786983	-4.653550	16.9	N/A	N/A	N/A	0	N	Empty. Boat returned to original position before third attempt
10/06/2013	14:13	LB515	309_187#03	54.785617	-4.650800	17.6	Echinoids and ophiuroids	Mud and clay	N/A	30	Y	
10/06/2013	14:41	LB517	309_188#01	54.759333	-4.600717	15.7	N/A	N/A	N/A	0	N	Cobble in jaw, sample lost
10/06/2013	14:42	LB517	309_188#02	54.760250	-4.600583	14.6	N/A	N/A	N/A	0	N	V large (30x15x15 cm) rock in jaw. Jaws slightly misaligned
10/06/2013	14:49	LB517	309_188#03	54.758667	-4.600783	16.7	N/A	Sand and shell fragments	N/A	~30	Y	

APPENDIX D. VIDEO SURVEY BIOTOPES AND SPECIES BY STATION

SACFOR faunal abundances, biotopes as per Connor *et al*. (2004)

Station	LB517	LB517	LB517	LB516	LB515	LB514
Sample No.	1	2	3	1	1	1
Section	309_038#01	309_038#01	309_308#01	309_039#01	309_040#01	309_041#01
Biotope	SS.SSa.CMuSa	SS.SCS.CCS	SS.SSa.CMuSa	SS.SSa.CMuSa	SS.SSa.CMuSa	IR.HIR.KSed
Substrata	S Sh	sG Sh	gS Sh	S Sh	S Sh	G R
Paguridae	O		O	O		
Necora puber						O
NUDIBRANCHIA				O		
ASTEROIDEA	F				C	
Asterias rubens					C	F
OPHIUROIDEA					C	
Echinus esculentus						C
RHODOPHYCOTA foliose						C
RHODOPHYCOTA encrust.						R
Saccharina latissima						R

Line name	LB513	LB513	LB512	LB511	LB510	LB006
Sample number	309_042#01	309_042#01	309_043#01	309_044#01	309_045#01	309_046#01
Section	1	2	1	1	1	1
Biotope	IR.HIR.KFaR.FoR	SS.SCS.ICS	SS.SSa.IMuSa	IR.HIR.KSed	SS.SSa.IMuSa	SS.SCS.ICS
Substrata	GR	sG	S Sh	G R	S	(g)S Sh
PORIFERA erect		R				
ANTHOZOA	O					
Urticina sp.						O
Metridium senile	F					
Spirobranchus sp.	O			O		
BRACHYURA		F				
Majidae				R		
Cancer pagurus			F			
Portunidae	F					
Membraniporidae				R		
ASTEROIDEA	O		O		O	
Henricia sp.				F		
Asterias rubens	F	C	C		F	
OPHIUROIDEA					C	
Echinus esculentus	C					
TELEOSTEI	O					
Ctenolabrus rupestris	F					
PLEURONECTIFORMES			F			
RHODOPHYCOTA foliose	A			C		O
RHODOPHYCOTA encrust.	R					
Dilsea carnosa				R		
CHROMOPHYCOTA				R		
Chorda filum				R		
Laminaria sp.				R		
Laminaria hyperborea				A		
Saccharina latissima				R		
Saccorhiza polyschides				R		
Halidrys siliquosa				R		

Line name	LB004	LB005	LB313	LB315	LB316	LB209
Sample number	309_047#01	309_048#01	309_049#01	309_050#01	309_051#01	309_052#01
Section	1	1	1	1	1	1
Biotope	SS.SCS.ICS	SS.SCS.ICS	IR.HIR.Ksed. (LsacChoR)	IR.HIR.Ksed. (LsacChoR)	SS.SMx.IMx	SS.SMx.IMx
Substrata	(g)S Sh	(g)S Sh	G R	G R	(g)S Sh	(g)S Sh
Urticina sp.					O	
Sabellidae			O			
Paguridae						O
Pectinidae						O
Alcyonidium diaphanum	F					F
Membraniporidae			R	R		
Flustra foliacea		R				
ASTEROIDEA	F					
Crossaster papposus			O		F	
Asterias rubens				O		
OPHIUROIDEA					F	F
ASCIDIACEA solitary		R				
RHODOPHYCOTA foliose	R	R	A	O	O	O
RHODOPHYCOTA encrust.			R	R		
Dilsea carnosa				R		
CHROMOPHYCOTA			O	R		
Chorda filum			O	A	R	
Laminaria sp.			R	R		
Laminaria hyperborea			R			
Saccharina latissima			R			

Line name	LB210	LB211	LB211	LB213	LB214	LB215
Sample number	309_053#01	309_054#01	309_054#01	309_055#01	309_056#01	309_057#01
Section	1	1	2	1	1	1
Biotope	SS.SMx.IMx	SS.SMx.IMx	SS.SCS.ICS	SS.SMx.IMx	IR.HIR.Ksed	IR.HIR.Ksed
Substrata	sG Sh	gS Sh	S Sh	sG Sh	G	(m)sG
Urticina sp.		O				
Paguridae	O					
Pectinidae			O	O		
Membraniporidae					R	
ASTEROIDEA				F	F	O
Crossaster papposus						F
Asterias rubens	F			F		
TELEOSTEI		O				
RHODOPHYCOTA foliose	O	O	R	O	F	C
RHODOPHYCOTA encrust.	R			R	R	R
Dilsea carnosa					O	
Chorda filum					O	O
Laminaria sp.					R	
Laminaria hyperborea					O	
Saccharina latissima					O	
Halidrys siliquosa					R	

Line name	LB205	LB206	LB318	LB307	LB305	LB301
Sample number	309_058#01	309_059#01	309_060#01	309_061#01	309_062#01	309_063#01
Section	1	1	1	1	1	1
Biotope	SS.SSa.IMuSa	SS.SMx.IMx	IR.HIR.Ksed	IR.HIR.Ksed. (XKScrR)	IR.HIR.Ksed	CR.HCR.XFa. ByErSp
Substrata	S Sh	gS Sh	(s)G	G R	sG R	G R
PORIFERA erect						R
HYDROZOA						C
Alcyonium digitatum						O
Actiniaria		O		O		O
Urticina sp.						O
Actinothoe sphyrodeta						O
BALANOMORPHA						F
DECAPODA				O		
Cancer pagurus						O
Pectinidae					O	
BRYOZOA						C
Alcyonidium diaphanum						O
Membraniporidae				R		
Flustra foliacea						F
ASTEROIDEA		F				O
Crossaster papposus		F	F	F	F	C
Asterias rubens	F				O	F
Ophiura sp.	F					
Echinus esculentus					C	
RHODOPHYCOTA foliose		R	A	C	A	R
RHODOPHYCOTA encrust.			F	R	O	
Calliblepharis sp.			R			
Dilsea carnosa			R			
CHROMOPHYCOTA			O	O	O	R
Chorda filum					R	
Laminaria sp.			R	O		
Laminaria hyperborea			R	F	R	
Saccharina latissima				F	R	
Saccorhiza polyschides				R		
Halidrys siliquosa					R	

Line name	LB302	LB302	LB320	LB425	LB419
Sample number	309_064#01	309_064#01	309_065#01	309_066#01	309_067#01
Section	1	2	1	1	1
Biotope	SS.SCS.CCS	CR.HCR.XFa	SS.SCS.SCS	CR.HCR.FaT. (CTub)	CR.HCR.XFa
Substrata	G	G R	S R Sh	sG R	G R Sh
PORIFERA erect		R		R	
HYDROZOA	R	O		O	C
Tubularia indivisa				O	
Actiniaria				O	
Urticina sp.		F		F	C
Actinothoe sphyrodeta		O			
Spirobranchus sp.		R		O	O
BALANOMORPHA	R	R		F	
Paguridae					O
Portunidae					R
BRYOZOA	R	O		O	C
Alcyonidium diaphanum				F	O
Flustra foliacea	R	O			
ASTEROIDEA					O
Crossaster papposus		F		F	F
Henricia sp.				O	
Asterias rubens		F		O	F
Ophiothrix fragilis	O				
Echinus esculentus		C		C	C
Callionymus lyra		R			
RHODOPHYCOTA encrust.			R	R	R

Line name	LB418	LB413	LB107	LB106	LB103
Sample number	309_068#01	309_069#01	309_070#01	309_071#01	309_072#01
Section	1	1	1	1	1
Biotope	SS.SCS.CCS	CR.HCR.XFa	SS.SCS.CCS	SS.SCS.CCS	SS.SCS.CCS
Substrata	G R Sh	G R Sh	G Sh	G Sh	G Sh
PORIFERA erect				R	
HYDROZOA	R	O	O	O	O
Nemertesia sp.				R	
Alcyonium digitatum		R			
Actiniaria		R			
Urticina sp.	F	F	O	O	
Metridium senile		R			
Spirobranchus sp.	R	F	O		
BALANOMORPHA	O	C	O	O	
Paguridae			O	O	
Cancer pagurus		R			
Portunidae	R				
BRYOZOA				O	
Alcyonidium diaphanum		F	F		
Flustra foliacea		O	R	O	O
Crossaster papposus		F	O		
Asterias rubens	O	O	O	R	
Echinus esculentus		F		O	O
TELEOSTEI		R			
RHODOPHYCOTA foliose		R			
RHODOPHYCOTA encrust.	R	F	R	O	F

Line name	LB417	LB022	LB314	LB312	LB311	LB310
Sample number	309_073#01	309_074#01	309_076#01	309_077#01	309_078#01	309_079#01
Section	1	1	1	1	1	1
Biotope	SS.SMx.CMx .FluHyd	SS.SSa.IFiSa .(ScupHyd)	SS.SMp.KSwSS .LsacR	IR.HIR.KSed .(DesFilR)	IR.HIR.KSed	IR.HIR.KSed .(DesFilR)
Substrata	gS R	gS	msG	sG R	sG R	sG R
HYDROZOA	O					
Alcyonium digitatum	R					
Urticina sp.	O				R	O
Spirobranchus sp.	O					
BALANOMORPHA	O					
Paguridae		O				
Majidae				O		
Maja squinado				O		
Cancer pagurus	O					
Liocarcinus	R					
Pectinidae					O	
BRYOZOA	O					
Alcyonidium diaphanum	C	F				O
Membraniporidae				R	R	R
Flustra foliacea	O	R				
ASTEROIDEA			O			
Crossaster papposus	O		O	O	F	
Asterias rubens	O					F
Ophiura sp.		O				
Echinus esculentus	F					
TELEOSTEI	O		R	O	O	
Callionymus lyra					O	
RHODOPHYCOTA foliose	R		F	A	C	C
RHODOPHYCOTA encrust.	O			R	O	R
Calliblepharis sp.				C	R	
Dilsea carnosa				R	R	R
CHROMOPHYCOTA foliose	O	R			C	C
Desmarestia sp.						C
Chorda filum				O	O	O
Laminaria sp.				R	R	R
Laminaria hyperborea				R	R	R
Saccharina latissima				R	R	O
Halidrys siliquosa					R	

Line name	LB309	LB306	LB317	LB201	LB208	LB207
Sample number	309_080#01	309_081#01	309_082#01	309_083#01	309_084#01	309_085#01
Section	1	1	1	1	1	1
Biotope	IR.MIR.KR. LhypTX	SS.SCS.ICS.SSh	SS.SMx.IMx	SS.SMx.IMx	SS.SSa.CMuSa	SS.SMx.IMx
Substrata	sG R	G Sh	sG Sh	msG Sh	S Sh	gS Sh
PORIFERA erect	R					
HYDROZOA				O	O	O
Alcyonium digitatum	O	O		O		R
Actiniaria	O			O		
Urticina sp.		F				
Metridium senile						O
Serpulidae				F		F
Spirobranchus sp.	O			F		
Paguridae			F	O	O	O
Ebalia sp.			O			
Pectinidae				F		O
Alcyonidium diaphanum				O	O	
Membraniporidae	R					
Flustra foliacea	R			R		
ASTEROIDEA	O			F		F
Crossaster papposus	C	F				
Asterias rubens	C		F	F	F	
Leptasterias muelleri				F		
Ophiura sp.					F	F
Ophiura albida					F	
Echinus esculentus	A					F
Ascidiidae						R
TELEOSTEI						F
RHODOPHYCOTA foliose	A	O	F	R		R
RHODOPHYCOTA encrust.	O	R				
CHROMOPHYCOTA foliose		O				
Laminaria sp.	R					
Laminaria hyperborea	O					

Line name	LB212	LB203	LB417	LB109	LB111	LB112
Sample number	309_086#01	309_087#01	309_088#01	309_089#01	309_090#01	309_091#01
Section	1	1	1	1	1	1
Biotope	SS.SMx.IMx	SS.SMx.IMx	SS.SMx.CMx .FluHyd	SS.SMp.Mrl .Pcal	SS.SMp.Mrl .Pcal	SS.SMp.Mrl .Pcal
Substrata	sG Sh	sG Sh	S R	G Sh	G Sh	G Sh
PORIFERA erect			R			
HYDROZOA	O	O	O	O	O	O
Alcyonium digitatum			R			
Actiniaria		O	O	O	O	O
Urticina sp.			F			
Chaetopterus tube		O				
Serpulidae			O			
Paguridae		O			O	O
Galatheidae			O			
Cancer pagurus						F
Liocarcinus depurator						O
BRYOZOA			R			
Alcyonidium diaphanum			O			
Flustra foliacea			O	R	O	R
ASTEROIDEA	F	F		F	F	F
Crossaster papposus			F	F	F	
Henricia sp.	C					
Asterias rubens	F	F		F	F	F
Ophiura sp.	C					
Ophiura albida	F					
Echinus esculentus			C	O	F	C
Gobiidae		F				
RHODOPHYCOTA foliose	R	R	R	R		
RHODOPHYCOTA encrust.			O			
Phytomatolithon calcareum live				O	O	F
Phytomatolithon calcareum dead				F	F	C
CHROMOPHYCOTA foliose			R		R	

Line name	LB114	LB113	LB104	LB409	LB007	LB008
Sample number	309_092#01	309_093#01	309_094#01	309_095#01	309_096#01	309_097#01
Section	1	1	1	1	1	1
Biotope	SS.SMp.Mrl .Pcal	SS.SCS.CCS	SS.SCS.CCS	SS.SCS.CCS	SS.SSa.CMuSa	SS.SSa.CMuSa
Substrata	G Sh	sG Sh	sG Sh	sG R Sh	S	S
HYDROZOA		R	R	O	R	R
Actiniaria	O	O	F			
Urticina sp.			F	O		
Serpulidae			F			
Alcyonidium diaphanum				F		
Flustra foliacea	R	R	R	O	R	
ASTEROIDEA	F	O		F	F	F
Crossaster papposus		F		F		
Asterias rubens	F		F		F	F
Ophiura sp.					C	C
Echinus esculentus	A		C	C		
RHODOPHYCOTA foliose		R	R	R		
RHODOPHYCOTA encrust.		R	R	R		
Phytomatolithon calcareum live	C					
Phytomatolithon calcareum dead	A	R				
CHROMOPHYCOTA foliose			R			

Line name	LB009	LB014	LB013	LB015	LB020
Sample number	309_098#01	309_099#01	309_100#01	309_101#01	309_102#01
Section	1	1	1	1	1
Biotope	SS.SSa.CMuSa	SS.SSa.CMuSa	SS.SSa.CMuSa	SS.SSa.CMuSa	SS.SSa.IMuSa
Substrata	S	mS Sh	mS Sh	mS Sh	mS Sh
HYDROZOA	R	R	R	R	
Alcyonium digitatum		R			
Actiniaria		O			
Sabellidae		O			
Paguridae				O	O
ASTEROIDEA		F	F		
Asterias rubens		F	F	O	O
Ophiura sp.	C	F	C	C	C
Psammechinus miliaris		O			
TELEOSTEI			O		

Line name	LB019	LB021	LB018	LB017	LB016
Sample number	309_103#01	309_104#01	309_105#01	309_106#01	309_107#01
Section	1	1	1	1	1
Biotope	SS.SSa.IMuSa	SS.SSa.CMuSa	SS.SSa.IMuSa	SS.SSa.IMuSa	SS.SSa.IMuSa
Substrata	mS	mS Sh	mS	mS	mS
HYDROZOA		R			R
Terebellidae					O
Paguridae	O	O		O	O
GASTROPODA				O	
Euspira catena	R				
ASTEROIDEA	O	F		O	F
Asterias rubens		F	O		O
Ophiura sp.		C	F		C
TELEOSTEI		O			
CHROMOPHYCOTA foliose				R	
CHLOROPHYCOTA foliose				R	

Line name	LB202	LB204	LB101	LB102
Sample number	309_108#01	309_109#01	309_110#01	309_111#01
Section	1	1	1	1
Biotope	SS.SMx.CMx	SS.SMx.IMx	SS.SCS.CCS	SS.SCS.CCS
Substrata	mS	msG	sG Sh	sG Sh
HYDROZOA	R	F		O
Alcyonium digitatum	R			
Urticina sp.			F	F
Chaetopterus tube			O	
Serpulidae	O		O	O
Paguridae				O
Galatheidae			O	
Flustra foliacea			O	O
ASTEROIDEA	O	O	F	
Crossaster papposus			F	
Asterias rubens		F		
Ophiura sp.	O			
Echinus esculentus			C	C
TELEOSTEI		O		
RHODOPHYCOTA foliose		O	R	R
RHODOPHYCOTA encrust.		R	R	R

Line name	LB103	LB105	LB011	LB010	LB012	LB518
Sample number	309_112#01	309_113#01	309_114#01	309_115#01	309_116#01	309_117#01
Section	1	1	1	1	1	1
Biotope	SS.SCS.CCS	SS.SCS.CCS	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx	IR.HIR.KSed
Substrata	sG Sh	sG Sh	S Sh	S Sh	S Sh	G
HYDROZOA	R	O	O	O	O	
Nemertesia sp.			O	O	O	
Alcyonium digitatum						R
Actiniaria						O
Urticina sp.	F	O	O	F	O	
Serpulidae	O		F			O
Paguridae	F		O			
Onchidorididae			O		O	
Alcyonidium diaphanum		F	C	C	C	
Membraniporidae						R
Flustra foliacea		F			O	
ASTEROIDEA	F	F				F
Crossaster papposus	F			F	F	C
Asterias rubens		F	F	O	F	
Echinus esculentus	C	F				
RHODOPHYCOTA foliose	R	R	O			F
RHODOPHYCOTA encrust.	O	R				R
Chondrus crispus						O
CHROMOPHYCOTA foliose						C
Desmarestia sp.						O
Laminaria sp.						R

Line name	LB518	LB508	LB003	LB001	LB002	LB422
Sample number	309_117#02	309_118#01	309_119#01	309_120#01	309_121#01	309_122#01
Section	1	1	1	1	1	1
Biotope	IR.HIR.KSed	IR.MIR.KR.LhypTX	SS.SCS.CCS	SS.SCS.CCS	SS.SCS.CCS	CR.MCR.EcCr .UrtScr
Substrata	G	G	(g)S Sh	(g)S Sh	(g)S Sh	sG R
PORIFERA erect						R
HYDROZOA			O	O	O	
Nemertesia sp.			R			
Obelia genicuata		R				
Alcyonium digitatum	R					
Actiniaria				O		
Urticina sp.						F
Chaetopterus						O
Paguridae			O			
Alcyonidium diaphanum			F	F	F	
Membraniporidae	R	R				
Flustra foliacea					R	
ASTEROIDEA	O					O
Crossaster papposus	C		F			
Asterias rubens			O			F
Ophiura sp.			F	O	O	
Echinus esculentus						A
Carcharhiniformes		F				
RHODOPHYCOTA foliose	F	C		R	R	
RHODOPHYCOTA encrust.	R					C
Chondrus crispus	O					
Delesseria sanguinea	R					
CHROMOPHYCOTA foliose	C	C				
Dictyota dichotoma	R					
Desmarestia sp.	O					
Chorda filum		R				
Laminaria sp.	R	R				
Laminaria hyperborea	R	O				
Saccharina latissima	R					

Line name	LB423	LB403	LB406	LB304	LB303
Sample number	309_123#01	309_124#01	309_125#01	309_126#01	309_127#01
Section	1	1	1	1	1
Biotope	CR.MCR.EcCr.FaAlCr	CR.MCR.EcCr .FaAlCr.Flu	IR.MIR.KR.LhypTX	IR.HIR.KSed	IR.HIR.KSed
Substrata	sG R	(s)G R	(s)G R	sR	gS R
PORIFERA erect		R	R	R	
Esperiopsis fucorum				R	
HYDROZOA	O	F	O		
Nemertesia sp.		O	R		
Actiniaria	O				
Urticina sp.	C				
Serpulidae		O	O		
BALANOMORPHA	R	R			
DECAPODA				O	
Paguridae	O				
Cancer pagurus		O		F	
Liocarcinus sp.	O				
Pectinidae		O		O	
Alcyonidium diaphanum	O				
Flustra foliacea	O	C	F		
ASTEROIDEA	O	O	O		
Crossaster papposus	C	C		C	F
Asterias rubens	F	F			O
Echinus esculentus	C	C	C		
ASCIDIACEA solitary				O	
Carcharhiniformes	O				
TELEOSTEI		O		O	
RHODOPHYCOTA foliose		R	C	C	C
RHODOPHYCOTA encrust.	R	R	R	R	
CHROMOPHYCOTA foliose			R		R
Laminaria sp.			R	R	R
Saccharina latissima			R	R	F
Saccorhiza polyschides					R

Line name	LB308	LB423	LB420	LB424	LB421
Sample number	309_128#01	309_129#01	309_130#01	309_131#01	309_132#01
Section	1	1	1	1	1
Biotope	CR.MCR.EcCr .FaAlCr	CR.MCR.EcCr .FaAlCr	CR.HCR.XFa. ByErSp.DysAct	CR.MCR.EcCr .FaAlCr	CR.MCR.EcCr .FaAlCr
Substrata	S G	S G R	G R	S R	G R
PORIFERA erect			O		
PORIFERA encrust.		R	R	R	
HYDROZOA	O	O	F	O	O
Alcyonium digitatum			R	R	
Actiniaria	F	O	O	O	O
Urticina sp.	O		O		O
Actinothoe sphyrodeta			C	O	
Spirobranchus sp.	O	O		O	O
BALANOMORPHA	R	R		R	R
Ebalia sp.				O	
Cancer pagurus			O		
Necora puber			O		O
Calliostoma zizyphinum				O	
Flustra foliacea	F				
Crossaster papposus		C	C		C
Henricia sp.		O		O	
Asterias rubens	O	F	F		F
Ophiura sp.	O				
Echinus esculentus	A	A	A	C	C
ASCIDIACEA solitary			O		
TELEOSTEI		O	F		O
RHODOPHYCOTA foliose				R	
RHODOPHYCOTA encrust.	F	O		F	F

Line name	LB414	LB412	LB411	LB408
Sample number	309_133#01	309_134#01	309_135#01	309_136#01
Section	1	1	1	1
Biotope	CR.HCR.XFa	CR.HCR.XFa	SS.SMx.CMx.FluHyd	CR.MCR.EcCr.FaAlCr.(Adig)
Substrata	G	G R	sG Sh	G R
PORIFERA encrust.	R	R		R
Haliclona cinerea	R			R
HYDROZOA	O	O		R
Nemertesia sp.		O		
Alcyonium digitatum		R		O
Actiniaria	O	O		R
Urticina sp.	O	F	F	
Actinothoe sphyrodeta				R
Chaetopterus		O		
Sabellidae			O	
Spirobranchus sp.	O	O	O	
BALANOMORPHA	R	R	R	R
Calliostoma zizyphinum	O	O		O
Pecten maximus				O
Alcyonidium diaphanum		O	C	
Flustra foliacea	O	O	O	R
Crossaster papposus	F	F	C	F
Henricia sp.				O
Asterias rubens	O	F	O	O
Echinus esculentus	C	C		C
RHODOPHYCOTA foliose	R	R		
RHODOPHYCOTA encrust.		F	R	C

