FOREWIND

DOGGER BANK
TEESSIDE A & B

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Environmental Statement Chapter 12 Appendix B Tranche A Benthic Survey Report

Application Reference 6.12.2

Report for

Dogger Bank Offshore Wind Farm (Tranche A, Cable route and Nearshore)

Benthic Ecology Characterisation Survey

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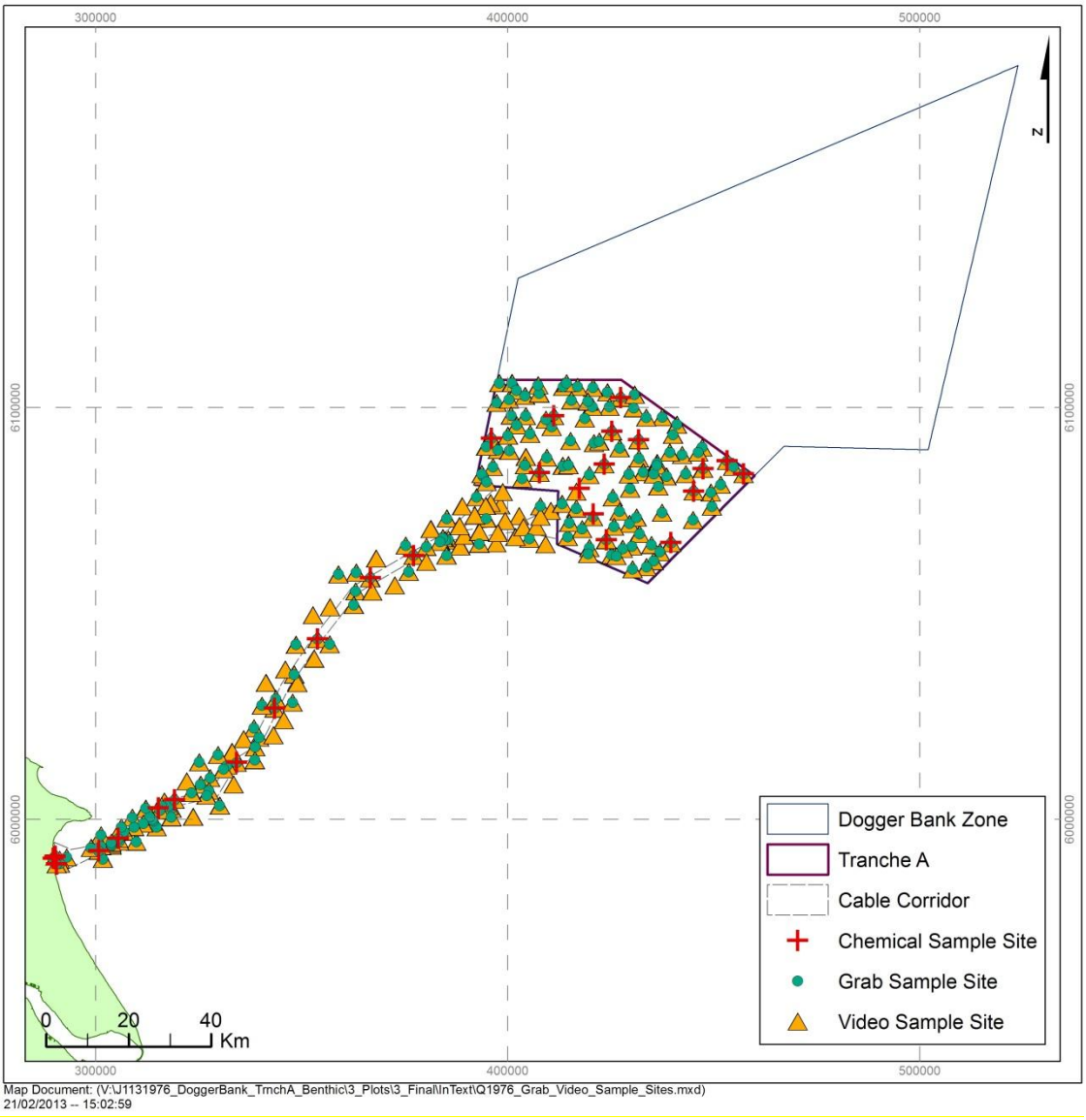
Introduction

The survey of the Dogger Bank Tranche A area and the associated export cable corridor was undertaken by Gardline Environmental Limited (Gardline) between 07/05/2011 and 30/01/2012. The specific objective of the project was to provide:

- Characterisation of benthic ecological conditions specific to the site within the Dogger Bank Offshore Wind Farm Zone (hereafter referred to as the Dogger Bank Zone) to inform the associated Environmental Impact Assessments (EIAs) for projects located within this Tranche.