Line name	LB407	LB407	LB407	LB407
Sample number	309_137#01	309_137#01	309_137#01	309_137#01
Section	1	2	3	4
Biotope	SS.SCS.CCS	CR.HCR.FaT.MsenAct	IR.HIR.KSed.XKScrR	CR.HCR.FaT.MsenAct
Substrata	sG sh	R	R	R sh
Urticina sp.		C	F	C
Metridium senile		C		F
Actinothoe sphyrodeta		C		C
BALANOMORPHA		R	R	R
Membraniporidae			R	
Flustra foliacea				R
Asterias rubens	O			
Echinus esculentus	F	C	C	C
RHODOPHYCOTA foliose		O	F	O
RHODOPHYCOTA encrust.		F	O	O
CHROMOPHYCOTA foliose		O	F	O
Laminaria hyperborea			C	

Line name	LB406	LB405	LB401	LB404	LB404
Sample number	309_138#01	309_139#01	309_140#01	309_141#01	309_141#01
Section	1	1	1	1	2
Biotope	IR.MIR.KR.LhypTX	SS.SMx.CMx.FluHyd	CR.HCR.XFa.ByErSp.DysAct	CR.HCR.XFa.SpNemAdia	SS.SCS.CCS
Substrata	sR	G sh	G	G sh	gS sh
PORIFERA encrust.	R	R	O	R	
Haliclona cinerea			R		
HYDROZOA			F	O	
Nemertesia sp.			O		
Obelia genicuata	R				
Alcyonium digitatum		R	R		
Urticina sp.		C		O	
Actinothoe sphyrodeta			C		
BALANOMORPHA		C		R	
Paguridae		O			
Cancer pagurus			O		
Necora puber			F		
Calliostoma zizyphinum			O		
Alcyonidium diaphanum				A	O
Membraniporidae	O				
Flustra foliacea		O	R	O	
ASTEROIDEA	O	O	O		
Crossaster papposus				F	
Henricia sp.			F		
Asterias rubens	O	F	O	O	
Echinus esculentus	O	F	C		
TELEOSTEI				F	
RHODOPHYCOTA foliose	C		R		
RHODOPHYCOTA encrust.				R	
Delesseria sanguinea	R				
CHROMOPHYCOTA foliose	O				
Laminaria hyperborea	A				

Line name	LB410	LB410	LB610	LB609	LB608
Sample number	309_142#01	309_142#01	309_143#01	309_144#01	309_145#01
Section	1	2	1	1	1
Biotope	SS.SCS.CCS	CR.MCR.EcCr .(UrtScr)	CR.HCR.XFa .(ByErSp)	SS.SMx.CMx.FluHyd	SS.SCS.CCS
Substrata	sG sh	G sh	sG sh	sG	sG sh
PORIFERA encrust.			R		
Esperiopsis fucorum				R	
HYDROZOA		R	F	O	R
Actiniaria				O	
Urticina sp.	O	C	C		O
POLYCHAETA				R	
Chaetopterus					O
Spirobranchus sp.					O
BALANOMORPHA	R	R			
Calliostoma zizyphinum			R		
Pectinidae					O
BRYOZOA	R	R	C	O	O
Alcyonidium diaphanum	O		O	O	O
Flustra foliacea	R	R	R		
ASTEROIDEA				O	O
Crossaster papposus	F	F		F	F
Asterias rubens		O	O		O
Echinus esculentus		A	C	F	
RHODOPHYCOTA foliose			O	R	
RHODOPHYCOTA encrust.	R	C	F	R	R

Line name	LB607	LB602	LB603	LB319	LB415	LB108
Sample number	309_146#01	309_147#01	309_148#01	309_149#01	309_150#01	309_151#01
Section	1	1	1	1	1	1
Biotope	SS.SCS.CCS	SS.SCS.CCS	SS.SCS.CCS	SS.SSa.CMuSa	SS.SCS.CCS	SS.SCS.CCS
Substrata	gS	sG sh	sG sh	gmS sh	sG sh	sG sh
PORIFERA encrust.				R		
HYDROZOA		R	R	R	R	R
Nemertesia sp.	O					
Actiniaria						O
Urticina sp.			O			F
POLYCHAETA burrow				F		
POLYCHAETA cast				R		
Chaetopterus tube					O	
Paguridae					O	O
Majidae	O					
BRYOZOA	O	R	R	R	R	R
Alcyonidium diaphanum	F		O			
Vesicularia spinosa	O					
Flustra foliacea					R	
ASTEROIDEA	O	O				
Crossaster papposus					O	
Asterias rubens		O				
OPHIUROIDEA				C		
Ophiura albida	F					
Echinus esculentus		O			O	F
RHODOPHYCOTA foliose				O	R	O
Saccharina latissima				R		

Line name	LB110	LB402	LB601	LB606	LB605
Sample number	309_152#01	309_153#01	309_154#01	309_155#01	309_156#01
Section	1	1	1	1	1
Biotope	SS.SCS.CCS	CR.HCR.XFa. (FluCoAs.X)	SS.SMx.CMx. (FluHyd)	SS.SCS.CCS	SS.SCS.CCS
Substrata	sG sh	G sh	sG sh	gS	gS sh
PORIFERA encrust.		O			
HYDROZOA	R	O	R		
Nemertesia sp.		O		R	O
Alcyonium digitatum		R			
Cerianthus lloydii		O			
Actiniaria	O	F	F		
Urticina sp.		F	F		
POLYCHAETA burrow			O		O
Spirobranchus sp.			O		
BALANOMORPHA	R	O	O		
Paguridae		O	O		O
Calliostoma zizyphinum			O		
Pectinidae		O			
BRYOZOA	R	O	R		
Alcyonidium diaphanum	F			O	O
Flustra foliacea	R	A	O	R	
ASTEROIDEA					O
Crossaster papposus	F	F	F		F
Henricia sp.		O			
Asterias rubens	F	F	O		
Echinus esculentus	F	F	F		
RHODOPHYCOTA foliose			R		
RHODOPHYCOTA encrust.	R	O	R		
CHROMOPHYCOTA foliose		R			

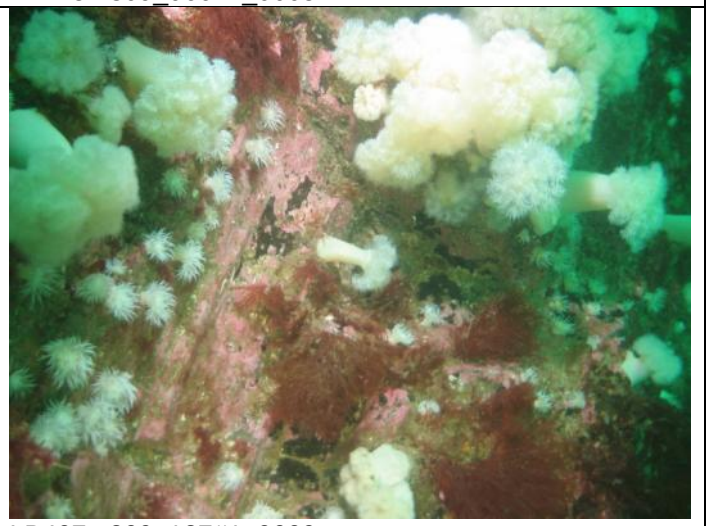
Line name	LB604	LB409	LB116	LB116	LB118
Sample number	309_157#01	309_158#01	309_159#01	309_159#1	309_160#01
Section	1	1	1	2	1
Biotope	SS.SMx.CMx.FluHyd	SS.SCS.CCS	SS.SMp.Mrl.Pcal	SS.SMp.Mrl .(Lgla)	SS.SCS.CCS
Substrata	sG sh	sG sh	sG sh	sG sh	sG sh
HYDROZOA	R	R		R	R
Nemertesia sp.		O			
Actiniaria		O	O		O
Urticina sp.		O			O
POLYCHAETA burrow		O			
Spirobranchus sp.	O	O			
BALANOMORPHA	R				
Paguridae		O	O	O	O
Atelecyclus rotundatus					R
Liocarcinus depurator			O		
Pectinidae			O		
BRYOZOA	R				
Alcyonidium diaphanum	C	O			
Flustra foliacea	C			R	R
ASTEROIDEA			O		
Crossaster papposus				C	F
Asterias rubens	O	F	F	F	O
Echinus esculentus		F	C	F	O
RHODOPHYCOTA encrust.		R			R
Lithothamnion glaciale			R	O	
Phytomatolithon calcareum live			F		
Phytomatolithon calcareum dead			C	R	

Line name	LB115	LB119	LB120	LB121	LB122
Sample number	309_161#01	309_162#01	309_163#01	309_164#01	309_165#01
Section	1	1	1	1	1
Biotope	SS.SMp.Mrl .Pcal	SS.SMp.Mrl .Pcal	SS.SMp.Mrl .Pcal	SS.SMp.Mrl .Pcal	SS.SMp.Mrl .(Pcal)
Substrata	sG sh	sG sh	sG sh	sG sh	sG sh
HYDROZOA	R	R	R	R	R
Nemertesia sp.	O				O
Actiniaria	O	O	O	O	O
POLYCHAETA burrow			R		
Paguridae	O	O	O		
BRACHYURA			O		
Pectinidae					O
BRYOZOA				R	O
Alcyonidium diaphanum					F
Flustra foliacea		R	R		R
ASTEROIDEA	O	O			
Crossaster papposus	O			F	F
Asterias rubens	F	F	F	F	O
Echinus esculentus	O	O	O		
TELEOSTEI	O				
RHODOPHYCOTA foliose					R
Phytomatolithon calcareum live	F	F	O	O	R
Phytomatolithon calcareum dead	C	A	A	C	R

Line name	LB117	LB416	LB508	LB509	LB519
Sample number	309_166#01	309_167#01	309_168#01	309_169#01	309_170#01
Section	1	1	1	1	1
Biotope	SS.SMp.Mrl. (Lgla)	CR.MCR.EcCr. FaAlCr.Bri	IR.MIR.KR. LhypTX	IR.MIR.KR. Ldig.Pid	IR.HIR.KFaR.FoR
Substrata	sG sh	sG sh	sG	G R	G R
PORIFERA encrust.					R
Esperiopsis fucorum					C
HYDROZOA	R		R		O
Nemertesia sp.					O
Obelia genicuata			R		
Alcyonium digitatum		R			R
Actiniaria	O	O			
Urticina sp.	O				
Chaetopterus tube	O				
BALANOMORPHA			O	R	O
DECAPODA	O				
Homarus gammarus			F		
Paguridae	O				
BRACHYURA	O				
Cancer pagurus			F		O
GASTROPODA			O	O	
Pectinidae		O			
Pholas dactylus bored holes				O	
BRYOZOA	R		R		
Membraniporidae			O	R	
Flustra foliacea	O				R
Luidia ciliaris		O			
Crossaster papposus			F		
Asterias rubens	O		O	O	O
Ophiothrix fragilis		A			
Ophiocomina nigra		C			
Echinus esculentus	F	C			
ASCIDIACEA colonial			R	R	R
TELEOSTEI					O
Labridae					O
RHODOPHYCOTA foliose			A	O	C
RHODOPHYCOTA encrust.		O	R	R	R
Lithothamnion glaciale	F				
Phytomatolithon calcareum dead	R				
Dilsea carnosa			O	R	R
CHROMOPHYCOTA foliose			F	O	R
Laminaria digitata				F	
Laminaria hyperborea			A		
Saccharina latissima			O	R	

Line name	LB519	LB520	LB521	LB521	LB521
Sample number	309_170#02	309_171#01	309_172#01	309_172#01	309_172#01
Section	1	1	1	2	3
Biotope	IR.HIR.KFaR.FoR	IR.HIR.KSed. XKScrR	CR.HCR.XFa. FluCoAs.SmAs	SS.SCS.CCS	CR.HCR.XFa. FluCoAs.SmAs
Substrata	G R	G R	S R	sG	S R
PORIFERA encrust.	R		R		
Esperiopsis fucorum	O				R
HYDROZOA	R	R	F	R	F
Nemertesia sp.			O		
Obelia genicuata	R	R			
Alcyonium digitatum			R		O
Actiniaria			O		O
Urticina sp.			F	O	O
BALANOMORPHA	O	O			
Hyas araneus			O		
Cancer pagurus	O				
Necora puber			O		
GASTROPODA		O			
Alcyonidium diaphanum	R		O	F	O
Membraniporidae		R			
Flustra foliacea			C	O	A
ASTEROIDEA		O			
Crossaster papposus				O	
Asterias rubens			O		
ASCIDIACEA colonial	R				
Dendrodoa grossularia	R				
Labridae	F	O			
Ctenolabrus rupestris	F				
RHODOPHYCOTA foliose	C	C	R		R
RHODOPHYCOTA encrust.	R	R			
Dilsea carnosa	O	O			
Delesseria sanguinea	R	R			
CHROMOPHYCOTA foliose	R	R			
Laminaria digitata		F			
Laminaria hyperborea		F			
Saccharina latissima		R			
Halidrys siliquosa	O				

APPENDIX E. VIDEO SURVEY BIOTOPE INVENTORY

Biotope	Stations Where Present	Description	Example Image(s)
CR.HCR.FaT.(CTub)	LB425	Very tide-swept faunal communities with small clumps of *Tubularia indivisa.*	 LB425. 309_066#1_0005
CR.HCR.FaT.MsenAct	LB407	Proposed new biotope – *Metridium senile and Actinothoe sphyrodeta* on vertical circalittoral rock. High densities of both anemones rarely encountered together in other biotopes; some foliose and encrusting red algae	 LB407. 309_137#1_0009

Biotope	Stations Where Present	Description	Example Image(s)
CR.HCR.XFa	LB302; LB412; LB413; LB414; LB419	Mixed faunal turf communities	 LB414. 309_133#1_0007
CR.HCR.XFa.(ByErSp)	LB610	Mixed faunal turf communities, with some characteristic bryozoans but lacking erect sponge component of full biotope.	 LB610. 309_143#1_0005

Biotope	Stations Where Present	Description	Example Image(s)
CR.HCR.XFa.(FluCoAs.X)	LB402	Mixed faunal turf communities, including some *Flustra foliacea,* on tide-swept exposed circalittoral mixed substrata.	 LB402. 309_153#1_0009
CR.HCR.XFa.ByErSp	LB301	Bryozoan turf and erect sponges on tide-swept circalittoral rock	 LB301. 309_063#1_002

Biotope	Stations Where Present	Description	Example Image(s)
CR.HCR.XFa.ByErSp.DysAct	LB401; LB420	Mixed turf of bryozoans and erect sponges with *Dysidea fragilis* and *Actinothoe sphyrodeta* on tide-swept, wave-exposed circalittoral rock	 LB401. 309_140#1_0003
CR.HCR.XFa.FluCoAs.SmAs	LB521	*Flustra foliacea*, small solitary and colonial ascidians (*Molgula* sp.) on tide-swept circalittoral bedrock or boulders;	 LB521. 309_172#1_0002

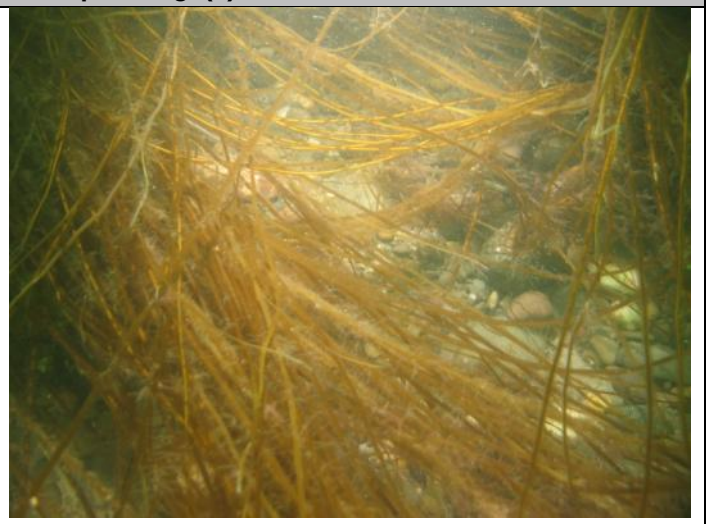
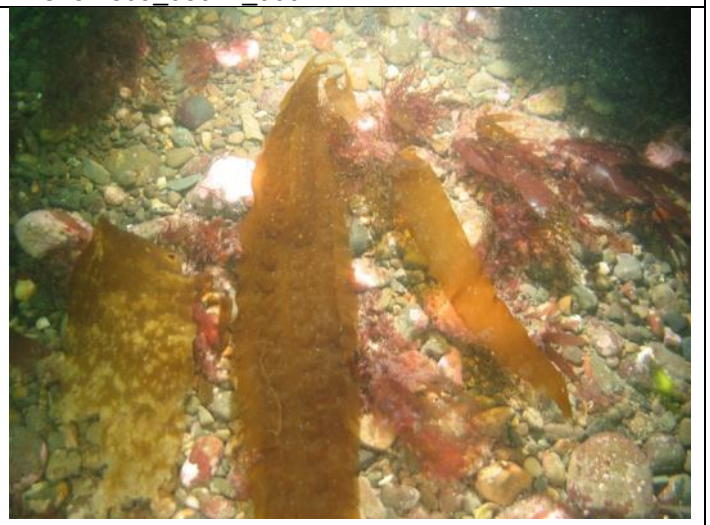
Biotope	Stations Where Present	Description	Example Image(s)
CR.HCR.XFa.SpNemAdia	LB404	Sparse sponges, *Nemertesia* spp., and *Alcyonidium diaphanum* on circalittoral mixed substrata.	 LB404. 309_141#1_0004
CR.MCR.EcCr.FaAlCr	LB308; LB421; LB423; LB424	Faunal and algal crusts on exposed to moderately wave exposed circalittoral rock.	 LB308. 309_128#1_0003

Biotope	Stations Where Present	Description	Example Image(s)
CR.MCR.EcCr.FaAlCr.(Adig)	LB408	Faunal and algal crusts on exposed to moderately wave exposed circalittoral rock, with some *Alcyonium digitatum.*	 LB408. 309_136#1_0007
CR.MCR.EcCr.FaAlCr.Bri	LB416	Brittlestar bed on faunal and algal encrusted, exposed to moderately wave-exposed circalittoral rock; *Ophiothrix fragilis* and *Ophiocomina nigra* present	 LB416. 309_167#1_0002

Biotope	Stations Where Present	Description	Example Image(s)
CR.MCR.EcCr.FaAlCr.Flu	LB403	*Flustra foliacea* on slightly scoured silty circalittoral rock.	 LB403. 309_124#1_0006
CR.MCR.EcCr.(UrtScr)	LB410	Echinoderms and crustose red algae, with some *Urticina felina*	 LB410. 309_142#1_0008

Biotope	Stations Where Present	Description	Example Image(s)
CR.MCR.EcCr.UrtScr	LB422	*Urticina felina* and sand-tolerant fauna on sand-scoured or covered circalittoral rock.	 LB422. 309_122#1_0010
IR.HIR.KFaR.FoR	LB513; LB519	Foliose red seaweeds on exposed lower infralittoral rock. With *Esperiopsis fucorum* and *Dendrodoa.*	 LB519. 309_170#1_0002

Biotope	Stations Where Present	Description	Example Image(s)
IR.HIR.KSed	LB214; LB215; LB304; LB305; LB311; LB318; LB511; LB514; LB518	Sand or gravel-affected or disturbed kelp and seaweed communities. Red algae identification difficult from video and still images, so hard to place stations into sub-biotopes with a high degree of confidence.	 LB518. 309_117#2_0005
IR.HIR.KSed.(DesFilR)	LB310; LB312	Sand or gravel-affected or disturbed kelp and seaweed communities, with some *Desmarestia* spp.	 LB312. 309_077#1_0007

Biotope	Stations Where Present	Description	Example Image(s)
IR.HIR.KSed.(LsacChoR)	LB313; LB315	Sand or gravel-affected or disturbed kelp and seaweed communities, with some *Chorda filum*	 LB315. 309_050#1_0002
IR.HIR.KSed.(XKScrR)	LB307	Sand or gravel-affected or disturbed kelp and seaweed communities, with some scour resistant red algae species.	 LB307. 309_061#1_0009

Biotope	Stations Where Present	Description	Example Image(s)
IR.HIR.KSed.XKScrR	LB407; LB520	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock.	 LB520. 309_171#1_0009
IR.HIR.KSed.LsacSac	LB303	*Laminaria saccharina* and/or *Saccorhiza polyschides* on exposed infralittoral rock	 LB303. 309_127#1_0002

Biotope	Stations Where Present	Description	Example Image(s)
IR.MIR.KR.Ldig.Pid	LB509	*Laminaria digitata* and piddocks on sublittoral fringe soft rock. Piddock bored soft rock with a gravel covering; kelp and red algae present on cobbles.	 LB509. 309_169#1_0007
IR.MIR.KR.LhypTX	LB508; LB309; LB406	*Laminaria hyperborea* on tide-swept, infralittoral mixed substrata. Kelp frond colonised by *Obelia*.	 LB406. 309_138#1_0007

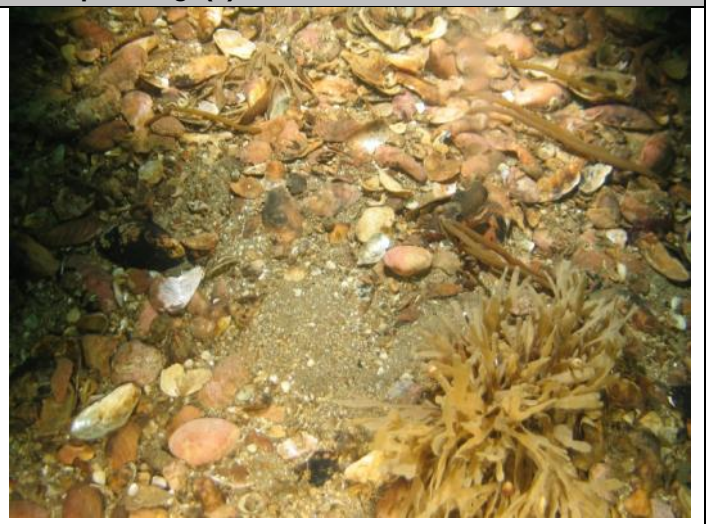
Biotope	Stations Where Present	Description	Example Image(s)
SS.SCS.CCS	LB001; LB002; LB003; LB101; LB102; LB103; LB104; LB105; LB106; LB107; LB108; LB110; LB113; LB118; LB302; LB320; LB404; LB407; LB409; LB410; LB415; LB418; LB517; LB521; LB602; LB603; LB605; LB606; LB607; LB608	Circalittoral coarse sediment; either coarse sands or gravel and shell beds.	 LB605. 309_156#1_0008  LB602. 309_147#1_0013

Biotope	Stations Where Present	Description	Example Image(s)
SS.SCS.ICS	LB004; LB005; LB006; LB211; LB513	Infralittoral coarse sediment; either sand or gravel beds.	 LB004. 309_047#1_0007
SS.SCS.ICS.SSh	LB306	Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles), with little obvious fauna.	 LB306. 309_081#1_0002

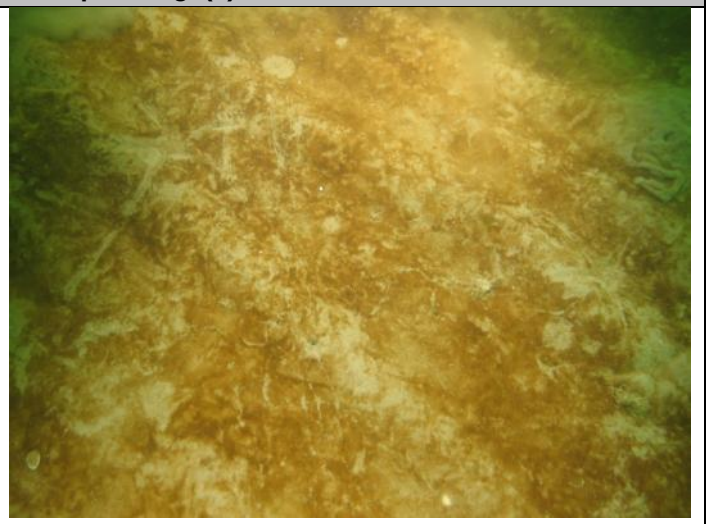
Biotope	Stations Where Present	Description	Example Image(s)
SS.SMp.KSwSS.LsacR	LB314	*Laminaria saccharina* and red seaweeds on infralittoral sediments. *Laminaria* is sparse, with dense stands of various red algae. Few large cobbles / pebbles present.	 LB314. 309_076#1_0002
SS.SMp.Mrl.(Lgla)	LB116; LB117	Encrusting *Lithothamnion glaciale* maerl beds. No rhodoliths present. More *L. glaciale* present than *Phymatolithon calcareum.*	 LB117. 309_166#1_0004