The current report fulfils this objective through characterisation of the benthic ecological conditions. However, no characterisation employing geophysical data has been undertaken, with this report detailing results up to and including a statistical interpretation of the data. Biotope classification has been undertaken, taking into account the results of both geophysical survey and the ground truthing, via grab samples and drop down camera work reported in this document (see Envision, 2012).

The approach to survey design and sample location is described in Envision (2012). Details of survey methods and the field report have been completed by Gardline and are reported separately. Grab samples (for benthos, particle size analysis and contaminant analysis) and video sample locations are illustrated in the figure below and Chart 1 in the appendices.



Locations of grab, chemical and video sampling sites within Tranche A of the Dogger Bank Zone.

EMU Limited (EMU) completed the benthic sample identification, video transect analysis, sediment particle size analysis and all data analyses related to these components. Contaminants samples were analysed by NLS Analytical and were included in the data analyses completed by EMU.

Physical conditions

Three principal sediment types were identified across the region comprising:

- Sandy sites (classified using Folk (1974) as slightly gravelly sand and gravelly sand) with the most common particle size falling within the range of fine sand. These sites extended across both the Tranche A area and along the Export Cable Corridor;
- Gravelly sites (classified using Folk as sandy gravel and gravel) with the most common particle size falling within the fine gravel range. These sediments were found extensively across the Tranche A sites as well as in discrete areas of the nearshore export cable route; and

- Mixed sediment sites generally with notable proportions of mud (classified using Folk as muddy sandy gravel, gravelly muddy sand and slightly gravelly muddy sand). These sediments were found primarily in the Tranche A sites and in several of the nearshore sites along the export cable.

The depth conditions followed a clear trend with the central section of the export cable corridor existing in deep waters and most of the Dogger Bank sites, including the Tranche A and the nearshore sites, in shallow waters. There are a considerable number of bathymetric features around the western and southern edges of Tranche A, which correspond with the areas of coarse and mixed substrata. The mixture of coarse and mixed substrata with areas of sand, including sand waves evident from the geophysical survey data, suggests a high level of hydrodynamic influence. Admiralty charts indicate that tidal stream speed maxima for the Dogger Bank Zone are between 0.2 m/s and 0.6 m/s, with the higher speeds present in Tranche A, associated with the flow of water around the western edge of the Dogger Bank (EMU, 2010a), as described in Section 1.1.4. In contrast, the deeper water sands found along the export cable corridor appear to comprise relatively stable fine sands, which suggest lower levels of hydrodynamic disturbance.

Small outcrops of coarser sediment, including potential cobble outcrops have been identified from the video data. Output from these analyses need to be assessed in combination with geophysical survey interpretation to identify if any extensive areas of this substrate type exist and to determine whether these areas of cobbles represent potential Annex I cobble reef habitat. This process and the observed results are reported in Envision (2012).

Contamination

Numerous sites were identified where levels of contamination for one or more of the contaminants tested for were above either Cefas (Action Level 1) or OSPAR (Effects Range Low) quality guidelines. These related exclusively to metals levels, with all of the nearshore Export Cable Corridor sites sampled for contaminants plus site CABA_23 in the Export Cable Corridor having contaminant levels above Action Level 1 for several of the metals including Arsenic, Chromium, Lead and Nickel, the latter of which was also above the Cefas Action Level 2 and OSPAR, Effects Range Medium in the nearshore area. Several of the nearshore sites also supported raised levels of micro -organic pollutants, including C2 Naphthalene, at levels above the Action Level 1. The source of contamination at this site, however, is not evident from the data currently available.