Biotope	Stations Where Present	Description	Example Image(s)
SS.SMp.Mrl.(Pcal)	LB122	Coarse gravel, with a small component of dead *Phymatolithon calcareum.* Designated as .(Pcal) to reflect the maerl present.	 LB122. 309_165#1_0009
SS.SMp.Mrl.Pcal	LB109; LB111; LB112; LB114; LB115; LB116; LB119; LB120; LB121	*Phymatolithon calcareum* maerl beds in infralittoral clean gravel or coarse sand. Mobile echinoderms such as *Asterias rubens* and *Echinus esculentus*. Bands of dead bivalve shells present.	 LB111. 309_090#01_0004

Biotope	Stations Where Present	Description	Example Image(s)
SS.SMx.CMx	LB010; LB011; LB012; LB202	Circalittoral mixed sediment. *Alcyonidium diaphanum* and *Cerianthus lloydii* present.	 LB010. 309_115#1_0004
SS.SMx.CMx.(FluHyd)	LB601	Transition between SS.SCS.CCS and SS.SMX.CMx.FluHyd. Fauna characteristic of FluHyd only sparsely present on coarse gravel and shell material.	 LB601.309_154#1_0015

Biotope	Stations Where Present	Description	Example Image(s)
SS.SMx.CMx.FluHyd	LB405; LB411; LB417; LB604; LB609	*Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment.	 LB604. 309_157#1_0010
SS.SMx.IMx	LB201; LB203; LB204; LB206; LB207; LB209; LB210; LB211; LB212; LB213; LB316; LB317	Infralittoral mixed sediments. Similar to SS.SSA.CMuSa, but a higher degree of gravel and shell debris present.	 LB201. 309_083#1_0006

Biotope	Stations Where Present	Description	Example Image(s)
SS.SSa.CMuSa	LB007; LB008; LB009; LB013; LB014; LB015; LB021; LB208; LB319; LB515; LB516; LB517	Circalittoral muddy sand, with some infaunal burrows and common *Ophiura* brittlestars.	 LB007. 309_096#1_003
SS.SSa.IFiSa.(ScupHyd)	LB022	Infralittoral fine sand. Sparse pebbles / cobbles with *Flustra foliacea* and *Alcyonidium diaphanum*. *Urticina felina* also present.	 LB022. 309_074#1_0004

Biotope	Stations Where Present	Description	Example Image(s)
SS.SSa.IMuSa	LB016; LB017; LB018; LB019; LB020; LB205; LB510; LB512	Infralittoral muddy sand. High amounts of surface organic matter. Infaunal burrows, feeding tracks and faecal mounds visible.	 LB020. 309_102#1_0005

APPENDIX F. VIDEO SURVEY SPECIES LIST

MCS alpha and # according to Howson & Picton (1997)
Species nomenclature as per WoRMS (WoRMS editorial board, 2014)

MCS alpha	MCS num	Taxa	Qualifier
C	1	**PORIFERA**	encrusting sp.
C	1	**PORIFERA**	erect / massive sp.
C	91	*Leucandra gossei*	
C	233	*Pachymatisma johnstonia*	
C	354	*Polymastia*	sp.
C	414	*Suberites*	sp.
C	480	*Cliona celata*	boring form
C	651	*Halichondria panicea*	
C	726	*Mycale macilenta*	
C	758	*Esperiopsis fucorum*	
C	984	*Hemimycale columella*	
C	1315	*Raspailia*	sp.
C	1321	*Raspailia hispida*	
C	1422	*Haliclona cinerea*	
C	1670	*Dysidea fragilis*	
D	11	*Haliclystus auricula*	
D	58	**HYDROZOA**	sp.
D	166	*Tubularia indivisa*	
D	273	*Hydractinia echinata*	
D	390	*Halecium*	sp.
D	409	*Abietinaria abietina*	
D	424	*Hydrallmania falcata*	
D	462	*Nemertesia*	sp.
D	463	*Nemertesia antennina*	
D	466	*Nemertesia ramosa*	
D	517	*Obelia*	sp.
D	520	*Obelia geniculata*	
D	597	*Alcyonium digitatum*	
D	632	*Cerianthus lloydii*	
D	649	*Epizoanthus couchii*	
D	662	**ACTINIARIA**	sp.
D	682	*Urticina*	sp.
D	684	*Urticina felina*	
D	710	*Metridium senile*	
D	711	Sagartiidae	sp.
D	712	*Sagartia*	sp.
D	713	*Sagartia elegans*	
D	717	*Cereus pedunculatus*	

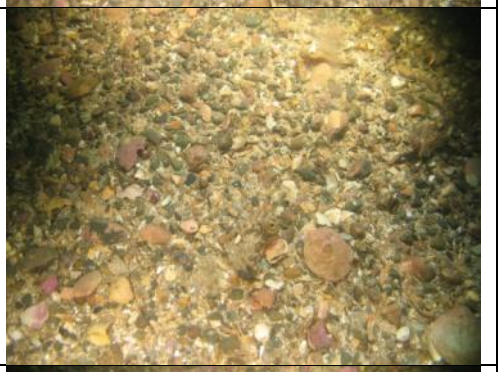
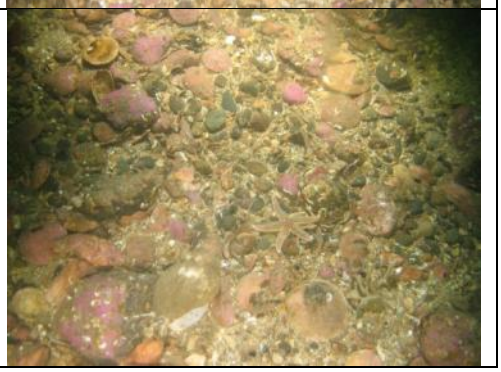
MCS alpha	MCS num	Taxa	Qualifier
D	719	*Actinothoe sphyrodeta*	
D	783	*Caryophyllia smithii*	
P	2	**POLYCHAETA**	faecal casts
P	2	**POLYCHAETA**	vertical burrows
P	2	**POLYCHAETA**	tube
P	811	*Chaetopterus*	tube
P	931	*Arenicola marina*	faecal casts
P	1179	Terebellidae	sp. feeding tentacles
P	1195	*Lanice conchilega*	
P	1257	Sabellidae	sp.
P	1320	*Sabella pavonina*	
P	1324	Serpulidae	sp.
P	1339	*Spirobranchus*	sp.
P	1391	*Spirorbis*	sp.
R	42	BALANOMORPHA	sp.
S	1276	DECAPODA	sp.
S	1293	CARIDEA	sp.
S	1400	*Homarus gammarus*	
S	1445	Paguridae	sp.
S	1457	*Pagurus bernhardus*	
S	1469	Galatheidae	sp.
S	1485	BRACHYURA	sp.
S	1504	*Ebalia*	sp.
S	1512	Majidae	sp.
S	1515	*Maja squinado*	
S	1518	*Hyas araneus*	
S	1555	*Atelecyclus rotundatus*	
S	1566	*Cancer pagurus*	
S	1577	*Liocarcinus*	sp.
S	1580	*Liocarcinus depurator*	
S	1589	*Necora puber*	
S	1594	*Carcinus maenas*	
W	1	**MOLLUSCA**	sp.
W	46	POLYPLACOPHORA	sp.
W	88	GASTROPODA	sp.
W	163	*Gibbula cineraria*	
W	165	*Gibbula umbilicalis*	
W	182	*Calliostoma zizyphinum*	
W	227	*Patella*	sp.
W	493	*Euspira catena*	
W	702	Buccinidae	sp.
W	708	*Buccinum undatum*	
W	745	*Hinia reticulata*	

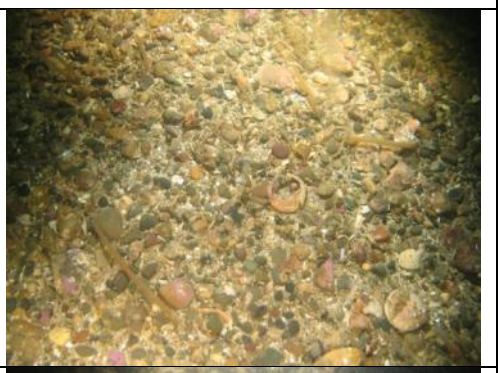
MCS alpha	MCS num	Taxa	Qualifier
W	1019	*Scaphander lignarius*	
W	1038	*Philine aperta*	
W	1243	NUDIBRANCHIA	sp.
W	1243	NUDIBRANCHIA	sp. egg mass
W	1246	*Tritonia*	sp.
W	1319	Onchidoridídae	sp.
W	1407	*Janolus cristatus*	
W	1450	*Eubranchus tricolor*	
W	1560	BIVALVIA	sp.
W	1560	BIVALVIA	sp. siphon
W	1768	Pectinidae	sp.
W	1771	*Pecten maximus*	
W	1774	*Chlamys*	sp.
W	1991	Solenidae	sp.
W	2178	*Pholas dactylus*	bored holes
Y	1	**BRYOZOA**	sp.
Y	13	*Crisia*	sp.
Y	76	*Alcyonidium diaphanum*	
Y	131	*Vesicularia spinosa*	
Y	165	*Eucratea loricata*	
Y	167	Membraniporidae	sp.
Y	187	*Flustra foliacea*	
Y	240	*Bugula*	sp.
Y	246	*Bugula plumosa*	
Y	300	*Cellaria fistulosa*	
ZB	9	*Antedon*	sp.
ZB	18	ASTEROIDEA	juv.
ZB	21	*Luidia*	sp.
ZB	22	*Luidia ciliaris*	
ZB	75	*Crossaster papposus*	juv.
ZB	75	*Crossaster papposus*	
ZB	82	*Henricia*	sp.
ZB	100	*Asterias rubens*	
ZB	102	*Leptasterias muelleri*	
ZB	104	*Marthasterias glacialis*	
ZB	108	OPHIUROIDEA	sp.
ZB	124	*Ophiothrix fragilis*	
ZB	128	*Ophiocomina nigra*	
ZB	166	*Ophiura*	sp.
ZB	168	*Ophiura albida*	
ZB	170	*Ophiura ophiura*	
ZB	181	**ECHINOIDEA**	sp.
ZB	193	*Psammechinus miliaris*	

MCS alpha	MCS num	Taxa	Qualifier
ZB	198	*Echinus esculentus*	
ZB	249	DENDROCHIROTIDA	sp. (?)
ZD	2	**ASCIDIACEA**	sp.
ZD	2	**ASCIDIACEA**	sp. colonial
ZD	7	*Clavelina lepadiformis*	
ZD	29	*Sidnyum*	sp.
ZD	59	*Diplosoma listerianum*	
ZD	65	*Lissoclinum perforatum*	
ZD	72	*Ciona intestinalis*	
ZD	81	*Corella parallelogramma*	
ZD	82	Ascidiidae	sp.
ZD	84	*Ascidiella aspersa*	
ZD	120	*Dendrodoa grossularia*	
ZD	124	*Botryllus schlosseri*	
ZD	138	*Pyura*	sp.
ZD	146	*Molgula*	sp.
ZG	7	**TELEOSTEI**	sp.
ZG	283	*Taurulus bubalis*	
ZG	291	*Agonus cataphractus*	
ZG	386	Labridae	sp.
ZG	397	*Ctenolabrus rupestris*	
ZG	406	Blenniidae	sp.
ZG	452	*Callionymus lyra*	
ZG	455	Gobiidae	sp.
ZG	470	*Gobiusculus flavescens*	
ZG	545	PLEURONECTIFORMES	sp.
ZM	1	**RHODOPHYCOTA**	encrusting sp.
ZM	1	**RHODOPHYCOTA**	foliose sp.
ZM	186	*Ahnfeltia plicata*	
ZM	237	*Lithothamnion glaciale*	
ZM	255	*Phymatolithon calcareum*	dead
ZM	255	*Phymatolithon calcareum*	live
ZM	318	*Calliblepharis*	sp.
ZM	319	*Calliblepharis ciliata*	
ZM	328	*Dilsea carnosa*	
ZM	345	*Chondrus crispus*	
ZM	581	*Heterosiphonia plumosa*	
ZM	594	*Delesseria sanguinea*	
ZM	616	*Phycodrys rubens*	
ZM	407	*Phyllophora crispa*	
ZR	1	**CHROMOPHYCOTA**	sp.
ZR	313	*Dictyota dichotoma*	
ZR	325	*Carpomitra costata*	

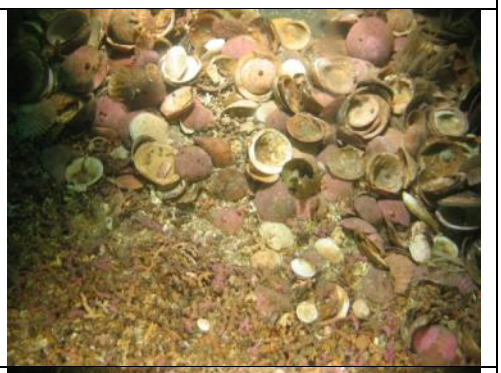
MCS alpha	MCS num	Taxa	Qualifier
ZR	333	*Desmarestia*	sp.
ZR	346	*Chorda filum*	
ZR	349	*Laminaria*	sp.
ZR	350	*Laminaria digitata*	
ZR	351	*Laminaria hyperborea*	
ZR	354	*Saccharina latissima*	
ZR	359	*Saccorhiza polyschides*	
ZR	372	*Halidrys siliquosa*	
ZR	382	*Fucus serratus*	
ZR	389	*Himanthalia elongata*	
ZS	1	**CHLOROPHYCOTA**	foliose sp.

APPENDIX G. VIDEO SURVEY DESCRIPTION OF ALL STATIONS

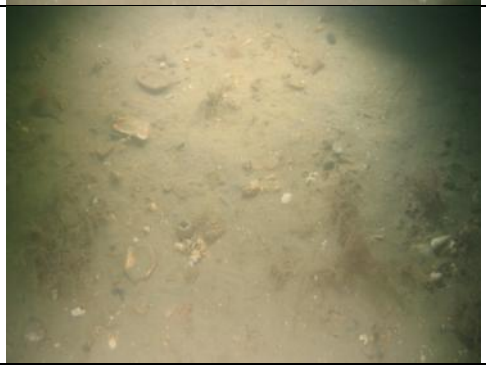
Station	Biotopes	Description	Example Images
LB101	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. Odd clumps of *Flustra*, some *Urticina, Lanice* and *Echinus* present. Verging on CMx.FluHyd biotope.	
LB102	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. Odd clumps of *Flustra*, some *Urticina, Lanice* and *Echinus* present. Verging on CMx.FluHyd biotope.	
LB103	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. *Crossaster* and *Echinus* present, with red encrusting algae on some gravel.	
LB104	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. Large echinoderms (e.g. *Asterias, Echinus*) present, with red encrusting algae on some gravel.	

Station	Biotopes	Description	Example Images
LB105	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. Large echinoderms (e.g. *Asterias, Echinus*) present, with clumps of *Flustra* and *Alcyonidium*. Verging on FluHyd.	
LB106	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. Large echinoderms (e.g. *Asterias, Echinus*) present, with red encrusting algae on some gravel. Verging on FluHyd.	
LB107	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material, incl. dead *Modiolus* shells. Some hydroids and *Alcyonidium* present.	
LB108	SS.SCS.CCS	Coarse sediment composed of gravel and some shell material. Large echinoderms (e.g. *Asterias, Echinus*) present, with red encrusting algae on some gravel.	
LB109	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	

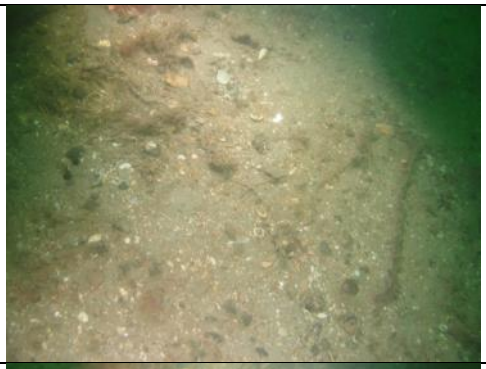
Station	Biotopes	Description	Example Images
LB110	SS.SCS.CCS	Gravel with some shell material. Large echinoderms (e.g. *Asterias, Echinus*), *Alcyonidium* and hydroids present.	
LB111	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	
LB112	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	
LB113	SS.SCS.CCS	Gravel with some shell material. Some large mobile fauna present	
LB114	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	

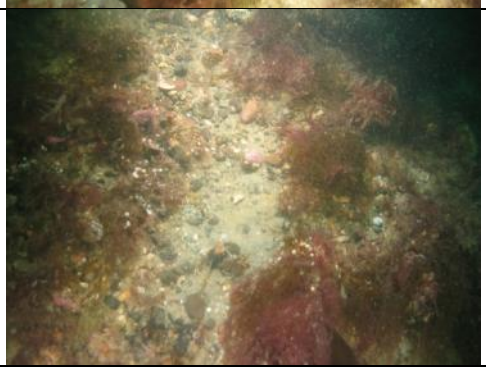
Station	Biotopes	Description	Example Images
LB115	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells (see example image). Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	
LB116	SS.SMp.Mrl.Pcal (Top image) SS.SMp.Mrl(.Lgla) (Bottom image)	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Towards end of line amount of *P. calcareum* drops, and *Lithothamnion glaciale* can be found encrusted on pebbles. Large mobile echinoderms (e.g. *Asterias, Echinus*), hydroids and bryozoans present.	 
LB117	SS.SMp.Mrl.(Lgla)	Small amount of dead *Phymatolithon calcareum* gravel with *Lithothamnion glaciale* encrusted on pebbles. Shell debris throughout the line.	
LB118	SS.SCS.CCS	Gravel with some shell material. Large echinoderms (e.g. *Asterias, Echinus*), *Alcyonidium* and hydroids present.	

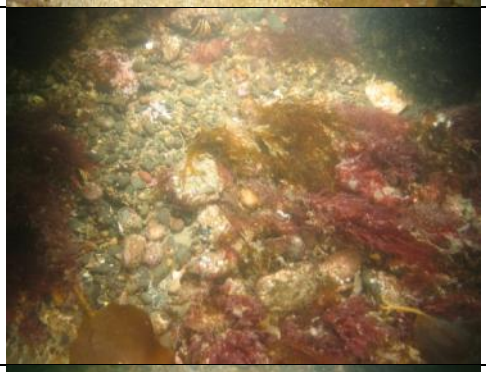
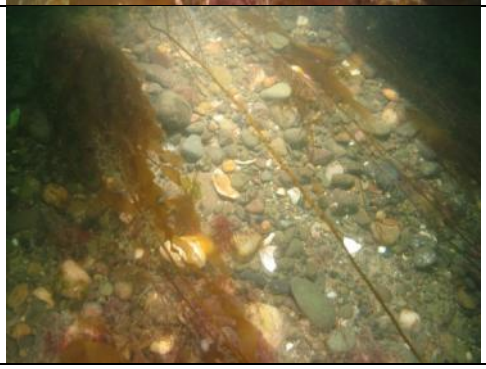
Station	Biotopes	Description	Example Images
LB119	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	
LB120	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	
LB121	SS.SMp.Mrl.Pcal	Live and dead *Phymatolithon calcareum* gravel with bands of dead bivalve shells. Large mobile echinoderms (e.g. *Asterias, Echinus*) present.	
LB122	SS.SMp.Mrl.(Pcal)	Small amount of mostly dead *Phymatolithon calcareum* gravel, with some coarse gravel, sand and shell material. *Asterias rubens* and *Alcyonidium diaphanum* present.	
LB201	SS.SMx.IMx	Silt and sand with broken shell material and some gravel. Hydroids, bryozoans, scallops and Serpulidae tubes present.	

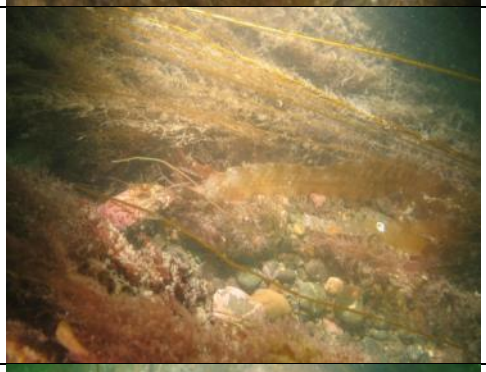
Station	Biotopes	Description	Example Images
LB202	SS.SMx.CMx	Silt and sand with lots of broken shell material and some gravel. Sparse hydroids, *Ophiura albida* and Serpulidae tubes present.	
LB203	SS.SMx.IMx	Silt and sand with broken shell material and some gravel. Hydroids, bryozoans, and Paguridae present.	
LB204	SS.SMx.IMx	Gravel with some soft sediment and broken shell material. Hydroids, bryozoans, and *Asterias* present.	
LB205	SS.SSa.IMuSa	Muddy sand waves, with some infaunal burrows visible. Ophiuroids present. Beginning to verge on SS.SMx.IMx biotope	
LB206	SS.SMx.IMx	Muddy sand with dead shells and sparse gravel. Small clumps of algal and hydroids. Transition between IMuSa and IMx biotopes	

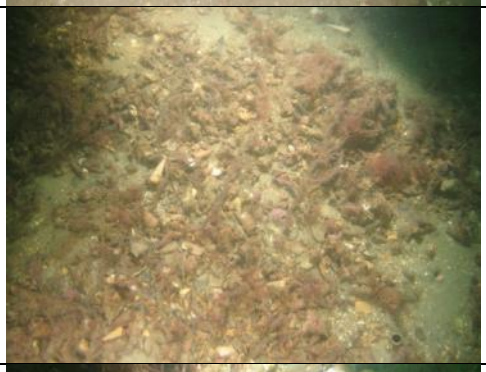
Station	Biotopes	Description	Example Images
LB207	SS.SMx.IMx	Broken shell material with silt and sand, some sand waves. Infaunal burrows, ophiuroids, hydroid and bryozoan clumps. Transition between IMuSa and IMx biotopes	
LB208	SS.SSa.CMuSa	Muddy sand waves with infaunal burrows, *Alcyonidium diaphanum* and ophiuroids.	
LB209	SS.SMx.IMx	Broken shell with silt and sand, some sand waves. Infaunal burrows, ophiuroids, Paguridae, hydroid and bryozoan clumps. Transition between IMuSa IMx	
LB210	SS.SMx.IMx	Gravel with muddy sand and shell fragments. Small clumps of algae and hydroids on shells / pebbles	
LB211	SS.SMx.IMx SS.SCS.ICS (see image)	Gravel with muddy sand and shell fragments at start of line, changing into coarse sand with some shell material. Clumps of algae and hydroids gradually decrease in frequency as biotopes change.	