Physical / biological relationships based on grab data

The current study confirms the range of community types anticipated from the Dogger Bank, within the Tranche A area. Much of the central area of Tranche A was dominated by both fine sands and mixed sediments, supporting a mixture of communities. The PRIMER analysis indicated that the sites within this area were within a continuum of species and communities, with several, more or less discrete groups evident. These groups corresponded with differences in the physical character of the area, ranging from predominantly sand areas, some of which appear to indicate a degree of instability, to sandy gravels and mixed sediments including sand and gravel with a significant proportion of silt.

From the analysis, the three main groups of sites derived within Tranche A indicated clear associations of fauna with the prevailing physical conditions. The coarse sandy gravels supported an association of

species comprising; *Polygordius* sp., *Protodorvillea kefersteini, Notomastus* sp., *Echinocyamus pusillus* and notably *Branchiostoma lanceolatum.*

The heterogeneous sediments supported a high diversity community relative to the other sites, including a variety of taxonomic groups, which are clearly exploiting the additional niches provided by the differing sediment types. The species that typified the sites included *Pomotoceros* spp., *Scalibregma inflatum* and *Mediomastus fragilis*, in combination with the bivalve *Mysella bidentata* (now *Kurtiella bidentata*).

The most extensively present group across Tranche A was comprised of a sand based community, with the sites dominated overall by *Spiophanes bombyx.* Several other species were characteristic of the sites, including *Bathyporeia elegans, Nephtys cirrosa, Magelona johnstoni* and *Fabulina fabula.* These species were present in a variety of combinations and it is evident that these formed part of a complex of communities. In general, the greatest levels of variety were evident on the banks of the Dogger Bank.

The Export Cable Corridor may be split into three distinct regions based on the cluster analysis. In general, the offshore segment of the Export Cable Corridor was similar to the main Tranche A area, falling substantially on the Dogger Bank. The community type was dominated by the combination of species found in Cluster i, with *B. elegans* and *Magelona johnstoni* most characteristic This same community type was also found at several locations in the inshore region, in addition to a significant area (cluster a) characterised by *Melinna elisabethae* and *Lumbrineris cingulate.*

Important with respect to potential conservation status, several areas of biogenic based habitats which can be illustrative of biogenic reef features, although not necessarily falling within the true definition of reef, were found in the nearshore areas of the Export Cable Corridor. These included those related to both *sabellaria spinulosa* and *Mytilus* spp. Determination of the status of these features as Annex 1 reef will require analysis of geophysical data (see Envision, 2012).

The remainder of the Export Cable Corridor was comprised of the sites that fell within the g cluster, characterised by burrowing echinoderms including *Amphiura filiformis.*

One small area of difference was evident between the seaward end of the Export Cable Corridor and Tranche A, where a small cluster of sites that were indicative of a deep water pocket of stable, sandy mud off the edge of the Dogger Bank were recorded.

Video interpretation

The interpretation of the video data and identification of habitat based communities has resulted in broadly similar conclusions to those reached for the grab sampling. The level of interpretation, however, is considerably less well refined compared to the grab sampling data, due to the relatively limited range of species that can be identified from video data and due to the inherently less diverse epifauna evident in what are essentially fine sediment habitats.

The overall community definition, however, confirms the occurrence of a deep water, fine sand based environment along the majority of the Export Cable Corridor. At either end of the Export Cable Corridor, a greater degree of habitat complexity was identified, with potential hard ground and cobble/boulder outcrop evident in the inshore areas (of this report), along with evidence of *Ophiothrix* beds. The complexity at the offshore end of the Export Cable Corridor corresponds with its arrival onto the Dogger Bank and is primarily related to the occurrence of more complex mixed and coarse sediments.

The top of Dogger Bank, within the Tranche A area, was primarily composed of fine sands interspersed, to the south and west, with mixed and coarse sediments, corresponding with the pronounced features on the geophysical data images. Greater consideration of these ecological data will be possible once the geophysical data has been fully interpreted.