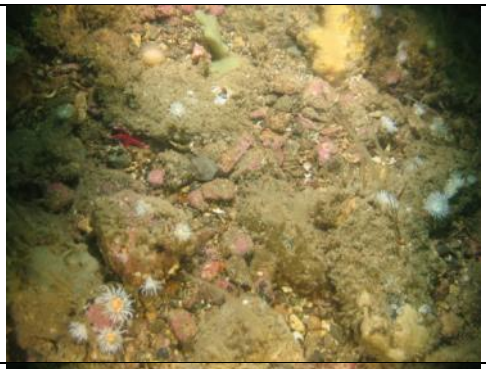
Station	Biotopes	Description	Example Images
LB212	SS.SMx.IMx	Gravel with some soft sediment and broken shell material. Hydroids, *Alcyonidium diaphanum* and ophiuroids present.	
LB213	SS.SMx.IMx	Gravel with muddy sand and shell fragments. Small algal clumps on shells / pebbles.	
LB214	IR.HIR.KSed	Kelp and various red algae on cobbles and boulders, interspaced by sandy gravel patches. Some *Chorda filum* present	
LB215	IR.HIR.KSed	Various red and brown algae on cobbles and boulders, interspaced by sandy gravel patches.	
LB301	CR.HCR.XFa.ByErSp	Faunal turf comprised of a variety of hydroids, sponge and bryozoans on rock. Other species included *Actinothoe sphyrodeta, Crossaster* and *Asterias*	

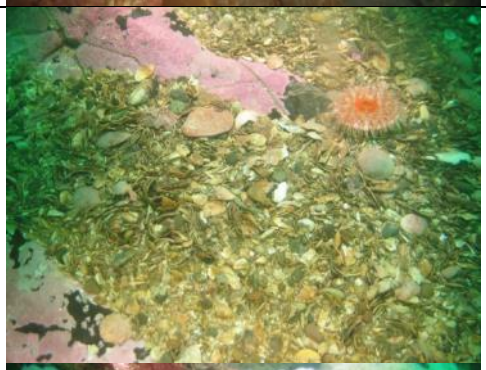
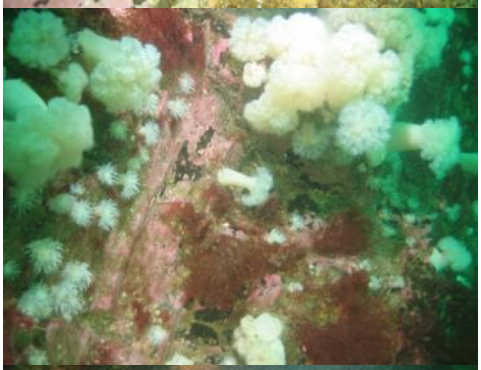
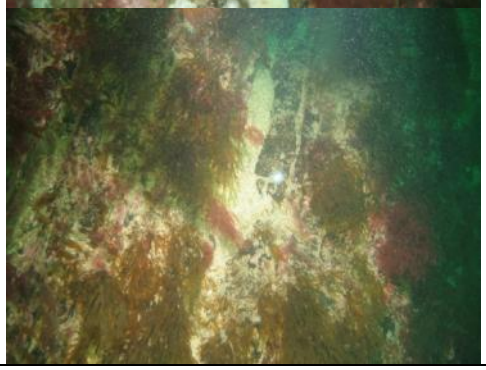
Station	Biotopes	Description	Example Images
LB302	SS.SCS.CCS (top image) CR.HCR.XFa (bottom image)	Coarse gravel and shell material with dead *Modiolus modiolus* shells at SOL, with larger boulders / cobbles colonised by sponges, hydroids and bryozoans towards EOL. SS.SCS.CCS section faunally sparse. CR.HCR.XFa section with faunal turf, *Crossaster, Asterias, Actinothoe* and other anemones.	 
LB303	IR.HIR.KSed.LsacSac	Red and brown algae with kelp on cobbles and rock, interspaced by areas of sandy gravel.	
LB304	IR.HIR.KSed	Red algae on cobbles and rock. Some barnacles, *Dendrodoa*, and *Esperiopsis fucorum* present, with colonial ascidians on algae.	
LB305	IR.HIR.KSed	Red and brown algae on cobbles and rock, interspaced by muddy sand. *Dendrodoa* present, with colonial ascidians on algae.	

Station	Biotopes	Description	Example Images
LB306	SS.SCS.ICS.SSh	Coarse sediment and dead shell material (incl. some *Modiolus modiolus* shells).	
LB307	IR.HIR.KSed(.XKScrR)	Various red and brown algae with kelp on rocks and gravel.	
LB308	CR.MCR.EcCr.FaAlCr	Cobbles and boulders with encrusting red algae interspaced with coarse sand. Bryozoans, hydroids and *Echinus* present.	
LB309	IR.MIR.KR.LhypTX	Red and brown algae with kelp in cobbles interspaced with gravel. Barnacles, colonial ascidians on algae and *Asterias* present.	
LB310	IR.HIR.KSed(.DesFilR)	Kelp, red algae and sparse Chorda filum on coarse sediment. *Alcyonidium* present, some *Obelia* on the algae.	

Station	Biotopes	Description	Example Images
LB311	IR.HIR.KSed	Red and brown algae on pebbles and coarse sediment.	
LB312	IR.HIR.KSed(.DesFilR)	Kelp, red algae and sparse *Chorda filum* on coarse sediment. *Alcyonidium* present, some *Obelia* on the algae.	
LB313	IR.HIR.KSed(.LsacChoR)	Pebbles and gravel with red and brown algae, including *Chorda filum.* Some *Sabella pavonina* present.	
LB314	SS.SMp.KSwSS.LsacR	Clumps of red algae and hydroids on muddy sand, but lacking kelp component of biotope.	
LB315	IR.HIR.KSed(.LsacChoR)	Pebbles and gravel with red and brown algae, including *Chorda filum*. Some *Obelia* on the algae.	

Station	Biotopes	Description	Example Images
LB316	SS.SMx.IMx	Muddy sand with some gravel and shell debris. Ophiuroids and sparse clumps of hydroids present.	
LB317	SS.SMx.IMx	Large amounts of dead gastropod shells on muddy sand. Paguridae present, with some red algae, bryozoan and hydroid clumps.	
LB318	IR.HIR.KSed	Red and brown algae on pebbles and coarse sediment.	
LB319	SS.SSa.CMuSa	Muddy sand with some organic matter on the surface. Infaunal burrows and ophiuroids present. Occasional cobble with attached red algae and hydroids.	
LB320	SS.SCS.CCS	Coarse sand; faunally sparse.	

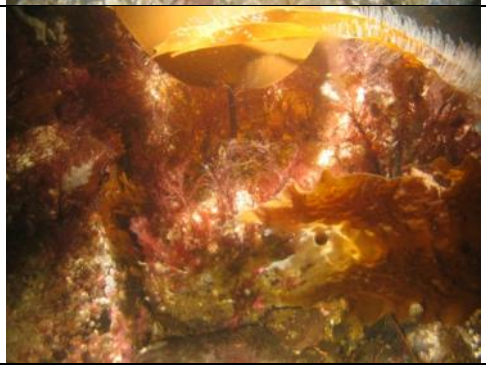
Station	Biotopes	Description	Example Images
LB401	CR.HCR.XFa.ByErSp.DysAct	Faunal turf with various sponges on rock and gravel. Large numbers of *Actinothoe sphyrodeta* present; some *Nemertesia* and anemones.	
LB402	CR.HCR.XFa.(FluCoAs.X)	Mixed sediment with faunal turf, including sponges, a variety of hydroids and *Flustra. Cerianthus lloydii* present.	
LB403	CR.MCR.EcCr.FaAlCr.Flu	Faunal turf and silt covered boulders interspaced with gravel. Various bryozoans incl. *Flustra Alcyonidium* present, with *Nemertesia* and *Crossaster*.	
LB404	CR.HCR.XFa.SpNemAdia (top image) SS.SCS.CCS (bottom image)	Large amounts of *Alcyonidium diaphanum* on sandy gravel and shell material. Other bryozoans and hydroids present. Faunal component reduces along transect, until absent towards end of line .	 

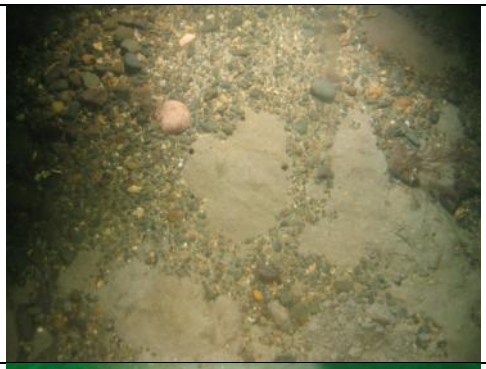
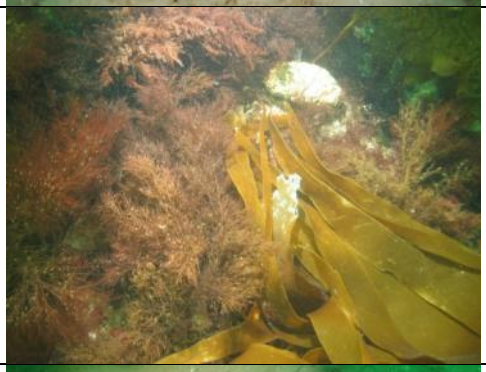
Station	Biotopes	Description	Example Images
LB405	SS.SMx.CMx.FluHyd	Gravel and broken shells with boulders. *Echinus* and anemones present. Lacks *Flustra* component of biotope, but fauna fits FluHyd rather than CCS.	
LB406	IR.MIR.KR.LhypTX	*Laminaria hyperborea* on tide-swept, infralittoral mixed substrata, with red algae and epiphytic *Obelia.*	
LB407	SS.SCS.CCS (top image) CR.HCR.FaT.MsenAct (proposed new biotope; middle image) IR.HIR.KSed.XKScrR (bottom image)	Coarse sediment and shell material at the base of a vertical rock face. Rock colonised by encrusting red algae, *Metridium* and *Actinothoe*, reaching shallower water with kelp, red and algae, before descending deeper again through the anemone zone to coarse sediment at the base.	  

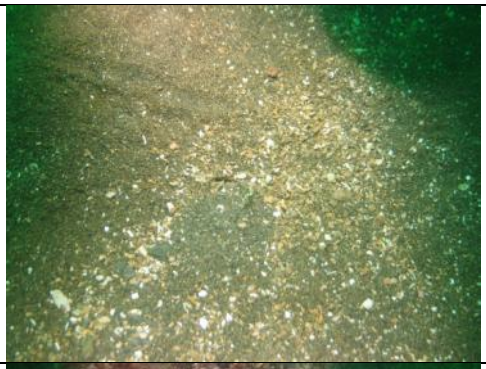
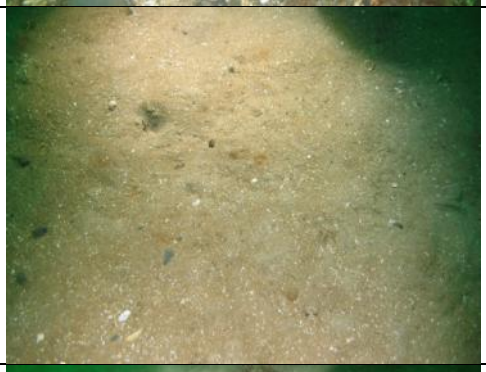
Station	Biotopes	Description	Example Images
LB408	CR.MCR.EcCr.FaAlCr.(Adig)	Gravel, pebbles and cobbles with faunal turf and some encrusting red algae. Some *Alcyonium digitatum* and *Crossaster* present.	
LB409	SS.SCS.CCS	Sandy gravel and shell material, with some hydroids and bryozoans.	
LB410	SS.SCS.CCS (top image) CR.MCR.EcCr.(UrtScr) (bottom image)	Sandy gravel and shell material, some *Alcyonidium*. Transitions into area with large cobbles / boulders with encrusting red algae, *Urticina* and *Echinus*.	 
LB411	SS.SMx.CMx.FluHyd	Gravel and shell material (incl. some *Modiolus modiolus* shells). Some *Flustra* and *Alcyonidium* present, odd *Urticina*.	

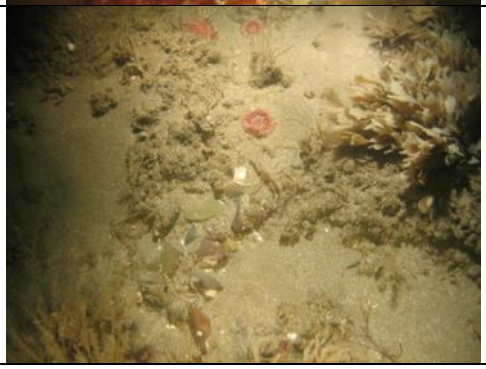
Station	Biotopes	Description	Example Images
LB412	CR.HCR.XFa	Sandy gravel with occasional large boulder / cobble. Clumps of *Flustra, Nemertesia; Urticina* and *Calliostoma* also present.	
LB413	CR.HCR.XFa	Gravel and shell material (incl. *Modiolus* shells). Some barnacle encrusted pebbles; *Urticina* and *Alcyonidium* present. Verging on CCS biotope.	
LB414	CR.HCR.XFa	Coarse gravel, pebbles and shell material, with *Flustra, Urticina, Crossaster* and some sponges.	
LB415	SS.SCS.CCS	Coarse gravel and shell material (incl. odd Modiolus shell). Some *Chaetopterus* tubes and bryozoan clumps present.	
LB416	CR.MCR.EcCr.FaAlCr.Bri	Red algae encrusted cobbles interspaced with coarse sand. *Ophiothrix fragilis* and *Ophiocomina nigra* occurring in high numbers.	

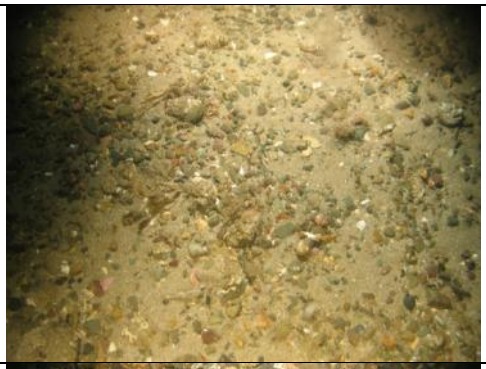
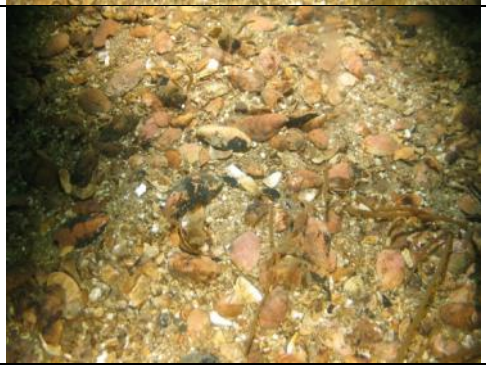
Station	Biotopes	Description	Example Images
LB417	SS.SMx.CMx.FluHyd	Pebbles and cobbles interspaced by coarse sand. *Flustra, Urticina, Echinus* and hydroids present.	
LB418	SS.SCS.CCS	Gravel and shell debris, including mussel shells. Some barnacle covered cobbles, and hydroid tufts present.	
LB419	CR.HCR.XFa	Gravel and pebbles, with shell debris (incl. mussels). *Urticina, Echinus, Necora* and *Asterias* present. Verging on CCS biotope.	
LB420	CR.HCR.XFa.ByErSp.DysAct	Faunal turf with various sponges on rock and gravel. Large numbers of *Actinothoe sphyrodeta* present; some *Nemertesia* and anemones, mobile macrofauna.	
LB421	CR.MCR.EcCr.FaAlCr	Red algae encrusted pebbles and cobbles. Some encrusting sponges, *Echinus* and anemones present.	

Station	Biotopes	Description	Example Images
LB422	CR.MCR.EcCr.UrtScr	Pebbles and cobbles with encrusting red algae, *Urticina* and *Echinus.*	
LB423	CR.MCR.EcCr.FaAlCr	Red algae encrusted pebbles and cobbles. Some encrusting sponges, hydroids, *Echinus* and anemones present.	
LB424	CR.MCR.EcCr.FaAlCr	Red algae encrusted pebbles and cobbles. Some encrusting sponges, *Tubularia, Echinus* and anemones present.	
LB425	CR.HCR.FaT.(CTub)	Coarse sediment and cobbles with faunal turf on hard substrata. Barnacles on some cobbles, with some hydroids and *Alcyonidium.*	
LB508	IR.MIR.KR.LhypTX	Pebbles and cobbles with kelp and an understory of red and brown algae. *Obelia* epiphytes on the kelp, *Cancer pagurus* present.	

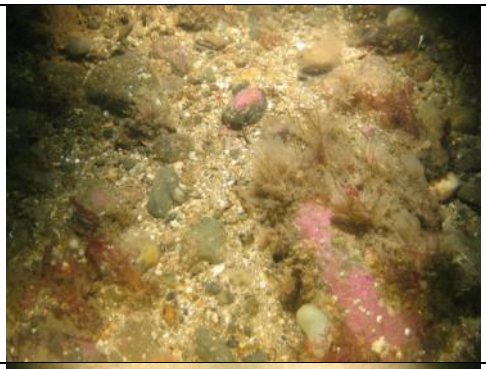
Station	Biotopes	Description	Example Images
LB509	IR.MIR.KR.Ldig.Pid	Patches of piddock bored soft rock overlaid by gravel and cobbles. Kelp and red algae on cobbles; *Alcyonidium* present.	
LB510	SS.SSa.IMuSa	Muddy sand with some organic matter on surface. Infaunal burrows, terebellid tentacles and feeding marks present.	
LB511	IR.HIR.KSed	Kelp and red algae on boulders. Variety of red algae and kelp species.	
LB512	SS.SSa.IMuSa	Muddy sand with some organic matter on surface. Infaunal burrows, terebellid tentacles and feeding marks present.	
LB513	IR.HIR.KFaR.FoR (top image) SS.SCS.ICS (bottom image)	Red algae on rocks with gravelly sand and shell material; anemones and *Asterias* present. Transitions to faunally impoverished coarse sand with some shell material.	

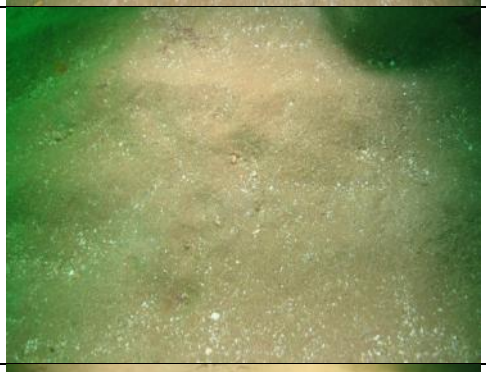
Station	Biotopes	Description	Example Images
			
LB514	IR.HIR.KSed	Red algae on rocks with gravelly sand and shell material. Patches of coarse sediment (incl. dead razor clams shells) between cobbles.	
LB515	SS.SSa.CMuSa	Muddy sand with shell material. Infaunal burrows, polychaete faecal casts and ophiuroids present.	
LB516	SS.SSa.CMuSa	Muddy sand with shell material and organic matter on surface. Infaunal burrows and *Scaphander lignarius.*	
LB517	SS.SSa.CMuSa (top image) SS.SCS.CCS (bottom image)	Muddy sand with infaunal burrows and some sparse surface gravel, becoming coarse sand, before returning back to muddy sand.	

Station	Biotopes	Description	Example Images
			
LB518	IR.HIR.KSed	Gravel and pebbles with algal cover. Red algae include large clumps of *Chondrus crispus.*	
LB519	IR.HIR.KFaR.FoR	Silt covered cobbles with *Dendrodoa, Esperiopsis*, barnacles and red algae.	
LB520	IR.HIR.KSed.XKScrR	Gravel and boulders with kelp and an understory of red algae (incl. *Dilsea carnosa* and *Delesseria sanguinea*).	
LB521	CR.HCR.XFa.FluCoAs.SmAs (top image) SS.SCS.CCS (bottom image)	Coarse sand with *Flustra, Alcyonidium, Urticina* and *Molgula*. Increasing amounts of pebbles of gravel and reduction in Flustra, before returning back to CR.HCR.XFa.FluCoAs.SmAs biotope.	

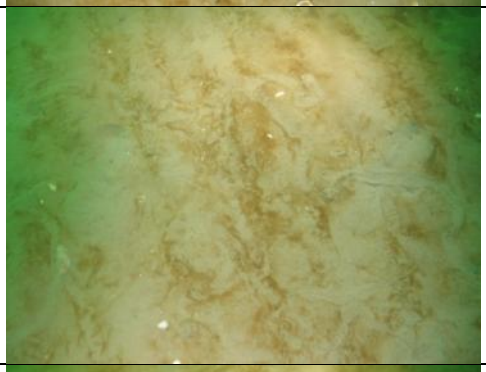
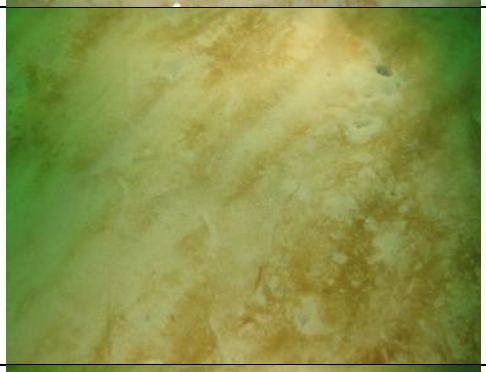
Station	Biotopes	Description	Example Images
			
LB601	SS.SMx.CMx.(FluHyd)	Slightly silty gravel, pebbles and shell material. Some barnacles, sponges, hydroids, *Cerianthus* and ophiuroids. Verging on SS.SCS.CCS biotope.	
LB602	SS.SCS.CCS	Coarse sand and shell gravel, with bands of bead bivalve shells.	
LB603	SS.SCS.CCS	Coarse sand and shell gravel, with bands of bead bivalve shells.	
LB604	SS.SMx.CMx.FluHyd	Coarse gravel and shell material (incl. dead *Modiolus*). *Flustra* and *Alcyonidium* present.	

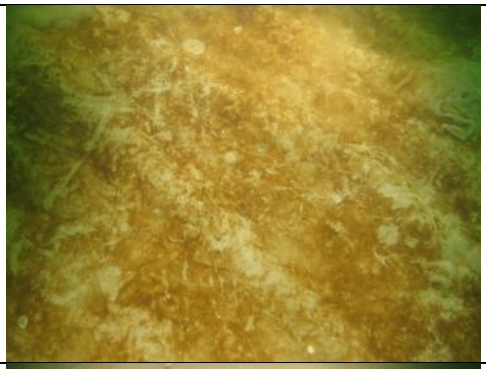
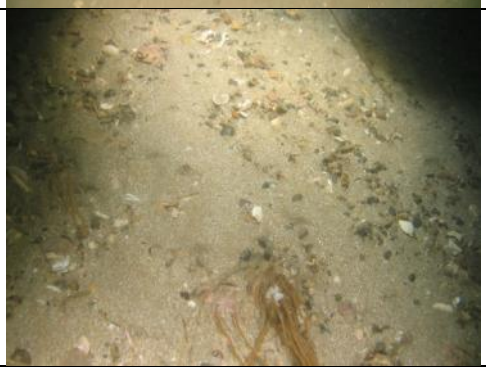
Station	Biotopes	Description	Example Images
LB605	SS.SCS.CCS	Coarse gravel with sand and shell material (incl. some *Modiolus* shells). *Alcyonidium* and *Lanice* present.	
LB606	SS.SCS.CCS	Coarse sand waves with sparse shell material and some *Alcyonidium*.	
LB607	SS.SCS.CCS	Coarse sand waves with gravel patches. *Alcyonidium*, ophiuroids and *Nemertesia* present.	
LB608	SS.SCS.CCS	Coarse gravel with some sand and shell material. Occasional patches of hydroids and bryozoans. Verging on FluHyd biotope.	
LB609	SS.SMx.CMx.FluHyd	Coarse gravel with some sand and shell material. Frequent patches of hydroids and bryozoans. Some sponges and *Crossaster* also present.	

Station	Biotopes	Description	Example Images
LB610	CR.HCR.XFa.(ByErSp)	Coarse sand and gravel, with some pebbles and cobbles. Faunal turf of bryozoans and hydroids on larger hard surfaces.	
LB001	SS.SCS.CCS	Coarse sand waves with some patches of gravel and shell material. Sparse *Alcyonidium*, bryozoans, and ophiuroids present.	
LB002	SS.SCS.CCS	Coarse sand waves with some patches of gravel and shell material. Sparse *Alcyonidium*, bryozoans, and ophiuroids present.	
LB003	SS.SCS.CCS	Coarse sand waves with some patches of gravel and shell material. Sparse *Alcyonidium*, bryozoans, and ophiuroids present.	
LB004	SS.SCS.ICS	Coarse sand and shell debris with *Alcyonidium*.	

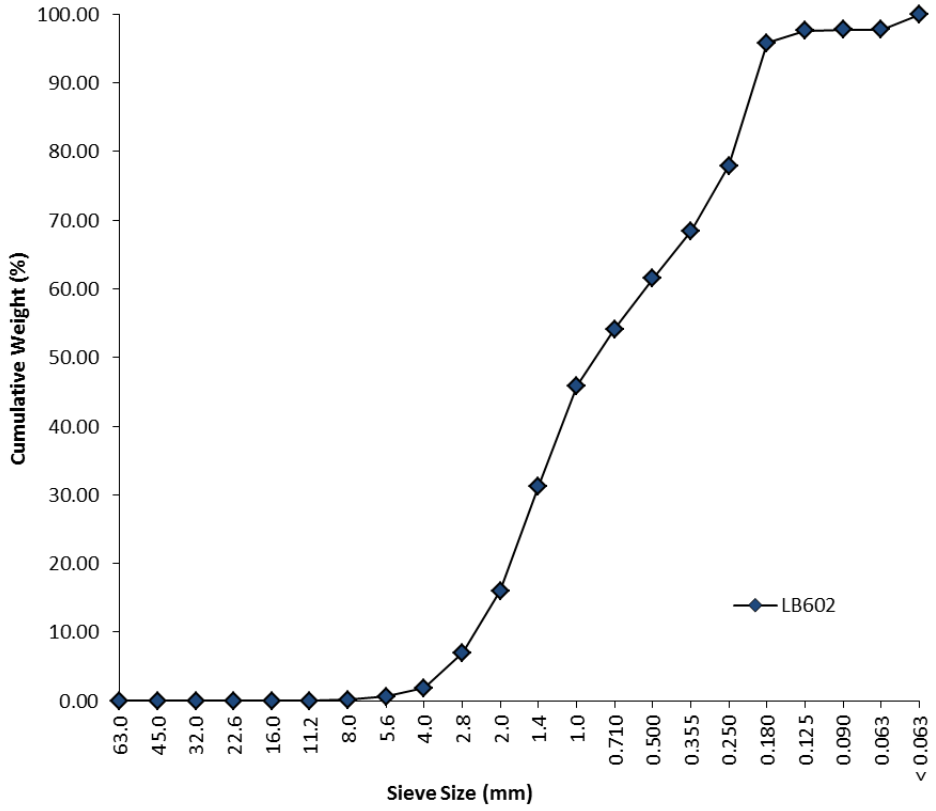
Station	Biotopes	Description	Example Images
LB005	SS.SCS.ICS	Coarse sand waves with polychaete faecal casts and some shell debris.	
LB006	SS.SCS.ICS	Coarse sand waves with polychaete faecal casts and some shell debris.	
LB007	SS.SSa.CMuSa	Muddy sand with infaunal burrows, polychaete faecal casts and ophiuroids.	
LB008	SS.SSa.CMuSa	Muddy sand with infaunal burrows, polychaete faecal casts and ophiuroids.	
LB009	SS.SSa.CMuSa	Muddy sand with infaunal burrows, polychaete faecal casts and ophiuroids.	

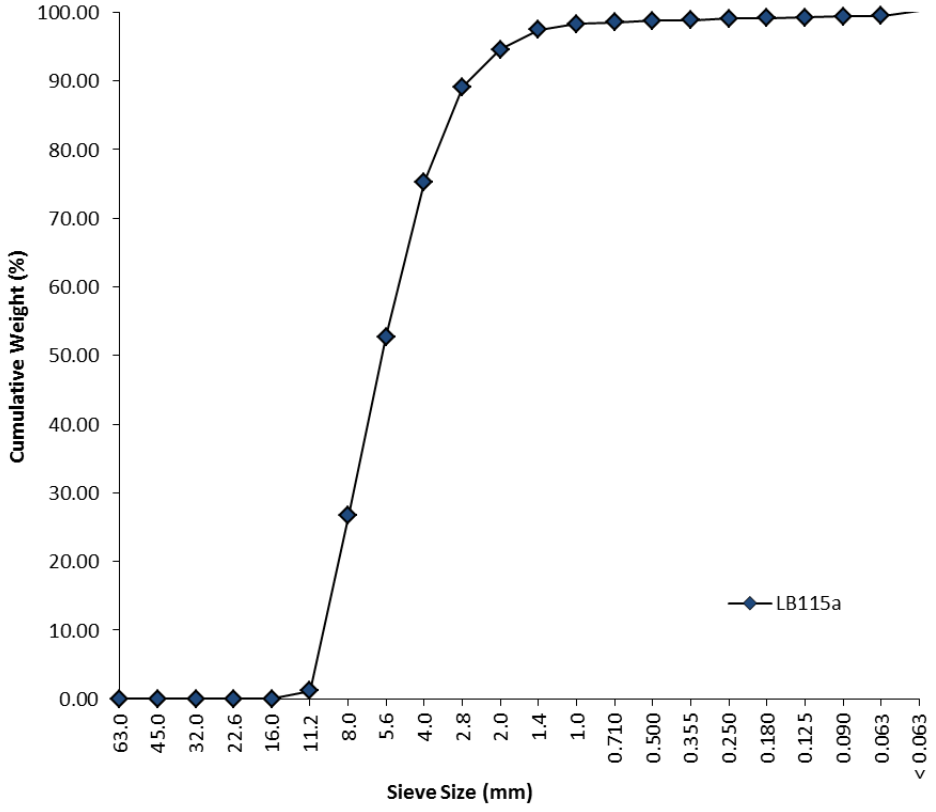
Station	Biotopes	Description	Example Images
LB010	SS.SMx.CMx	Mixed sediment of silt and coarse gravel and shell material (incl. *Modiolus* shells). Large amounts of *Alcyonidium*, some hydroids and nudibranch egg strings.	
LB011	SS.SMx.CMx	Mixed sediment of silt and coarse gravel and shell material (incl. *Modiolus* shells). Large amounts of *Alcyonidium*, some hydroids and nudibranch egg strings.	
LB012	SS.SMx.CMx	Mixed sediment of silt and coarse gravel and shell material (incl. *Modiolus* shells). Large amounts of *Alcyonidium*, some hydroids and nudibranch egg strings.	
LB013	SS.SSa.CMuSa	Muddy sand with infaunal burrows and ophiuroids.	
LB014	SS.SSa.CMuSa	Muddy sand with large number of dead gastropod shells on the surface. Paguridae, ophiuroids and *Asterias* present.	

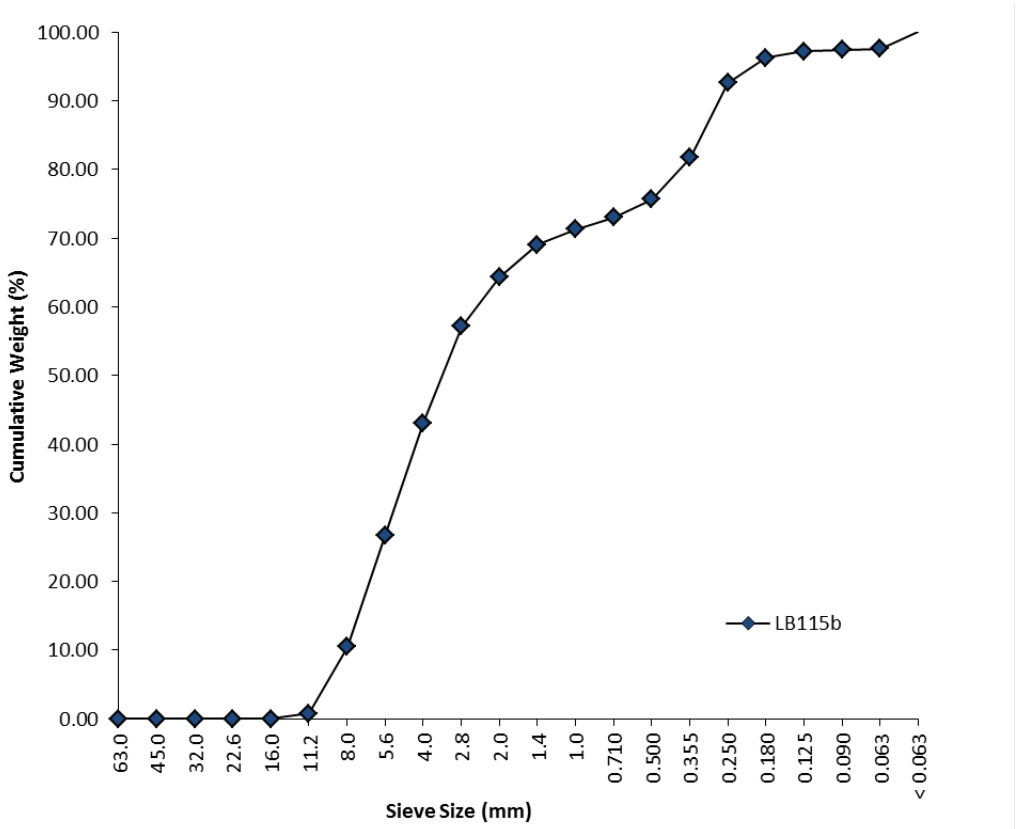
Station	Biotopes	Description	Example Images
LB015	SS.SSa.CMuSa	Muddy sand with infaunal burrows and ophiuroids.	
LB016	SS.SSa.IMuSa	Muddy sand with a high degree of surface organic matter. Infaunal burrows and feeding tracks visible.	
LB017	SS.SSa.IMuSa	Muddy sand with a high degree of surface organic matter. Infaunal burrows and feeding tracks visible.	
LB018	SS.SSa.IMuSa	Muddy sand with a high degree of surface organic matter. Infaunal burrows and feeding tracks visible.	
LB019	SS.SSa.IMuSa	Muddy sand with a high degree of surface organic matter. Infaunal burrows and feeding tracks visible.	

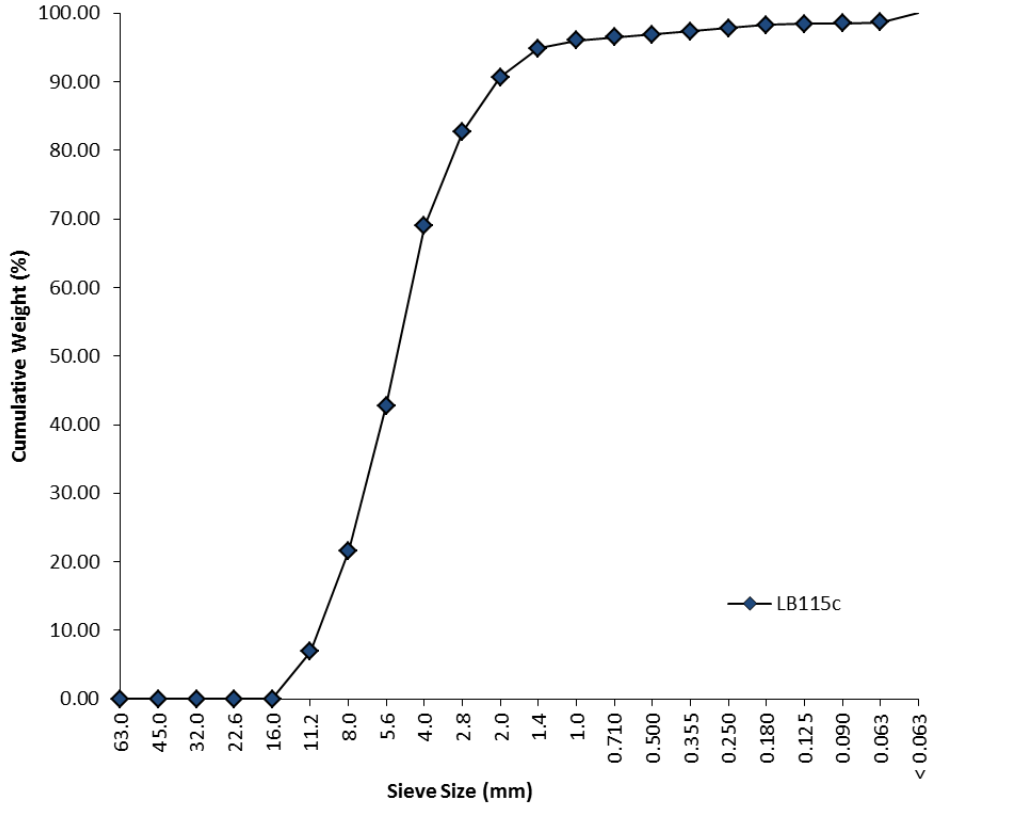
Station	Biotopes	Description	Example Images
LB020	SS.SSa.IMuSa	Muddy sand with a high degree of surface organic matter. Infaunal burrows and feeding tracks visible.	
LB021	SS.SSa.CMuSa	Muddy sand with sparse gravel and shell debris. Ophiuroids, pagurids and infaunal burrows present.	
LB022	SS.SSa.IFiSa(.ScupHyd)	Sand with some gravel and shell material. *Alcyonidium*, nudibranch egg strings and ophiuroids present.	