Features of conservation importance

With regard to current nature conservation legislation two protected species were recorded and these were the ocean quahog and lesser sandeel. For the ocean quahog, as only a single juvenile specimen was found, it was thought that the conservation status of the species would not be affected by development. Though two specimens of the lesser sandeel were recorded, further speculation could not be made on the status of the population, as the sampling methodology was not sufficient to correctly record this mobile species.

1. INTRODUCTION

1.1. Study background

1.1.1. In 2010, Forewind Limited (Forewind), a consortium developer comprising SSE, RWE npower renewables, Statkraft and Statoil, was awarded exclusive development rights for the Dogger Bank Zone from The Crown Estate, through the third round of offshore wind farm leasing.

1.1.2. The Dogger Bank Zone is located within the UK Renewable Energy Zone (REZ), between approximately 125 and 290km offshore of the east coast of Yorkshire. The eastern boundary of the zone abuts the median line with Dutch waters, 220km from shore. The northern tip of the zone is adjacent to German waters, with Danish waters 14km to the north. The Dogger Bank Zone is 8,539km^2.

1.1.3. Depths range between 19 and 63m below Lowest Astronomical Tide (LAT). Sediments are described as a mixture of sands and gravels with areas of clayey sands.

1.1.4. Forewind is committed to develop 9GW in the Dogger Bank Zone by 2020. The first area for development, Tranche A, was identified in October 2010 (Figure 1.1), comprising approximately 2000km^2 in the southwest of the Dogger Bank Zone. This area was selected following a zonal desk-top characterisation report (EMU, 2010a) that was produced in 2010 (updated in 2011).

1.1.5. At the time of writing, it was assumed that Tranche A would hold three wind farm projects of up to 1.2GW each.

1.1.6. Forewind commissioned a series of benthic characterisation surveys of Tranche A and the proposed cable export route. EMU was commissioned to write the technical report which will feed into the Environmental Impact Assessment (EIA). Accordingly this document presents details of the survey methods used and the data collected; it then gives a characterisation of the subtidal benthic environment within and around the proposed development in terms of the seabed habitats available and their influence on associated biological communities.

1.2. Aims of the study

1.2.1. Study aims are broadly;

- Characterisation of benthic ecological communities based on benthic grab samples and video analysis, suitable for the production of baseline descriptions of the area and for inclusion in the EIA process.
- The studies comprising this assessment are intended to provide detailed consideration of the faunal and floral composition of the seabed in combination with available physical characteristics. The latter include data derived from particle size analysis and direct site by site observational data collected as part of the benthic grabbing process and the video observation studies. These data will contribute to determination of overall biotopes, to be provided in a supplementary report, which will include merging of the ecological, environmental and geophysical data, with the specific aim of identifying Annex 1 habitats, as well as provision of detailed maps of biotopes (see Envision, 2012).