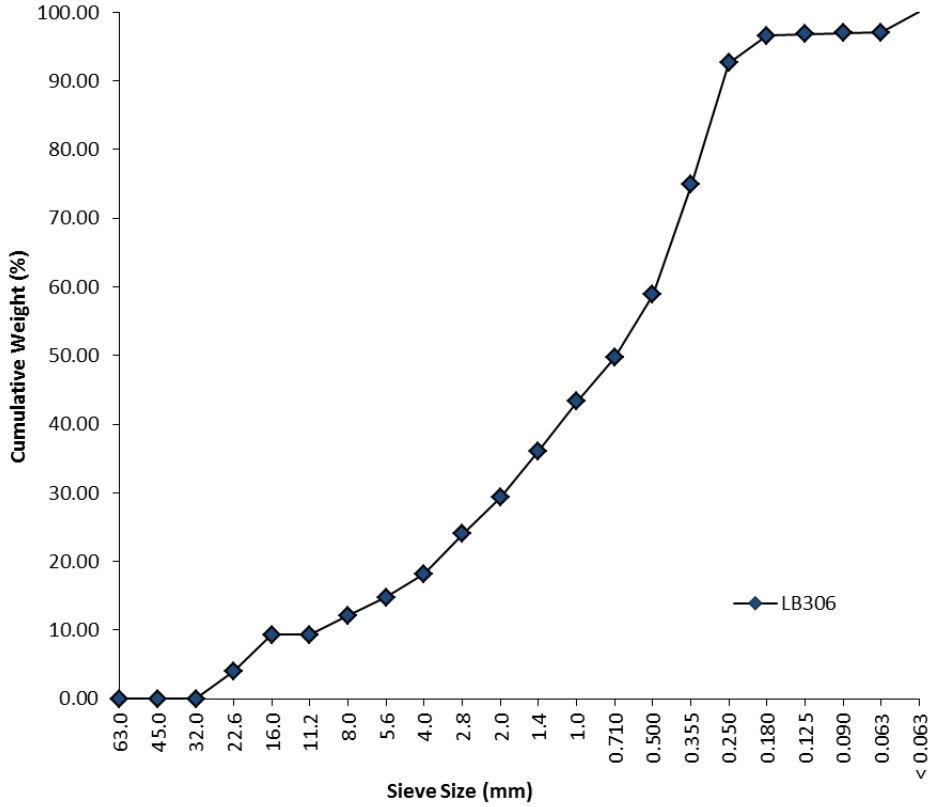
APPENDIX H. CUMULATIVE SEDIMENT WEIGHT PROFILES

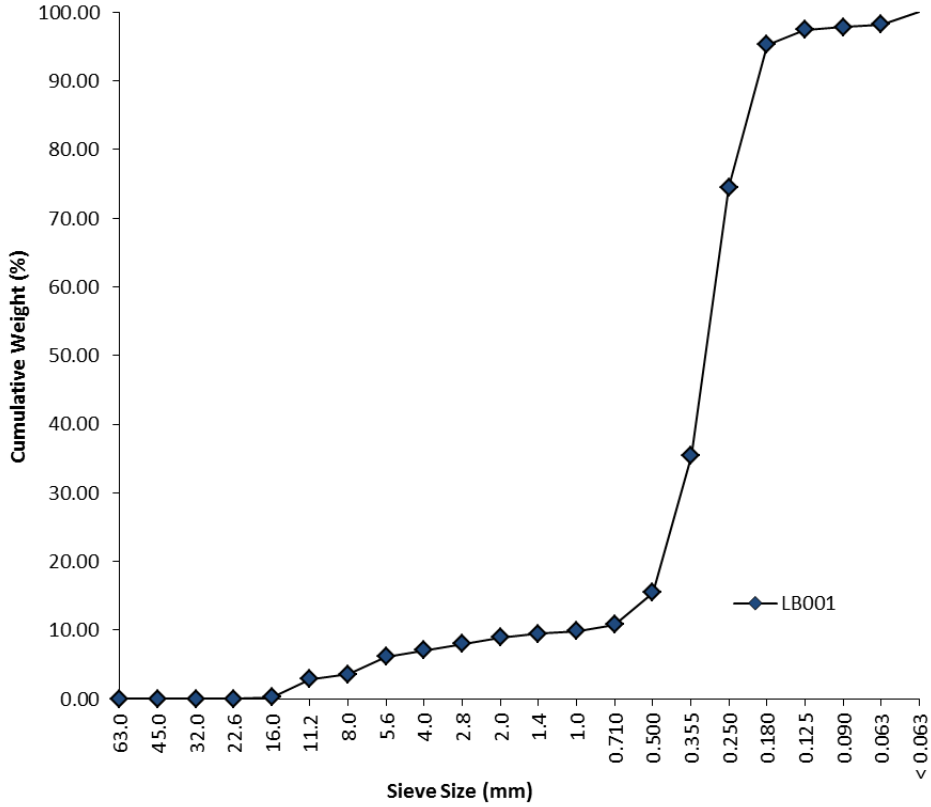


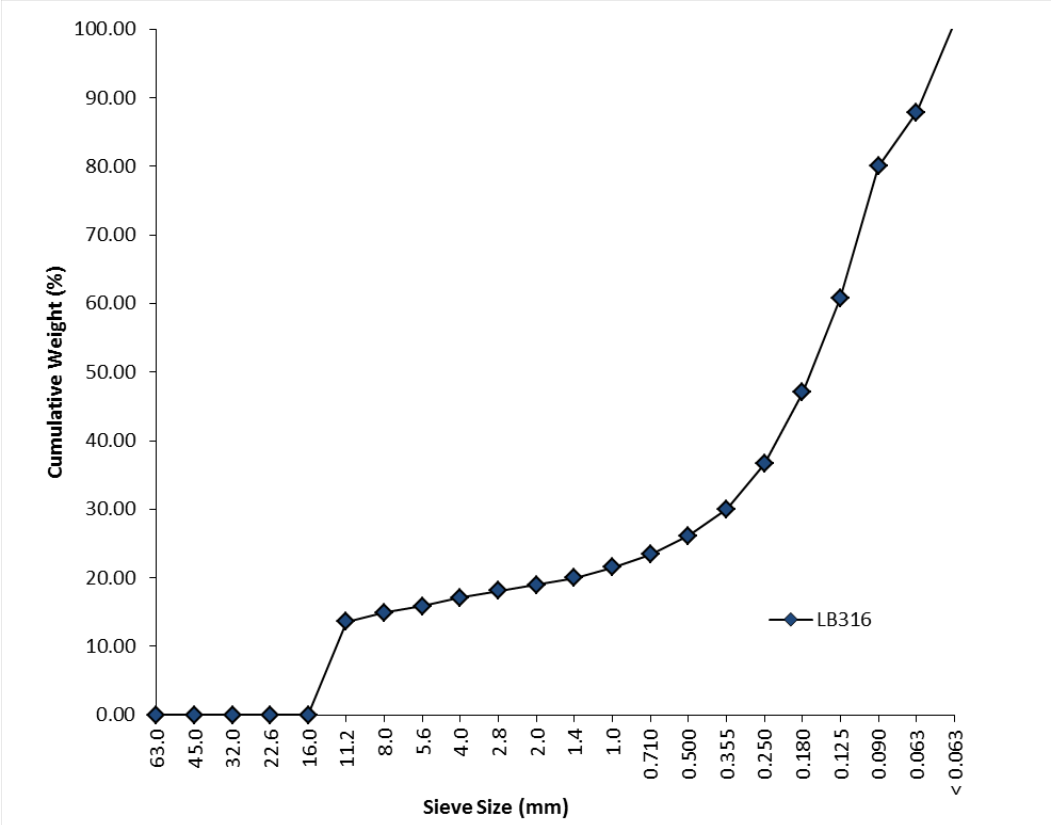


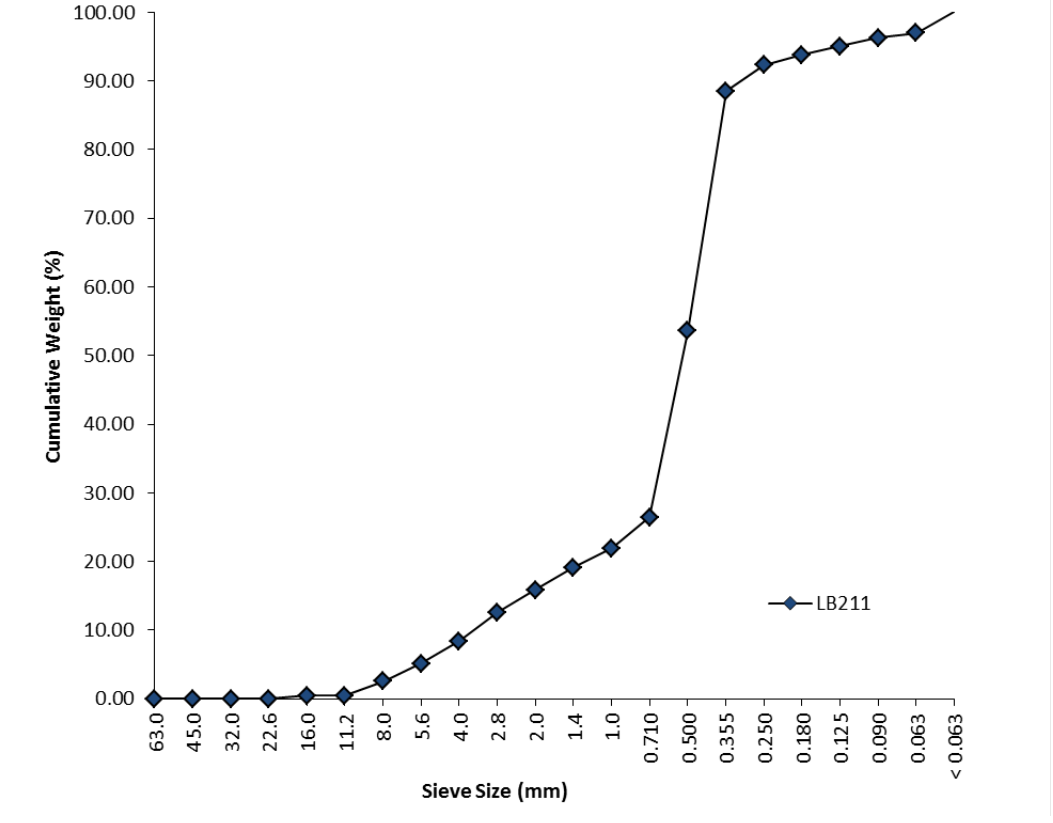

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)
LB115b

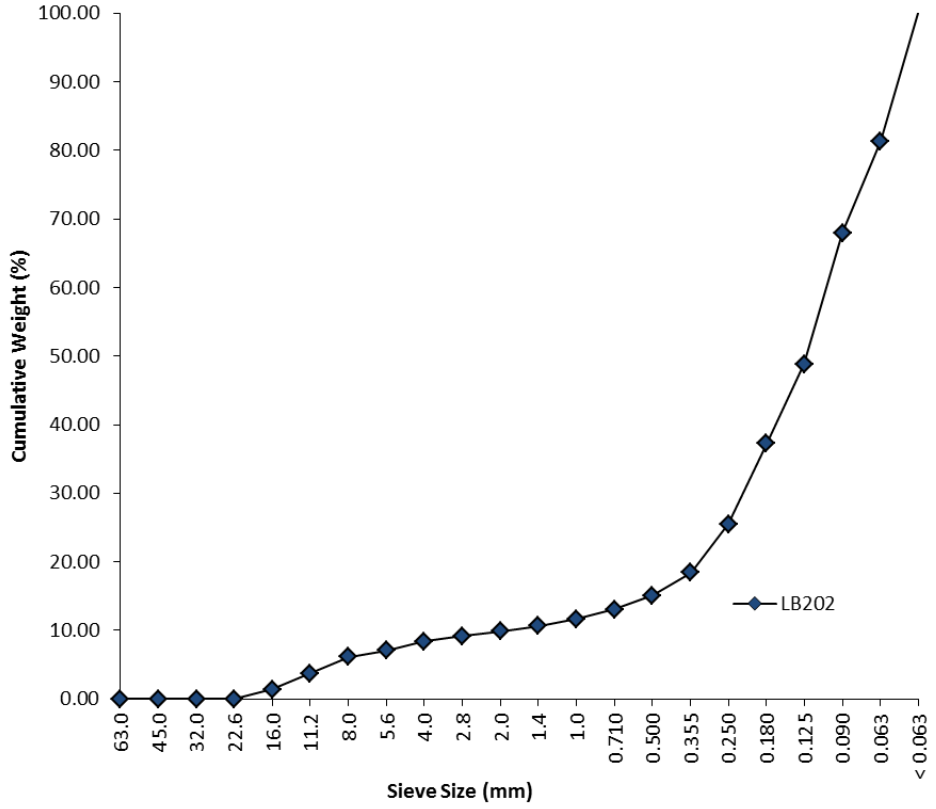

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)
LB115c

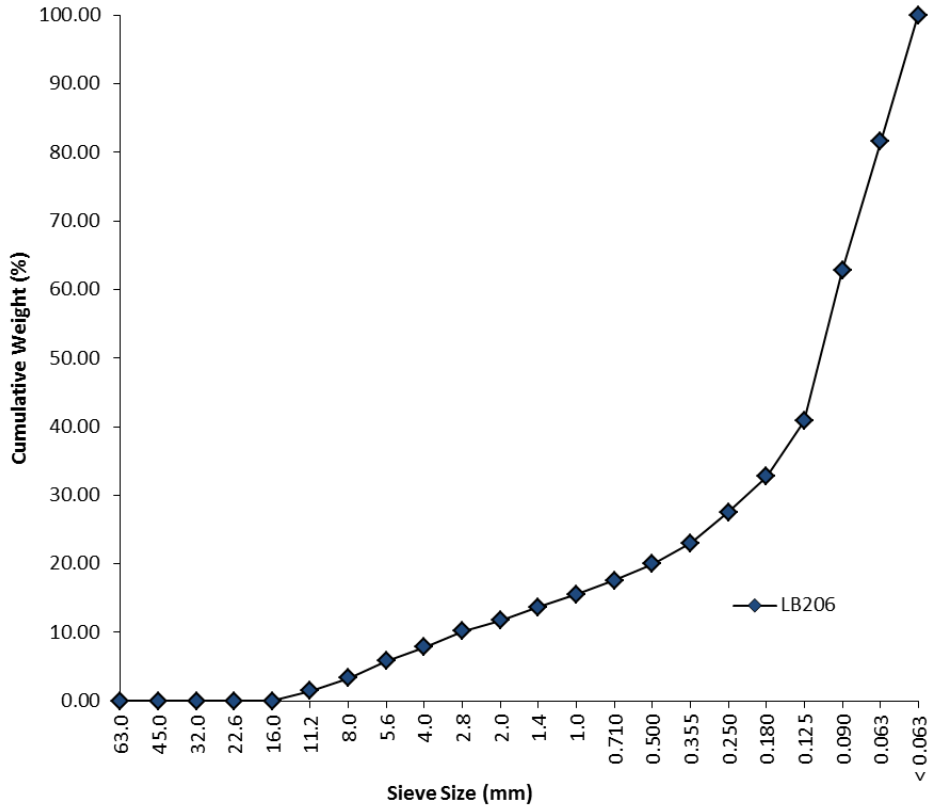

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)
LB306

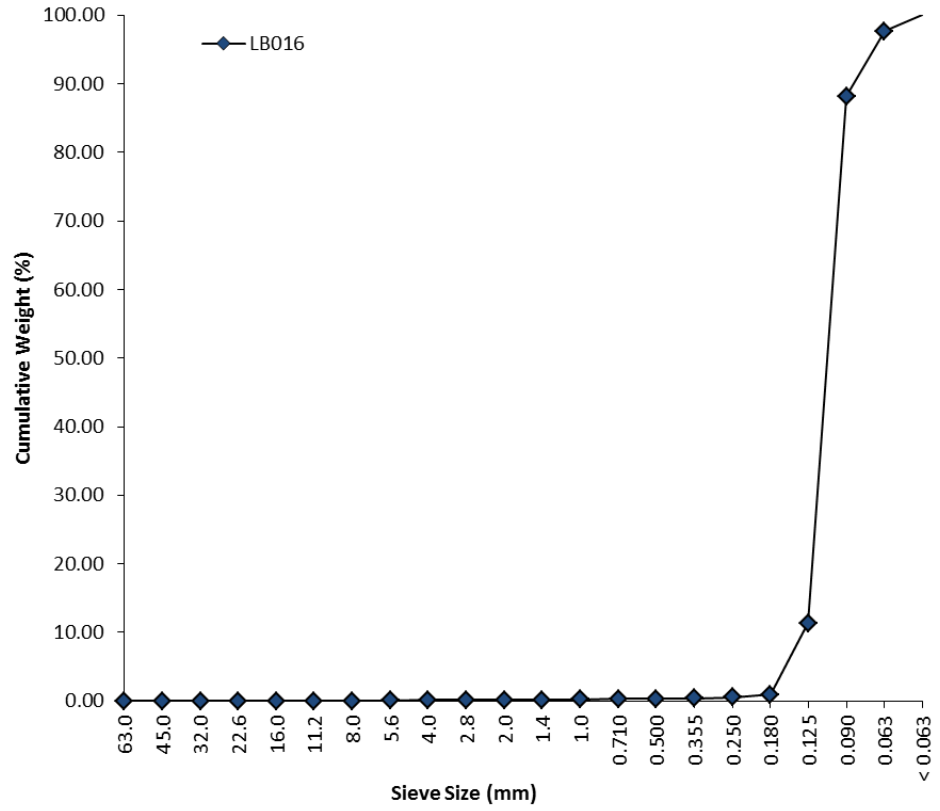

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)
LB001

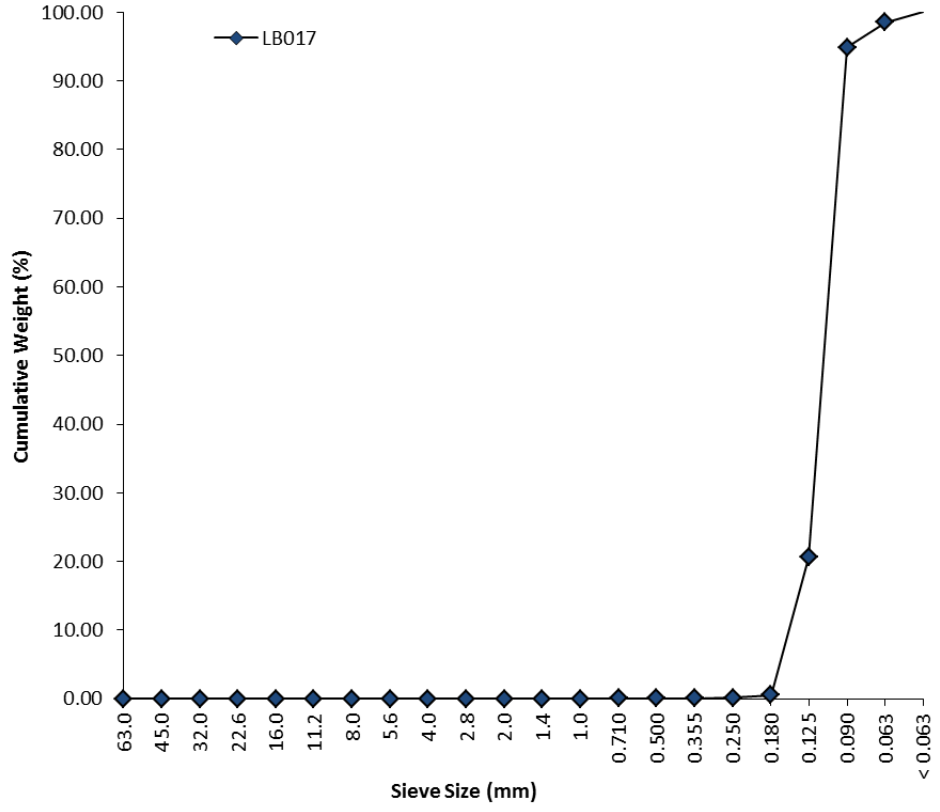

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)
LB316

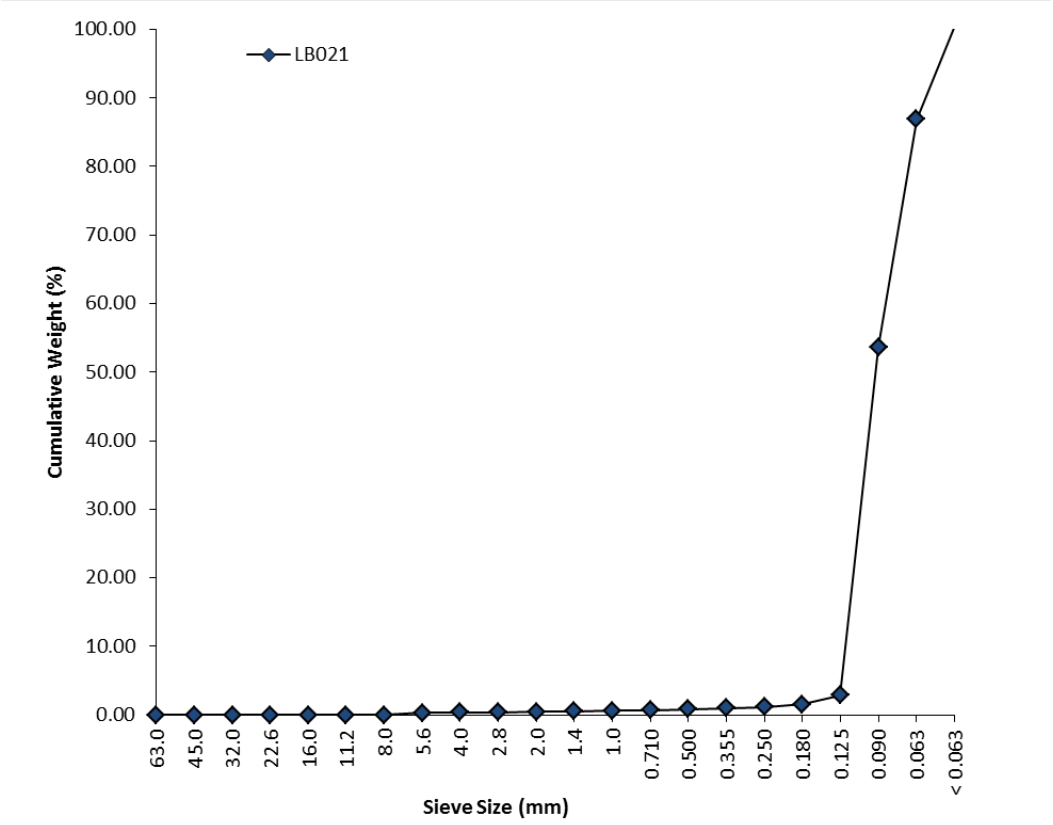

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)
LB211

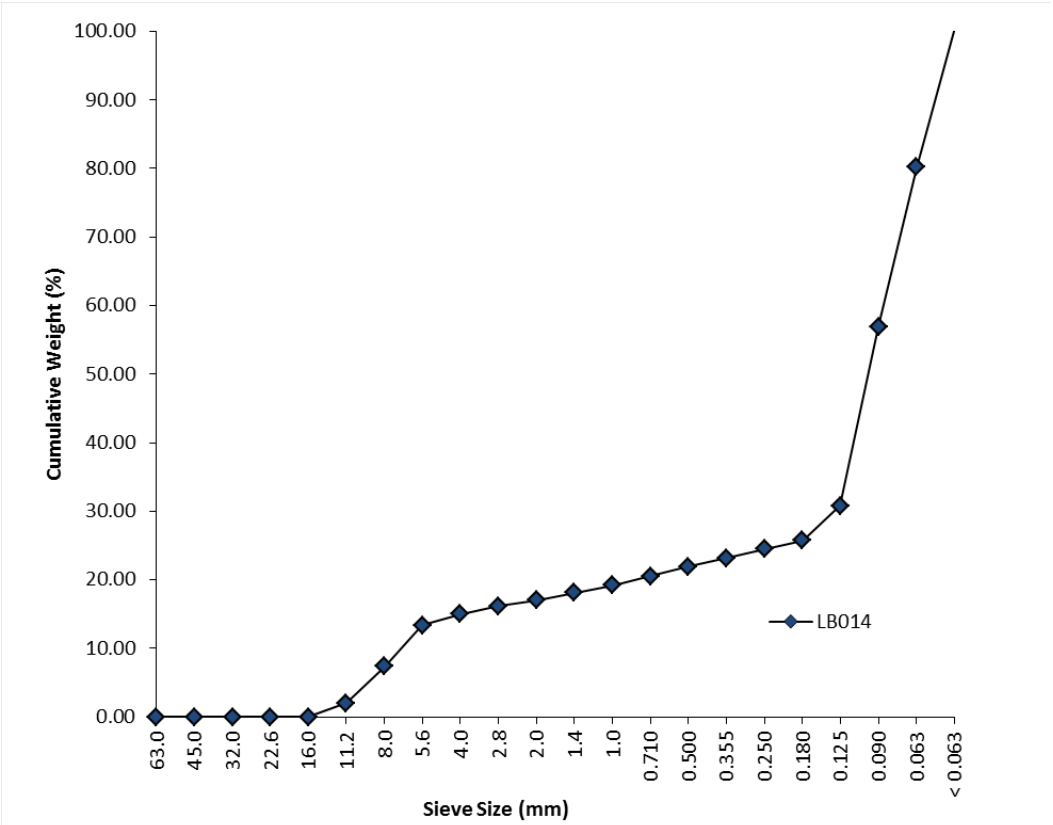

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
LB202
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)

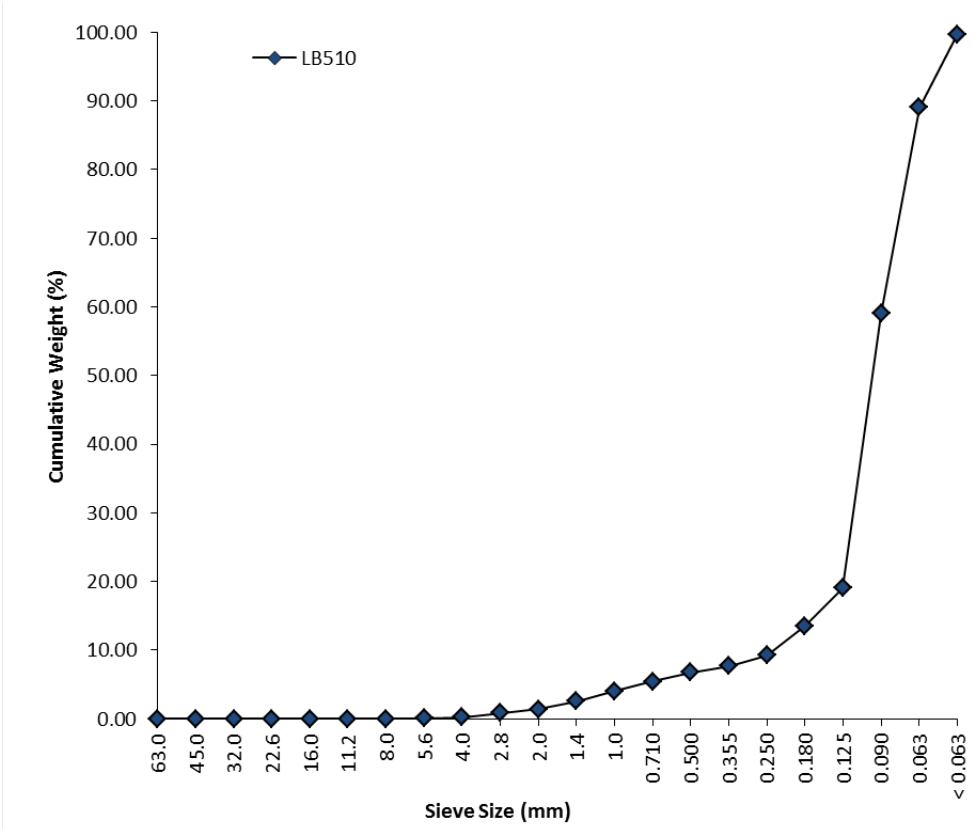

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
LB206
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)

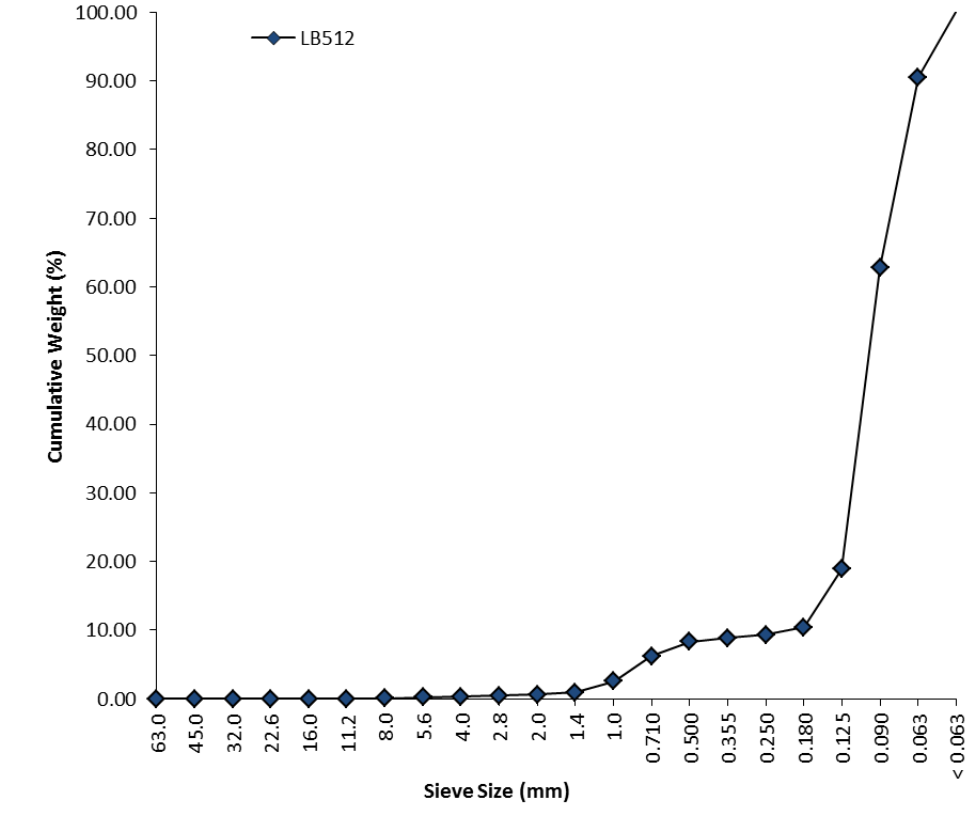

LB016
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)

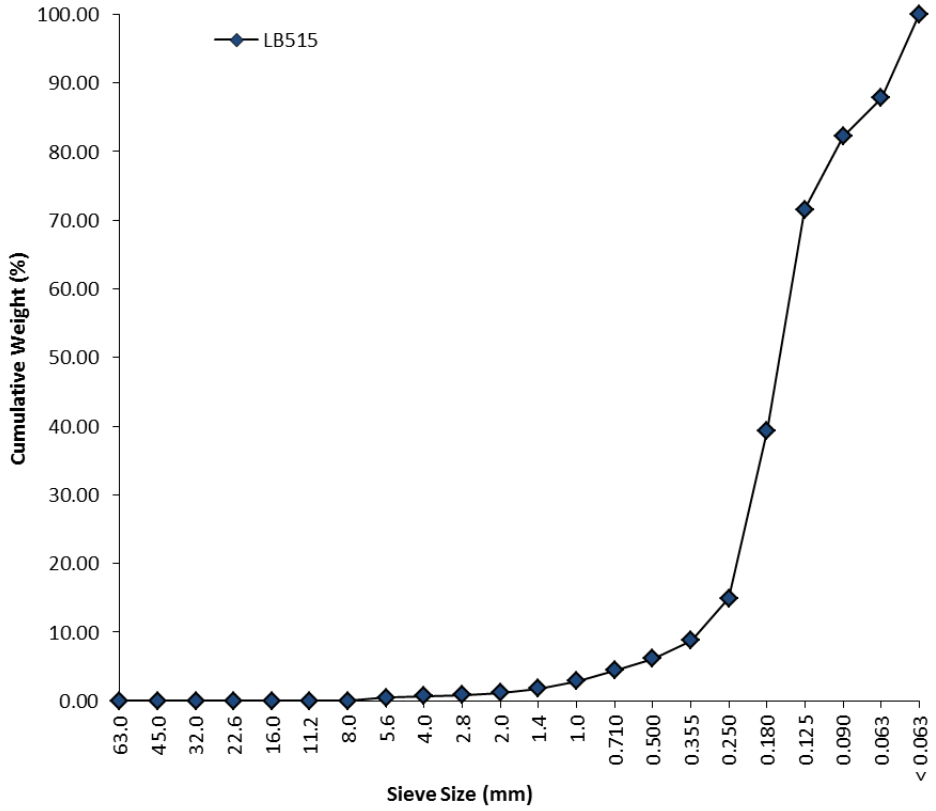

LB017
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)

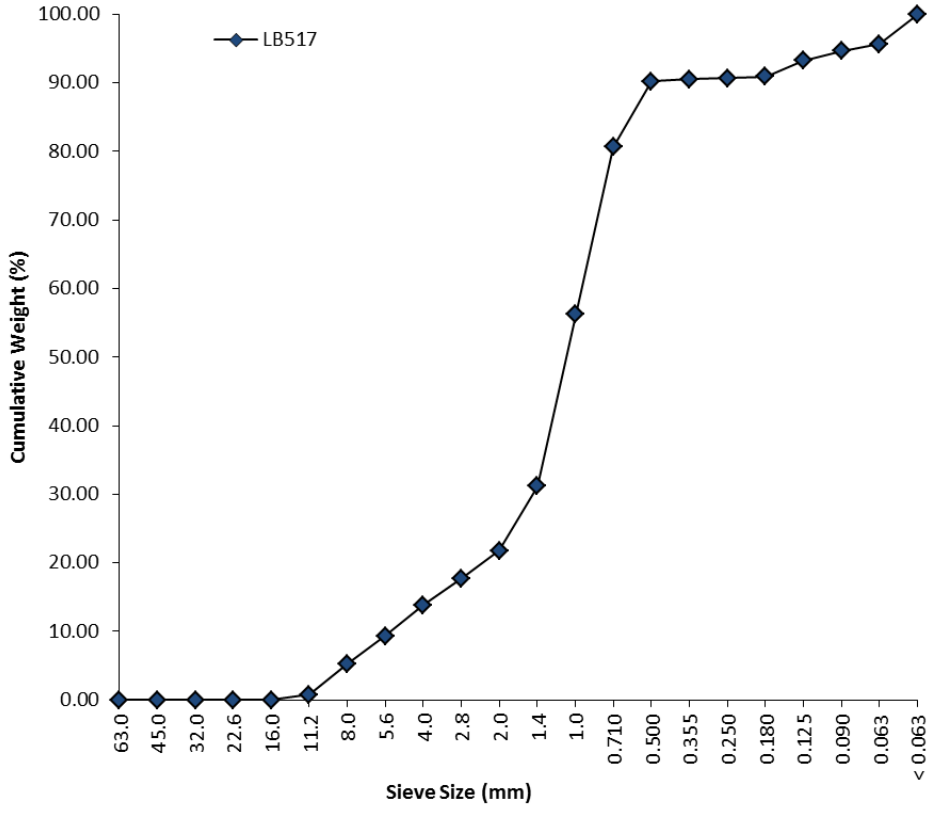

LB021
Cumulative Weight (%)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)


LB014
Cumulative Weight (%)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)


LB510
Cumulative Weight (%)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)


LB512
Cumulative Weight (%)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)


LB515
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)


LB517
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Cumulative Weight (%)
63.0
45.0
32.0
22.6
16.0
11.2
8.0
5.6
4.0
2.8
2.0
1.4
1.0
0.710
0.500
0.355
0.250
0.180
0.125
0.090
0.063
< 0.063
Sieve Size (mm)

Sediment sample statistics

SAMPLE: LB602	SAMPLE TYPE:	Bimodal, Poorly Sorted
	TEXTURAL GROUP:	Gravelly Sand
	SEDIMENT NAME:	Very Fine Gravelly Very Coarse Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	1147.0
	SORTING:	1096.1
	SKEWNESS:	2.135
	KURTOSIS:	11.19
METHOD OF MOMENTS Geometric (μm)	MEAN:	688.0
	SORTING:	3.167
	SKEWNESS:	-1.109
	KURTOSIS:	5.777
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	0.540
	SORTING:	1.663
	SKEWNESS:	1.109
	KURTOSIS:	5.777
FOLK AND WARD METHOD (μm)	MEAN:	722.7
	SORTING:	2.670
	SKEWNESS:	-0.138
	KURTOSIS:	0.667
FOLK AND WARD METHOD (Φ)	MEAN:	0.468
	SORTING:	1.417
	SKEWNESS:	0.138
	KURTOSIS:	0.667
FOLK AND WARD METHOD (Description)	MEAN:	Coarse Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Fine Skewed
	KURTOSIS:	Very Platykurtic
	MODE 1 (μm):	215.0
	MODE 2 (μm):	1200.0
	MODE 3 (μm):	
	MODE 1 (Φ):	2.237
	MODE 2 (Φ):	-0.243
	MODE 3 (Φ):	
	D_{10} (μm):	200.5
	D_{50} (μm):	842.9
	D_{90} (μm):	2502.4
	(D_{90} / D_{10}) (μm):	12.48
	(D_{90} - D_{10}) (μm):	2301.9
	(D_{75} / D_{25}) (μm):	5.818
	(D_{75} - D_{25}) (μm):	1343.0
	D_{10} (Φ):	-1.323
	D_{50} (Φ):	0.246
	D_{90} (Φ):	2.318
	(D_{90} / D_{10}) (Φ):	-1.752
	(D_{90} - D_{10}) (Φ):	3.642
	(D_{75} / D_{25}) (Φ):	-2.642
	(D_{75} - D_{25}) (Φ):	2.540

SAMPLE: LB115a	SAMPLE TYPE:	Unimodal, Moderately Sorted
	TEXTURAL GROUP:	Gravel
	SEDIMENT NAME:	Fine Gravel
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	6115.1
	SORTING:	2726.4
	SKEWNESS:	0.119
	KURTOSIS:	2.371
METHOD OF MOMENTS Geometric (μm)	MEAN:	5094.8
	SORTING:	2.225
	SKEWNESS:	-4.502
	KURTOSIS:	34.11
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	-2.349
	SORTING:	1.154
	SKEWNESS:	4.502
	KURTOSIS:	34.11
FOLK AND WARD METHOD (μm)	MEAN:	5540.4
	SORTING:	1.700
	SKEWNESS:	-0.219
	KURTOSIS:	1.008
FOLK AND WARD METHOD (Φ)	MEAN:	-2.470
	SORTING:	0.766
	SKEWNESS:	0.219
	KURTOSIS:	1.008
FOLK AND WARD METHOD (Description)	MEAN:	Fine Gravel
	SORTING:	Moderately Sorted
	SKEWNESS:	Fine Skewed
	KURTOSIS:	Mesokurtic
	MODE 1 (μm):	9600.0
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	-3.243
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	2625.1
	D_{50} (μm):	5804.7
	D_{90} (μm):	9964.6
	(D_{90} / D_{10}) (μm):	3.796
	(D_{90} - D_{10}) (μm):	7339.5
	(D_{75} / D_{25}) (μm):	2.037
	(D_{75} - D_{25}) (μm):	4160.0
	D_{10} (Φ):	-3.317
	D_{50} (Φ):	-2.537
	D_{90} (Φ):	-1.392
	(D_{90} / D_{10}) (Φ):	0.420
	(D_{90} - D_{10}) (Φ):	1.924
	(D_{75} / D_{25}) (Φ):	0.661
	(D_{75} - D_{25}) (Φ):	1.027

SAMPLE: LB115b	SAMPLE TYPE:	Bimodal, Poorly Sorted
	TEXTURAL GROUP:	Sandy Gravel
	SEDIMENT NAME:	Sandy Fine Gravel
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	3783.5
	SORTING:	3095.6
	SKEWNESS:	0.616
	KURTOSIS:	2.606
METHOD OF MOMENTS Geometric (μm)	MEAN:	1934.0
	SORTING:	4.531
	SKEWNESS:	-1.383
	KURTOSIS:	5.124
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	-0.952
	SORTING:	2.180
	SKEWNESS:	1.383
	KURTOSIS:	5.124
FOLK AND WARD METHOD (μm)	MEAN:	1987.2
	SORTING:	3.870
	SKEWNESS:	-0.483
	KURTOSIS:	0.671
FOLK AND WARD METHOD (Φ)	MEAN:	-0.991
	SORTING:	1.952
	SKEWNESS:	0.483
	KURTOSIS:	0.671
FOLK AND WARD METHOD (Description)	MEAN:	Very Coarse Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Very Fine Skewed
	KURTOSIS:	Platykurtic
	MODE 1 (μm):	4800.0
	MODE 2 (μm):	302.5
	MODE 3 (μm):	
	MODE 1 (Φ):	-2.243
	MODE 2 (Φ):	1.747
	MODE 3 (Φ):	
	D_{10} (μm):	272.0
	D_{50} (μm):	3357.0
	D_{90} (μm):	8133.2
	(D_{90} / D_{10}) (μm):	29.90
	(D_{90} - D_{10}) (μm):	7861.2
	(D_{75} / D_{25}) (μm):	10.64
	(D_{75} - D_{25}) (μm):	5264.2
	D_{10} (Φ):	-3.024
	D_{50} (Φ):	-1.747
	D_{90} (Φ):	1.878
	(D_{90} / D_{10}) (Φ):	-0.621
	(D_{90} - D_{10}) (Φ):	4.902
	(D_{75} / D_{25}) (Φ):	-0.344
	(D_{75} - D_{25}) (Φ):	3.411

SAMPLE: LB115c	SAMPLE TYPE:	Unimodal, Moderately Sorted
	TEXTURAL GROUP:	Gravel
	SEDIMENT NAME:	Fine Gravel
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	5803.8
	SORTING:	3266.5
	SKEWNESS:	0.718
	KURTOSIS:	3.127
METHOD OF MOMENTS Geometric (μm)	MEAN:	4414.9
	SORTING:	2.757
	SKEWNESS:	-3.685
	KURTOSIS:	22.16
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	-2.142
	SORTING:	1.463
	SKEWNESS:	3.685
	KURTOSIS:	22.16
FOLK AND WARD METHOD (μm)	MEAN:	4977.7
	SORTING:	1.903
	SKEWNESS:	-0.131
	KURTOSIS:	1.146
FOLK AND WARD METHOD (Φ)	MEAN:	-2.315
	SORTING:	0.928
	SKEWNESS:	0.131
	KURTOSIS:	1.146
FOLK AND WARD METHOD (Description)	MEAN:	Fine Gravel
	SORTING:	Moderately Sorted
	SKEWNESS:	Fine Skewed
	KURTOSIS:	Leptokurtic
	MODE 1 (μm):	4800.0
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	-2.243
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	2060.1
	D_{50} (μm):	5103.0
	D_{90} (μm):	10437.5
	(D_{90} / D_{10}) (μm):	5.067
	(D_{90} - D_{10}) (μm):	8377.4
	(D_{75} / D_{25}) (μm):	2.208
	(D_{75} - D_{25}) (μm):	4134.4
	D_{10} (Φ):	-3.384
	D_{50} (Φ):	-2.351
	D_{90} (Φ):	-1.043
	(D_{90} / D_{10}) (Φ):	0.308
	(D_{90} - D_{10}) (Φ):	2.341
	(D_{75} / D_{25}) (Φ):	0.608
	(D_{75} - D_{25}) (Φ):	1.143

SAMPLE: LB306	SAMPLE TYPE:	Polymodal, Very Poorly Sorted
	TEXTURAL GROUP:	Gravelly Sand
	SEDIMENT NAME:	Very Fine Gravelly Medium Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	3482.7
	SORTING:	6529.7
	SKEWNESS:	2.575
	KURTOSIS:	8.574
METHOD OF MOMENTS Geometric (μm)	MEAN:	989.2
	SORTING:	4.987
	SKEWNESS:	-0.102
	KURTOSIS:	4.114
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	0.016
	SORTING:	2.318
	SKEWNESS:	0.102
	KURTOSIS:	4.114
FOLK AND WARD METHOD (μm)	MEAN:	1010.2
	SORTING:	4.082
	SKEWNESS:	0.429
	KURTOSIS:	0.946
FOLK AND WARD METHOD (Φ)	MEAN:	-0.015
	SORTING:	2.029
	SKEWNESS:	-0.429
	KURTOSIS:	0.946
FOLK AND WARD METHOD (Description)	MEAN:	Very Coarse Sand
	SORTING:	Very Poorly Sorted
	SKEWNESS:	Very Coarse Skewed
	KURTOSIS:	Mesokurtic
	MODE 1 (μm):	302.5
	MODE 2 (μm):	1200.0
	MODE 3 (μm):	3400.0
	MODE 1 (Φ):	1.747
	MODE 2 (Φ):	-0.243
	MODE 3 (Φ):	-1.743
	D_{10} (μm):	263.1
	D_{50} (μm):	701.4
	D_{90} (μm):	10289.9
	(D_{90} / D_{10}) (μm):	39.12
	(D_{90} - D_{10}) (μm):	10026.8
	(D_{75} / D_{25}) (μm):	7.440
	(D_{75} - D_{25}) (μm):	2279.8
	D_{10} (Φ):	-3.363
	D_{50} (Φ):	0.512
	D_{90} (Φ):	1.927
	(D_{90} / D_{10}) (Φ):	-0.573
	(D_{90} - D_{10}) (Φ):	5.290
	(D_{75} / D_{25}) (Φ):	-1.072
	(D_{75} - D_{25}) (Φ):	2.895

SAMPLE: LB001	SAMPLE TYPE:	Unimodal, Poorly Sorted
	TEXTURAL GROUP:	Gravelly Sand
	SEDIMENT NAME:	Fine Gravelly Medium Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	1044.6
	SORTING:	2629.9
	SKEWNESS:	4.085
	KURTOSIS:	19.83
METHOD OF MOMENTS Geometric (μm)	MEAN:	380.6
	SORTING:	3.032
	SKEWNESS:	0.967
	KURTOSIS:	8.100
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	1.393
	SORTING:	1.600
	SKEWNESS:	-0.967
	KURTOSIS:	8.100
FOLK AND WARD METHOD (μm)	MEAN:	321.2
	SORTING:	2.123
	SKEWNESS:	0.405
	KURTOSIS:	2.741
FOLK AND WARD METHOD (Φ)	MEAN:	1.639
	SORTING:	1.086
	SKEWNESS:	-0.405
	KURTOSIS:	2.741
FOLK AND WARD METHOD (Description)	MEAN:	Medium Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Very Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	302.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	1.747
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	195.5
	D_{50} (μm):	311.2
	D_{90} (μm):	952.7
	(D_{90} / D_{10}) (μm):	4.873
	(D_{90} - D_{10}) (μm):	757.2
	(D_{75} / D_{25}) (μm):	1.711
	(D_{75} - D_{25}) (μm):	176.2
	D_{10} (Φ):	0.070
	D_{50} (Φ):	1.684
	D_{90} (Φ):	2.355
	(D_{90} / D_{10}) (Φ):	33.69
	(D_{90} - D_{10}) (Φ):	2.285
	(D_{75} / D_{25}) (Φ):	1.626
	(D_{75} - D_{25}) (Φ):	0.775

SAMPLE: LB316	SAMPLE TYPE:	Bimodal, Very Poorly Sorted
	TEXTURAL GROUP:	Gravelly Muddy Sand
	SEDIMENT NAME:	Medium Gravelly Coarse Silty Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	2315.5
	SORTING:	4669.3
	SKEWNESS:	1.891
	KURTOSIS:	4.734
METHOD OF MOMENTS Geometric (μm)	MEAN:	257.1
	SORTING:	8.525
	SKEWNESS:	0.431
	KURTOSIS:	2.721
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	1.960
	SORTING:	3.092
	SKEWNESS:	-0.431
	KURTOSIS:	2.721
FOLK AND WARD METHOD (μm)	MEAN:	396.0
	SORTING:	8.527
	SKEWNESS:	0.434
	KURTOSIS:	1.659
FOLK AND WARD METHOD (Φ)	MEAN:	1.336
	SORTING:	3.092
	SKEWNESS:	-0.434
	KURTOSIS:	1.659
FOLK AND WARD METHOD (Description)	MEAN:	Medium Sand
	SORTING:	Very Poorly Sorted
	SKEWNESS:	Very Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	13600.0
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	-3.743
	MODE 3 (Φ):	
	D_{10} (μm):	33.94
	D_{50} (μm):	164.6
	D_{90} (μm):	12291.2
	(D_{90} / D_{10}) (μm):	362.1
	(D_{90} - D_{10}) (μm):	12257.3
	(D_{75} / D_{25}) (μm):	5.786
	(D_{75} - D_{25}) (μm):	464.3
	D_{10} (Φ):	-3.620
	D_{50} (Φ):	2.603
	D_{90} (Φ):	4.881
	(D_{90} / D_{10}) (Φ):	-1.348
	(D_{90} - D_{10}) (Φ):	8.500
	(D_{75} / D_{25}) (Φ):	4.040
	(D_{75} - D_{25}) (Φ):	2.533

SAMPLE: LB211	SAMPLE TYPE:	Unimodal, Poorly Sorted
	TEXTURAL GROUP:	Gravelly Sand
	SEDIMENT NAME:	Very Fine Gravelly Medium Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	1298.4
	SORTING:	2188.1
	SKEWNESS:	4.023
	KURTOSIS:	24.72
METHOD OF MOMENTS Geometric (μm)	MEAN:	621.2
	SORTING:	3.372
	SKEWNESS:	-0.680
	KURTOSIS:	6.878
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	0.687
	SORTING:	1.754
	SKEWNESS:	0.680
	KURTOSIS:	6.878
FOLK AND WARD METHOD (μm)	MEAN:	725.5
	SORTING:	2.707
	SKEWNESS:	0.419
	KURTOSIS:	2.348
FOLK AND WARD METHOD (Φ)	MEAN:	0.463
	SORTING:	1.437
	SKEWNESS:	-0.419
	KURTOSIS:	2.348
FOLK AND WARD METHOD (Description)	MEAN:	Coarse Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Very Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	427.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	1.247
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	308.6
	D_{50} (μm):	523.6
	D_{90} (μm):	3477.1
	(D_{90} / D_{10}) (μm):	11.27
	(D_{90} - D_{10}) (μm):	3168.5
	(D_{75} / D_{25}) (μm):	1.949
	(D_{75} - D_{25}) (μm):	384.3
	D_{10} (Φ):	-1.798
	D_{50} (Φ):	0.933
	D_{90} (Φ):	1.696
	(D_{90} / D_{10}) (Φ):	-0.943
	(D_{90} - D_{10}) (Φ):	3.494
	(D_{75} / D_{25}) (Φ):	3.823
	(D_{75} - D_{25}) (Φ):	0.962

SAMPLE: LB202	SAMPLE TYPE:	Bimodal, Very Poorly Sorted
	TEXTURAL GROUP:	Gravelly Muddy Sand
	SEDIMENT NAME:	Medium Gravelly Very Coarse Silty Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	1152.3
	SORTING:	3366.2
	SKEWNESS:	3.771
	KURTOSIS:	17.07
METHOD OF MOMENTS Geometric (μm)	MEAN:	136.1
	SORTING:	6.644
	SKEWNESS:	0.505
	KURTOSIS:	3.517
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	2.877
	SORTING:	2.732
	SKEWNESS:	-0.505
	KURTOSIS:	3.517
FOLK AND WARD METHOD (μm)	MEAN:	133.2
	SORTING:	5.264
	SKEWNESS:	0.169
	KURTOSIS:	2.337
FOLK AND WARD METHOD (Φ)	MEAN:	2.909
	SORTING:	2.396
	SKEWNESS:	-0.169
	KURTOSIS:	2.337
FOLK AND WARD METHOD (Description)	MEAN:	Fine Sand
	SORTING:	Very Poorly Sorted
	SKEWNESS:	Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	215.0
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	2.237
	MODE 3 (Φ):	
	D_{10} (μm):	17.31
	D_{50} (μm):	122.5
	D_{90} (μm):	1899.4
	(D_{90} / D_{10}) (μm):	109.7
	(D_{90} - D_{10}) (μm):	1882.1
	(D_{75} / D_{25}) (μm):	3.436
	(D_{75} - D_{25}) (μm):	181.8
	D_{10} (Φ):	-0.926
	D_{50} (Φ):	3.030
	D_{90} (Φ):	5.852
	(D_{90} / D_{10}) (Φ):	-6.323
	(D_{90} - D_{10}) (Φ):	6.778
	(D_{75} / D_{25}) (Φ):	1.907
	(D_{75} - D_{25}) (Φ):	1.781

SAMPLE: LB206	SAMPLE TYPE:	Unimodal, Very Poorly Sorted
	TEXTURAL GROUP:	Gravelly Muddy Sand
	SEDIMENT NAME:	Fine Gravelly Very Coarse Silty Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	942.0
	SORTING:	2369.8
	SKEWNESS:	3.571
	KURTOSIS:	16.19
METHOD OF MOMENTS Geometric (μm)	MEAN:	136.9
	SORTING:	6.716
	SKEWNESS:	0.395
	KURTOSIS:	2.941
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	2.869
	SORTING:	2.748
	SKEWNESS:	-0.395
	KURTOSIS:	2.941
FOLK AND WARD METHOD (μm)	MEAN:	164.3
	SORTING:	5.853
	SKEWNESS:	0.314
	KURTOSIS:	1.874
FOLK AND WARD METHOD (Φ)	MEAN:	2.605
	SORTING:	2.549
	SKEWNESS:	-0.314
	KURTOSIS:	1.874
FOLK AND WARD METHOD (Description)	MEAN:	Fine Sand
	SORTING:	Very Poorly Sorted
	SKEWNESS:	Very Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	17.72
	D_{50} (μm):	109.0
	D_{90} (μm):	2891.1
	(D_{90} / D_{10}) (μm):	163.2
	(D_{90} - D_{10}) (μm):	2873.4
	(D_{75} / D_{25}) (μm):	4.261
	(D_{75} - D_{25}) (μm):	232.9
	D_{10} (Φ):	-1.532
	D_{50} (Φ):	3.198
	D_{90} (Φ):	5.819
	(D_{90} / D_{10}) (Φ):	-3.799
	(D_{90} - D_{10}) (Φ):	7.350
	(D_{75} / D_{25}) (Φ):	2.219
	(D_{75} - D_{25}) (Φ):	2.091

SAMPLE: LB016	SAMPLE TYPE:	Unimodal, Very Well Sorted
	TEXTURAL GROUP:	Slightly Gravelly Sand
	SEDIMENT NAME:	Slightly Fine Gravelly Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	117.6
	SORTING:	220.6
	SKEWNESS:	27.78
	KURTOSIS:	819.3
METHOD OF MOMENTS Geometric (μm)	MEAN:	101.5
	SORTING:	1.594
	SKEWNESS:	-2.796
	KURTOSIS:	30.24
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	3.300
	SORTING:	0.673
	SKEWNESS:	2.796
	KURTOSIS:	30.24
FOLK AND WARD METHOD (μm)	MEAN:	106.0
	SORTING:	1.216
	SKEWNESS:	-0.021
	KURTOSIS:	1.550
FOLK AND WARD METHOD (Φ)	MEAN:	3.238
	SORTING:	0.282
	SKEWNESS:	0.021
	KURTOSIS:	1.550
FOLK AND WARD METHOD (Description)	MEAN:	Very Fine Sand
	SORTING:	Very Well Sorted
	SKEWNESS:	Symmetrical
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	83.99
	D_{50} (μm):	106.0
	D_{90} (μm):	131.2
	(D_{90} / D_{10}) (μm):	1.562
	(D_{90} - D_{10}) (μm):	47.16
	(D_{75} / D_{25}) (μm):	1.238
	(D_{75} - D_{25}) (μm):	22.71
	D_{10} (Φ):	2.931
	D_{50} (Φ):	3.238
	D_{90} (Φ):	3.574
	(D_{90} / D_{10}) (Φ):	1.219
	(D_{90} - D_{10}) (Φ):	0.643
	(D_{75} / D_{25}) (Φ):	1.100
	(D_{75} - D_{25}) (Φ):	0.309

SAMPLE: LB017	SAMPLE TYPE:	Unimodal, Very Well Sorted
	TEXTURAL GROUP:	Slightly Gravelly Sand
	SEDIMENT NAME:	Slightly Very Fine Gravelly Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	115.4
	SORTING:	37.26
	SKEWNESS:	26.49
	KURTOSIS:	1313.0
METHOD OF MOMENTS Geometric (μm)	MEAN:	108.3
	SORTING:	1.452
	SKEWNESS:	-5.124
	KURTOSIS:	39.29
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	3.206
	SORTING:	0.538
	SKEWNESS:	5.124
	KURTOSIS:	39.29
FOLK AND WARD METHOD (μm)	MEAN:	112.0
	SORTING:	1.206
	SKEWNESS:	0.237
	KURTOSIS:	1.175
FOLK AND WARD METHOD (Φ)	MEAN:	3.158
	SORTING:	0.270
	SKEWNESS:	-0.237
	KURTOSIS:	1.175
FOLK AND WARD METHOD (Description)	MEAN:	Very Fine Sand
	SORTING:	Very Well Sorted
	SKEWNESS:	Coarse Skewed
	KURTOSIS:	Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	91.92
	D_{50} (μm):	109.7
	D_{90} (μm):	151.5
	(D_{90} / D_{10}) (μm):	1.648
	(D_{90} - D_{10}) (μm):	59.54
	(D_{75} / D_{25}) (μm):	1.248
	(D_{75} - D_{25}) (μm):	24.34
	D_{10} (Φ):	2.723
	D_{50} (Φ):	3.188
	D_{90} (Φ):	3.444
	(D_{90} / D_{10}) (Φ):	1.265
	(D_{90} - D_{10}) (Φ):	0.721
	(D_{75} / D_{25}) (Φ):	1.105
	(D_{75} - D_{25}) (Φ):	0.319