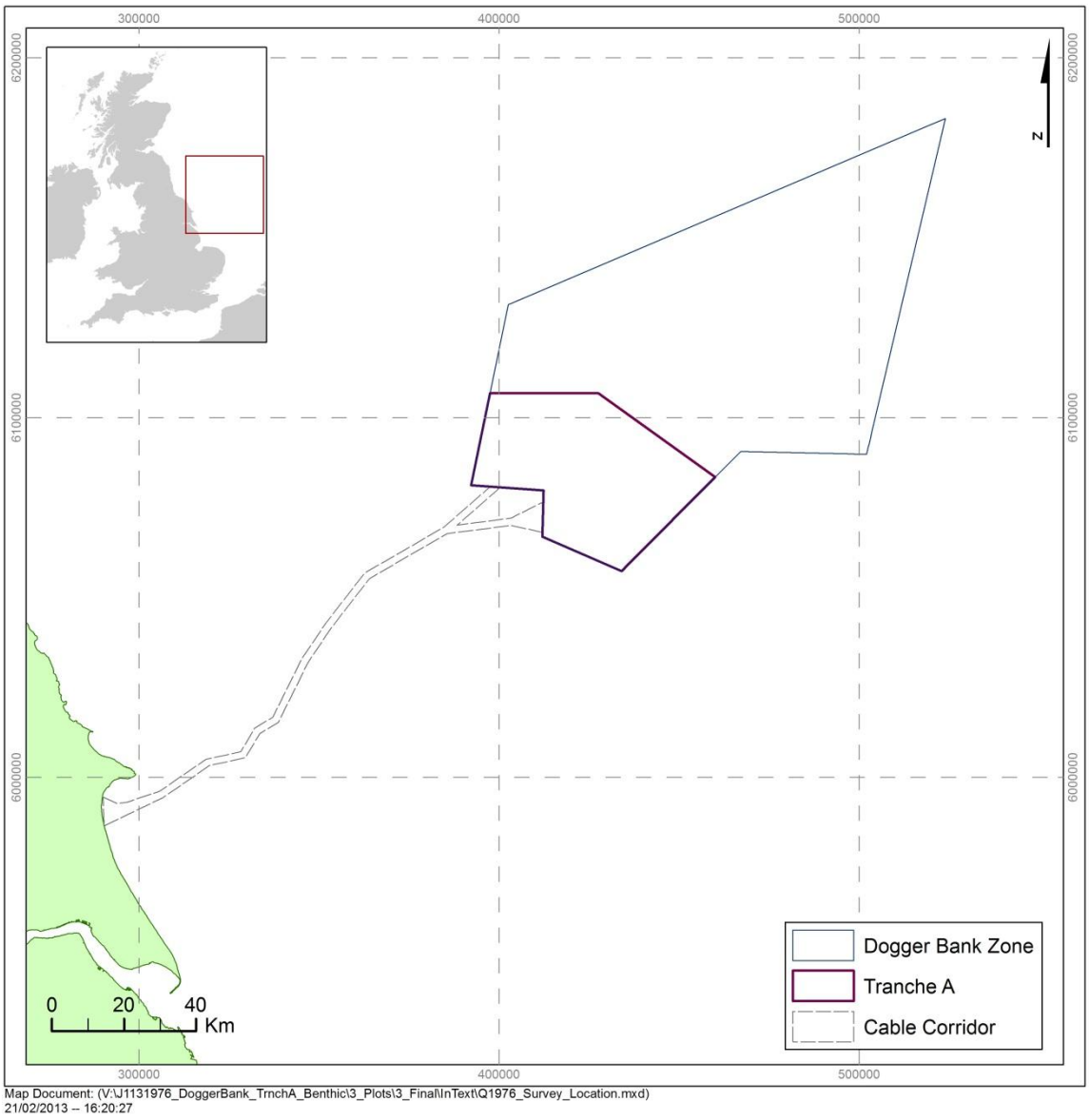


Figure 1.1 Location of survey area, Tranche A and Export Cable Corridor (source Forewind).

1.3. Study overview

1.3.1. Tranche A was selected as the first development area within the Dogger Bank Zone through the Zone Appraisal and Planning (ZAP) process. This process included a review of pre-existing environmental and commercial data in conjunction with selection workshops, to choose an area with a realistic probability of achieving a Development Consent Order (DCO) (considering environmental constraints identified through the ZAP process to date). The environmental section (as summarised within the Zonal Characterisation Document (ZOC), EMU, 2010a) covered all aspects that would be considered within an EIA, and thus included biological aspects such as benthic ecology, physical parameters such as sediment transport, and human attributes such as shipping or commercial fisheries.

1.3.2. This study is designed to build on the information collated within the ZoC by providing site specific data to inform the characterisation of Tranche A.

1.3.3. The benthic ecology discussed in the current study will be used to feed into the Environmental Statement (ES) that will form part of the application to the Infrastructure Planning Commission (IPC) for a DCO.

1.4. Regional physical environment

1.4.1. Physical information on the region is collated and summarised in the Dogger Bank ZOC (EMU, 2010a), which led to the Dogger Bank Recommendation for Tranche A report (Forewind, 2010).

1.4.2. The majority of Tranche A is within a depth range of 20 to 30 m LAT, but includes a small number of banks with localised depths of less than 20 m and one relatively small area in the southern corner with a localised depth of 30 to 40 m.

1.4.3. Tidal ranges are interpreted to be between 1 and 2 m across the Dogger Bank Zone, with those to the west (towards Tranche A) higher than those in the east. Tidal stream speed maxima for the eastern area of the Dogger Bank Zone are between 0.2 and 0.6 m/s. Higher speeds are present in the west, associated with the flow of water around the western edge of the Dogger Bank, (EMU, 2010a), as indicated by the presence of active sand bodies in the Sand Hills on Dogger Bank. Admiralty charts indicate that tidal stream speed maxima for the Dogger Bank Zone are between 0.2 and 0.6 m/s.

1.4.4. Bed forms around Dogger Bank are limited, with sediments ranging from gravels to mixtures of sands and gravels to clayey sands (EMU, 2010b); in addition, the tidal currents are complex (Belderson *et al.*, 1982).

1.5. Regional biological context

1.5.1. The Mapping European Seabed Habitat (MESH) project is developing seabed habitat maps for northwest Europe. The MESH study infers habitat types based on existing knowledge of relationships between main physical factors and selected hydrographic and biological data. The maps produced thus show predicted or modelled habitat type distribution; classification validation and boundary refinement is constantly undertaken through empirical field survey observation. The offshore area of Tranche A is broadly characterised by 'Infralittoral fine sand' or 'Infralittoral muddy sand', although the EUNIS classification of 'Infralittoral coarse sediment' is also common (Figure 1.2).