SAMPLE: LB021	SAMPLE TYPE:	Unimodal, Moderately Sorted
	TEXTURAL GROUP:	Slightly Gravelly Muddy Sand
	SEDIMENT NAME:	Slightly Fine Gravelly Coarse Silty Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	116.8
	SORTING:	389.4
	SKEWNESS:	15.65
	KURTOSIS:	258.2
METHOD OF MOMENTS Geometric (μm)	MEAN:	69.49
	SORTING:	2.521
	SKEWNESS:	-1.117
	KURTOSIS:	6.633
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	3.847
	SORTING:	1.334
	SKEWNESS:	1.117
	KURTOSIS:	6.633
FOLK AND WARD METHOD (μm)	MEAN:	88.20
	SORTING:	1.661
	SKEWNESS:	-0.493
	KURTOSIS:	2.372
FOLK AND WARD METHOD (Φ)	MEAN:	3.503
	SORTING:	0.732
	SKEWNESS:	0.493
	KURTOSIS:	2.372
FOLK AND WARD METHOD (Description)	MEAN:	Very Fine Sand
	SORTING:	Moderately Sorted
	SKEWNESS:	Very Fine Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	31.68
	D_{50} (μm):	92.12
	D_{90} (μm):	119.4
	(D_{90} / D_{10}) (μm):	3.768
	(D_{90} - D_{10}) (μm):	87.68
	(D_{75} / D_{25}) (μm):	1.515
	(D_{75} - D_{25}) (μm):	36.84
	D_{10} (Φ):	3.067
	D_{50} (Φ):	3.440
	D_{90} (Φ):	4.980
	(D_{90} / D_{10}) (Φ):	1.624
	(D_{90} - D_{10}) (Φ):	1.914
	(D_{75} / D_{25}) (Φ):	1.187
	(D_{75} - D_{25}) (Φ):	0.600

SAMPLE: LB014	SAMPLE TYPE:	Bimodal, Very Poorly Sorted
	TEXTURAL GROUP:	Gravelly Muddy Sand
	SEDIMENT NAME:	Fine Gravelly Very Coarse Silty Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	1456.5
	SORTING:	3153.9
	SKEWNESS:	2.327
	KURTOSIS:	7.379
METHOD OF MOMENTS Geometric (μm)	MEAN:	140.6
	SORTING:	8.590
	SKEWNESS:	0.622
	KURTOSIS:	2.698
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	2.830
	SORTING:	3.103
	SKEWNESS:	-0.622
	KURTOSIS:	2.698
FOLK AND WARD METHOD (μm)	MEAN:	218.7
	SORTING:	8.715
	SKEWNESS:	0.418
	KURTOSIS:	2.516
FOLK AND WARD METHOD (Φ)	MEAN:	2.193
	SORTING:	3.124
	SKEWNESS:	-0.418
	KURTOSIS:	2.516
FOLK AND WARD METHOD (Description)	MEAN:	Fine Sand
	SORTING:	Very Poorly Sorted
	SKEWNESS:	Very Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	6800.0
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	-2.743
	MODE 3 (Φ):	
	D_{10} (μm):	15.83
	D_{50} (μm):	98.13
	D_{90} (μm):	6838.7
	(D_{90} / D_{10}) (μm):	432.0
	(D_{90} - D_{10}) (μm):	6822.9
	(D_{75} / D_{25}) (μm):	3.165
	(D_{75} - D_{25}) (μm):	147.6
	D_{10} (Φ):	-2.774
	D_{50} (Φ):	3.349
	D_{90} (Φ):	5.981
	(D_{90} / D_{10}) (Φ):	-2.156
	(D_{90} - D_{10}) (Φ):	8.755
	(D_{75} / D_{25}) (Φ):	1.751
	(D_{75} - D_{25}) (Φ):	1.662

SAMPLE: LB510	SAMPLE TYPE:	Unimodal, Poorly Sorted
	TEXTURAL GROUP:	Slightly Gravelly Muddy Sand
	SEDIMENT NAME:	Slightly Very Fine Gravelly Medium Silty Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	200.1
	SORTING:	463.0
	SKEWNESS:	6.758
	KURTOSIS:	62.31
METHOD OF MOMENTS Geometric (μm)	MEAN:	92.71
	SORTING:	3.039
	SKEWNESS:	-0.093
	KURTOSIS:	5.386
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	3.431
	SORTING:	1.603
	SKEWNESS:	0.093
	KURTOSIS:	5.386
FOLK AND WARD METHOD (μm)	MEAN:	99.96
	SORTING:	2.257
	SKEWNESS:	0.079
	KURTOSIS:	3.519
FOLK AND WARD METHOD (Φ)	MEAN:	3.323
	SORTING:	1.174
	SKEWNESS:	-0.079
	KURTOSIS:	3.519
FOLK AND WARD METHOD (Description)	MEAN:	Very Fine Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Symmetrical
	KURTOSIS:	Extremely Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	53.60
	D_{50} (μm):	97.06
	D_{90} (μm):	236.8
	(D_{90} / D_{10}) (μm):	4.419
	(D_{90} - D_{10}) (μm):	183.2
	(D_{75} / D_{25}) (μm):	1.595
	(D_{75} - D_{25}) (μm):	44.44
	D_{10} (Φ):	2.078
	D_{50} (Φ):	3.365
	D_{90} (Φ):	4.222
	(D_{90} / D_{10}) (Φ):	2.032
	(D_{90} - D_{10}) (Φ):	2.144
	(D_{75} / D_{25}) (Φ):	1.219
	(D_{75} - D_{25}) (Φ):	0.674

SAMPLE: LB512	SAMPLE TYPE:	Unimodal, Poorly Sorted
	TEXTURAL GROUP:	Slightly Gravelly Sand
	SEDIMENT NAME:	Slightly Very Fine Gravelly Very Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	189.9
	SORTING:	479.9
	SKEWNESS:	11.67
	KURTOSIS:	184.2
METHOD OF MOMENTS Geometric (μm)	MEAN:	94.85
	SORTING:	2.886
	SKEWNESS:	-0.197
	KURTOSIS:	5.649
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	3.398
	SORTING:	1.529
	SKEWNESS:	0.197
	KURTOSIS:	5.649
FOLK AND WARD METHOD (μm)	MEAN:	98.64
	SORTING:	2.152
	SKEWNESS:	0.031
	KURTOSIS:	3.591
FOLK AND WARD METHOD (Φ)	MEAN:	3.342
	SORTING:	1.106
	SKEWNESS:	-0.031
	KURTOSIS:	3.591
FOLK AND WARD METHOD (Description)	MEAN:	Very Fine Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Symmetrical
	KURTOSIS:	Extremely Leptokurtic
	MODE 1 (μm):	107.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	3.237
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	63.36
	D_{50} (μm):	99.02
	D_{90} (μm):	204.5
	(D_{90} / D_{10}) (μm):	3.227
	(D_{90} - D_{10}) (μm):	141.1
	(D_{75} / D_{25}) (μm):	1.554
	(D_{75} - D_{25}) (μm):	42.55
	D_{10} (Φ):	2.290
	D_{50} (Φ):	3.336
	D_{90} (Φ):	3.980
	(D_{90} / D_{10}) (Φ):	1.738
	(D_{90} - D_{10}) (Φ):	1.690
	(D_{75} / D_{25}) (Φ):	1.207
	(D_{75} - D_{25}) (Φ):	0.636

SAMPLE: LB515	SAMPLE TYPE:	Unimodal, Poorly Sorted
	TEXTURAL GROUP:	Slightly Gravelly Muddy Sand
	SEDIMENT NAME:	Slightly Fine Gravelly Very Coarse Silty Fine Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	252.6
	SORTING:	558.1
	SKEWNESS:	8.973
	KURTOSIS:	95.98
METHOD OF MOMENTS Geometric (μm)	MEAN:	128.5
	SORTING:	3.344
	SKEWNESS:	-0.944
	KURTOSIS:	4.834
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	2.960
	SORTING:	1.742
	SKEWNESS:	0.944
	KURTOSIS:	4.834
FOLK AND WARD METHOD (μm)	MEAN:	146.8
	SORTING:	2.407
	SKEWNESS:	-0.262
	KURTOSIS:	2.441
FOLK AND WARD METHOD (Φ)	MEAN:	2.768
	SORTING:	1.267
	SKEWNESS:	0.262
	KURTOSIS:	2.441
FOLK AND WARD METHOD (Description)	MEAN:	Fine Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Fine Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	152.5
	MODE 2 (μm):	
	MODE 3 (μm):	
	MODE 1 (Φ):	2.737
	MODE 2 (Φ):	
	MODE 3 (Φ):	
	D_{10} (μm):	38.10
	D_{50} (μm):	159.5
	D_{90} (μm):	331.2
	(D_{90} / D_{10}) (μm):	8.695
	(D_{90} - D_{10}) (μm):	293.1
	(D_{75} / D_{25}) (μm):	1.941
	(D_{75} - D_{25}) (μm):	105.8
	D_{10} (Φ):	1.594
	D_{50} (Φ):	2.648
	D_{90} (Φ):	4.714
	(D_{90} / D_{10}) (Φ):	2.957
	(D_{90} - D_{10}) (Φ):	3.120
	(D_{75} / D_{25}) (Φ):	1.436
	(D_{75} - D_{25}) (Φ):	0.957

SAMPLE: LB517	SAMPLE TYPE:	Trimodal, Poorly Sorted
	TEXTURAL GROUP:	Gravelly Sand
	SEDIMENT NAME:	Fine Gravelly Very Coarse Sand
METHOD OF MOMENTS Arithmetic (μm)	MEAN:	1997.6
	SORTING:	2459.7
	SKEWNESS:	2.430
	KURTOSIS:	8.709
METHOD OF MOMENTS Geometric (μm)	MEAN:	1033.8
	SORTING:	3.996
	SKEWNESS:	-1.639
	KURTOSIS:	7.500
METHOD OF MOMENTS Logarithmic (Φ)	MEAN:	-0.048
	SORTING:	1.999
	SKEWNESS:	1.639
	KURTOSIS:	7.500
FOLK AND WARD METHOD (μm)	MEAN:	1310.5
	SORTING:	3.033
	SKEWNESS:	0.108
	KURTOSIS:	2.258
FOLK AND WARD METHOD (Φ)	MEAN:	-0.390
	SORTING:	1.601
	SKEWNESS:	-0.108
	KURTOSIS:	2.258
FOLK AND WARD METHOD (Description)	MEAN:	Very Coarse Sand
	SORTING:	Poorly Sorted
	SKEWNESS:	Coarse Skewed
	KURTOSIS:	Very Leptokurtic
	MODE 1 (μm):	1200.0
	MODE 2 (μm):	4800.0
	MODE 3 (μm):	9600.0
	MODE 1 (Φ):	-0.243
	MODE 2 (Φ):	-2.243
	MODE 3 (Φ):	-3.243
	D_{10} (μm):	505.2
	D_{50} (μm):	1087.7
	D_{90} (μm):	5334.6
	(D_{90} / D_{10}) (μm):	10.56
	(D_{90} - D_{10}) (μm):	4829.4
	(D_{75} / D_{25}) (μm):	2.303
	(D_{75} - D_{25}) (μm):	1002.1
	D_{10} (Φ):	-2.415
	D_{50} (Φ):	-0.121
	D_{90} (Φ):	0.985
	(D_{90} / D_{10}) (Φ):	-0.408
	(D_{90} - D_{10}) (Φ):	3.400
	(D_{75} / D_{25}) (Φ):	-0.459
	(D_{75} - D_{25}) (Φ):	1.203

APPENDIX I. INFAUNAL DATA MATRIX

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
	CNIDARIA																		
D759	Edwardsiidae sp. indet		2	1							1								
	NEMERTEA																		
G001	Nemertea indet.	1							1	2	1			1	1			2	2
G039	*Cerebratulus* sp.										1								
	SIPUNCULA																		
N001	Sipuncula sp. juv./dam.							1											9
N017	*Golfingia vulgaris*								1	1									2
	ECHIURA																		
O001	Echiura sp.																		1
	ANNELIDA																		
P0015	*Pisione remota*																		1
P0019	*Aphrodita aculeata*									1									
P0025	Polynoidae indet. dam./juv.			1						1	1		1	1	2				1
P0049	*Gattyana cirrosa*		1						1		1							1	
P0050	*Harmothoe* sp. dam.				1														
P0068	*Malmgreniella marphysae*														2	1			
No number	*Malmgreniella arenicolae*																		1
P0082	*Lepidonotus squamatus*									5									
P0091	*Pholoe* sp. juv.																		1
P0092	*Pholoe inornata*	1				1				1									
P0094	*Pholoe* cf. *synophthalmica*									3	2					1		4	1
P0104	*Sigalion mathildae*															1			
P0106	*Sthenelais* sp.																		1
P0109	*Sthenelais limicola*																	1	1
P0114	Phyllodocidae sp. indet. Juv./dam.		3	1				1							1				
P0118	*Eteone longa*							1	1		1							2	
P0124	*Hypereteone foliosa*														1				
P0127	*Mysta picta*								1										

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
P0141	*Phyllodoce groenlandica*		1				1												
P0145	*Phyllodoce mucosa*																	5	
P0150	*Eulalia* sp. juv.	1	2								1								
P0155	*Eulalia mustela*			1															
P0164	*Eumida bahusiensis*										1		2	1					
P0167	*Eumida sanguinea*			1															
P0256	*Glycera alba*							1		2	1								
P0260	*Glycera lapidum*	2	9	1		2	2		7	1	1				3			2	2
No number	*Glycera unicornis*												1						
P0305	*Kefersteinia cirrata*			1															1
P0311	*Nereimyra punctata*									1									
P0319	*Podarkeopsis capensis*																	1	
P0346	Syllidae sp. indet. Juv.			1															
P0349	*Syllis cornuta*	1	1						5	1									22
P0362	*Trypanosyllis coeliaca*					1													
P0368	*Syllis hyalina*	3																	2
P0380	*Eusyllis blomstrandi*		1																
P0403	*Streptosyllis bidentata*	1																	
P0421	*Exogone hebes*	2																	
P0422	*Exogone naidina*						1												
P0424	*Sphaerosyllis* sp. juv.	2	1	2					2										1
P0425	*Sphaerosyllis bulbosa*	7	3	3		1													5
P0426	*Sphaerosyllis erinaceus*																		1
P0430	*Sphaerosyllis taylori*																		2
P0434	*Autolytus* sp.			1															
P0475	*Eunereis longissima*										2								
P0493	*Aglaophamus rubella*	1																	
P0494	*Nephtys* sp.							2			1				1		1		
P0495	*Nephtys assimilis*														1	2			
P0498	*Nephtys cirrosa*						2	2	2	3	1					1			
P0499	*Nephtys hombergii*							3			1						3	1	

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
P0502	*Nephtys kersivalensis*									3	1								
P0569	Lumbrineridae indet. Juv.							2		2			1	2	5	2			
P0579	*Lumbrineris gracilis*	1	6			2	1	2	1	6	61			3	28	4	2	6	2
P0638	*Protodorvillea kefersteini*		2																21
P0642	*Schistomeringos neglecta*																		3
P0672	*Scoloplos armiger*							1	3	4	2					2		2	
P0684	*Aricidea catherinae*						1									1			
P0718	*Poecilochaetus serpens*										1				1				
P0720	*Spionidae indet. Dam.*		1						1		1			1	1	1			
P0722	*Aonides oxycephala*					1													
P0723	*Aonides paucibranchiata*	1	1			2			5										
P0731	*Laonice* sp.		1																
P0733	*Laonice bahusiensis*		5	1															
P0734	*Laonice sarsi*					1													
P0754	*Polydora flava*						1												
P0771	*Pseudopolydora* sp.									1									
P0772	*Pseudopolydora antennata*													1					
P0788	*Spio armata* agg.		14						2										
P0789	*Spio decorata*							1			5				1			2	
P0794	*Spiophanes bombyx*						1	1			7		1	2	4	15	2	8	
P0796	*Spiophanes kroyeri*										1								
P0803	*Magelona* sp.											1							
P0805	*Magelona filiformis*											1		1					
No number	*Magelona johnstoni*											2	1						
P0822	Cirratulidae sp. dam/juv										3				1			4	
P0829	*Caulleriella alata*	1					1												
P0831	*Chaetozone zetlandica*		1																
P0834	*Chaetozone setosa*							1			1							5	
No number	*Chaetozone christiei*											5						7	
P0873	Flabelligeridae sp.										1								
P0877	*Diplocirrus glaucum*							1							1	1		3	

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
P0884	*Pherusa flabellata*									1									
P0919	*Mediomastus fragilis*		1						3	1	9								
P0921	*Notomastus latericeus*		1					3	4	3	18				11	1		8	
P0938	Maldanidae sp. indet. Dam.							2			1				6	2	1	2	
P0955	*Clymenura* sp. indet.							3							2				
P0964	*Euclymene oerstedii*		1					13	2					5	16	2		3	
No number	*Euclymene* sp. A							1							4	2			
P0999	*Ophelia borealis*						4												
P1014	*Ophelina acuminata*																	1	
P1026	*Scalibregma celticum*		1																
P1027	*Scalibregma inflatum*										2					1		3	
P1062	*Polygordius* sp.	1																	
P1090	Oweniidae sp.							1							1			3	
P1093	*Galathowenia oculata*															2			
P1098	*Owenia fusiformis*						1	2			2								
P1102	*Amphictene auricoma*							1			2								
P1107	*Lagis koreni*							1										1	
P1124	*Melinna palmata*							3			27				7	4		4	
P1125	Ampharetinae sp.													1	1	1			
P1133	*Ampharete* sp.									2	1			1				2	
P1139	*Ampharete lindstroemi*									4	3					2		2	
P1175	*Terebellides stroemi*										1								
P1190	*Eupolymnia nesidensis*									1	1				1				
P1195	*Lanice conchilega*								1		1							1	
P1217	*Pista cristata*		2						6										1
P1235	*Polycirrus* sp.						1		2	1						1	1		1
P1242	*Polycirrus medusa*					3	1		7	1					1				
P1257	Sabellidae indet. dam.		26	1															
P1279	*Euchone papillosa*		1																
P1289	*Jasmineira caudata*		15																
P1324	Serpulidae sp. Indet.									3									

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
P1340	*Spirobranchus lamarcki*		1	1	1	2				15	1				4				
P1341	*Spirobranchus triqueter*					2				45									
	Pycnogonia																		
Q0005	*Nymphon brevirostre*																	2	
	ARTHOPODA																		
	Amphipoda																		
S0098	Gammaridea indet. dam																		1
S0131	*Perioculodes longimanus*													1			1		
S0133	*Pontocrates altamarinus*								8										
S0137	*Synchelidium haplocheles*						2												
S0249	*Urothoe marina*								35										1
S0257	*Harpinia pectinata*							5			2			1	3			8	
S0413	*Atylus vedlomensis*		1	1				1	1										
S0423	*Ampelisca* sp. indet. Dam									2						1			
S0427	*Ampelisca brevicornis*							1			1				1			1	
S0438	*Ampelisca spinipes*			1															
S0440	*Ampelisca tenuicornis*							14	3	6	27				5	2		4	
S0456	*Bathyporeia pelagica*								1				5						
S0552	*Photis longicaudata*														3				
S0579	*Aora gracilis*														1				
S0588	*Leptocheirus hirsutimanus*			1					47										
S0611	*Crassicorophium crassicorne*							2	3									6	
S0651	*Pariambus typicus*													1		1			
	Tanaidacea																		
S1099	Tanaidacea sp.																	1	
S1142	*Tanaopsis graciloides*							1							2	3			
	Cumacea																		
S1194	*Bodotria arenosa*			1				2	1										
S1203	*Iphinoe trispinosa*												1						
S1208	*Eudorella truncatula*									1	1				1	1			
S1236	*Pseudocuma longicorne*															1			

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
	Decapoda																		
S1276	Decapoda indet. larvae			1						1									
S1445	Paguridae sp.									1					2				
S1445	Paguridae indet. larvae			1															
S1458	*Pagurus cuanensis*														1				
S1462	*Pagurus prideaux*					1													
S1509	*Ebalia tumefacta*		1																
S1580	*Liocarcinus depurator*									1									
	MOLLUSCA																		
	Polyplacophora																		
W0053	*Leptochiton asellus*		17	8	5	3				3									
	Gastropoda																		
W0161	*Gibbula tumida*				4	1													
No number	*Euspira nitida*									1			1			2	1	3	1
W0708	*Buccinum undatum*										1								
	Opisthobranchia																		
W1028	*Cylichna cylindracea*																	3	
W1038	*Philine aperta*												3						
	Bivalvia																		
W1568	*Nucula hanleyi*								5										
W1570	*Nucula nucleus*					2			3	49				6	2	10	1	14	1
W1595	*Nuculana minuta*			1															
W1688	*Glycymeris glycymeris*		1																
No number	*Monia squama*									7									
W1837	*Thyasira flexuosa*							3		5	6			6	5	10	3		
W1902	*Tellimya ferruginosa*																	5	
W1906	*Kurtiella bidentata*			1							3			2	4	7	1	14	
W1953	*Parvicardium scabrum*							2											
W1978	*Spisula subtruncata*										1								
W1999	*Ensis ensis*						1												
W2015	*Acropagia crassa*																		1

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
W2019	*Angulus fabula*			1								5	1			1			
W2049	*Gari tellinella*			2						1								1	
W2059	*Abra alba*	1		2				16		14	5			1	14	21		122	
W2082	*Abra prismatica*						1												
W2086	Veneridae sp.		2			1				1									
W2100	*Clausinella fasciata*			1															
W2104	*Timoclea ovata*		1		1	1													
W2128	*Dosinia lupinus*																	3	2
W2157	*Corbula gibba*							1											
W2231	*Thracia phaseolina*			1			1	4								4	1	10	2
W2247	*Lyonsia norwegica*										1								
	PHORONIDA																		
ZA002	Phoronidae sp. indet. Dam.		2																
ZA005	*Phoronis muelleri*							2											
	ECHINODERMATA																		
	Ophiuroidea																		
ZB124	*Ophiothrix fragilis*									1									
ZB148	Amphiuridae indet. sp.																	4	
ZB151	*Acrocnida brachiata*															1	1	18	
ZB161	*Amphipholis squamata*		4	11	1	8				1	2								
ZB165	Ophiuridae sp. indet. Juv.								1										
ZB166	*Ophiura* sp. indet. Juv.						2												
ZB168	*Ophiura albida*							5										1	
ZB170	*Ophiura ophiura*														1				
	Echinoidea																		
ZB193	*Psammechinus miliaris*									1									
ZB212	*Echinocyamus pusillus*			1															
ZB223	*Echinocardium cordatum*																	3	
	PISCES																		
ZG471	*Lebetus scorpioides*				1														
ZG591	*Solea solea*												1						

MCS	Taxa/species	Station #																	
		LB602	LB115a	LB115b	LB115c	LB306	LB001	LB316	LB211	LB202	LB206	LB016	LB017	LB021	LB014	LB510	LB512	LB515	LB517
	EPIFAUNA																		
	Hydrozoa																		
D0662	Actiniaria sp.		1	1															
	Cirripedia																		
R0074	*Balanus* sp.									P									
	BRYOZOA																		
Y0076	*Alcyonidium diaphanum*					P					P								
Y0187	*Flustra foliacea*	P	P																
Y0411	*Cryptosula pallasiana*			P						P									
Y0483	*Fenestrulina malusii*		P			P													
	TUNICATA																		
ZD002	Ascidiacea sp.								2										
ZD088	*Ascidia conchilega*																		1

P = Present but colonial, therefore not enumerated

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