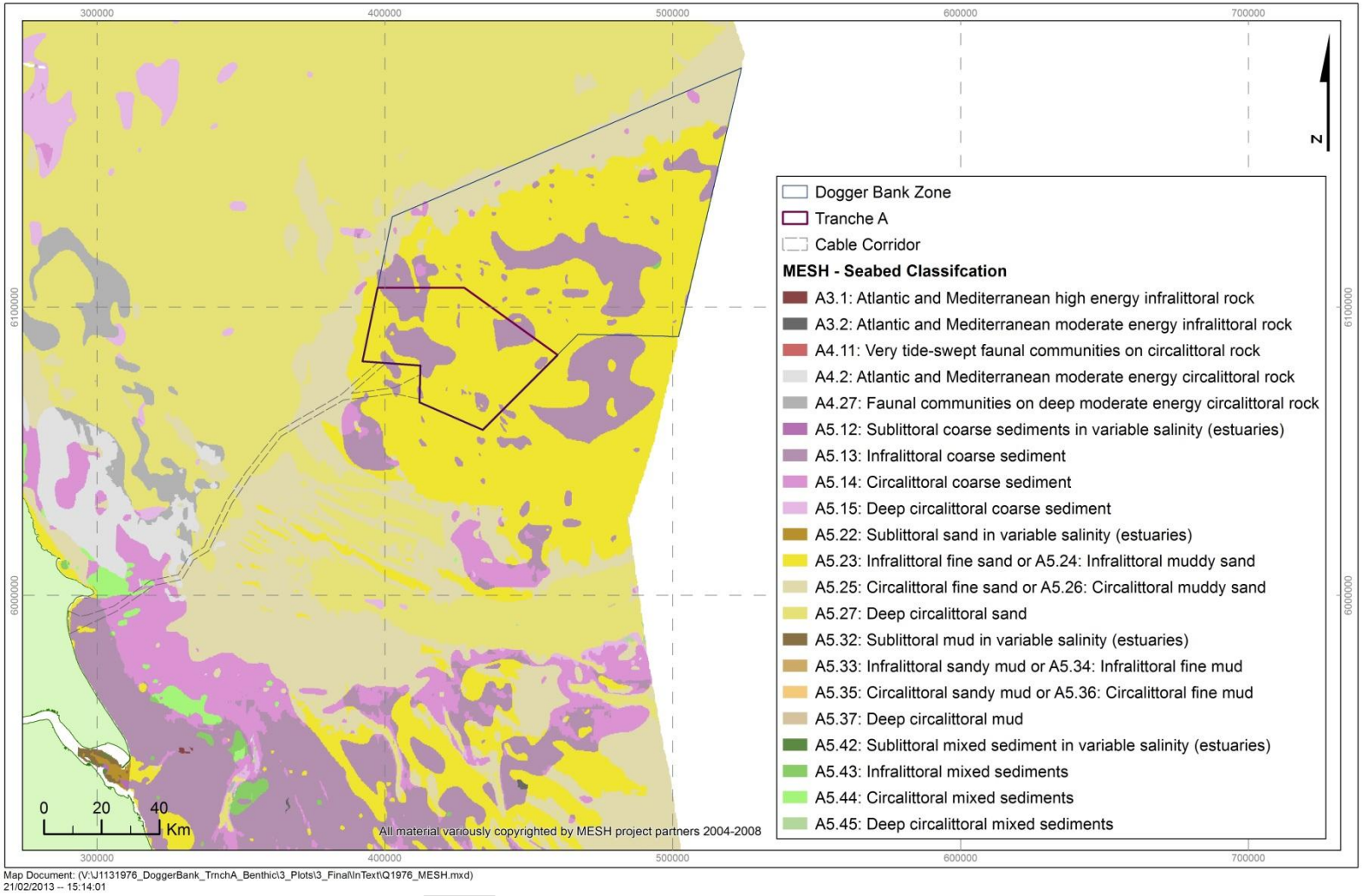


Figure 1.2 EUNIS habitat map in the vicinity of Tranche A and the proposed Export Cable Corridor.

1.5.2. A number of studies have broadly characterised the North Sea benthos and their associated habitats (Glémarec, 1973; Kröncke and Reiss, 2007; Rees *et al.*, 2007). The Dogger Bank Zone is within the southern North Sea and contains a variety of benthic community types associated with the strongly thermally-mixed waters resident all year round (EMU, 2010a).

1.5.3. Benthic surveys have being conducted at two discrete areas on the Dogger Bank in support of aggregate extraction applications. These included grab, trawl and seabed video surveys at Northwest Rough (Area 466) (EMU, 2002), in close proximity to the northern edge of Tranche A, and Southernmost Roughs (Area 482) (EMU, 2005). Data from these studies were used to characterise seabed habitats and communities to inform the respective EIAs.

1.5.4. Examination of samples which coincided with the Dogger Bank candidate Special Area of Conservation (cSAC), from a 2 m beam trawl survey conducted in the North Sea (Callaway, *et al.,* 2002), identified three variant and geographically distinct epibenthic communities. These were characterised by common starfish *Asterias rubens*, sand star *Astropecten irregularis*, hermit crab *Pagurus bernhardus*, infaunal brittlestars (*Ophuira* spp.), the green sea urchin *Psammechinus miliaris*, dab *Limanda limanda* and solenette *Buglossidium luteum*.

1.5.5. The dominant biotope associated with the Dogger Bank is SS.SSa.IFiSa.NcirBat (*Nephtys cirro*sa and *Bathyporeia* spp. in infralittoral sand) (EMU, 2010a) and appears to cover the majority of the Dogger Bank Zone, which may also include areas comprising more mixed sediment types based on habitat maps published in Diesing *et al*. (2009) as well as the EUNIS map. MarLIN (Budd, 2008) indicates with 'moderate' confidence that the sensitivity of this biotope to physical disturbance is 'very low'. In shallow and mobile sand communities, the fauna are adapted to natural sediment disturbance and mobility, and are characterised by highly fecund, short lived species capable of rapid recovery once disturbance ceases. This community type corresponds well with the 'Bank' community described by Wieking and Krönke (2001) which occupies the flat shallow seabed areas on top of the Dogger Bank and overlaps central and southern areas (e.g. the area of Tranche A) of the Dogger Bank Zone (EMU, 2010a).

1.5.6. Mixed heterogeneous substrates also support elevated diversity owing to the greater availability of micro-niches (EMU, 2002; 2005). The gravelly sand substrates in the northwestern region of the bank, adjacent to Tranche A, support the polychaetes *Glycera lapidum*, *Chone duneri*, *Aonides paucibranchiata*, *Nereis longissima* and *Pholoe balthica* (EMU, 2002; 2005). Isolated patches of mixed coarse sandy gravel and cobble substrata at the north west of the Dogger Bank supported the epifaunal brittlestar, *Ophiothrix fragilis* (SS.SMx.CMx.OphMx) which occurred in densities of up to 1,300 individuals/m^2 (EMU, 2002).

1.5.7. These communities are considered to be contained within the UK BAP habitat 'Subtidal sands and gravels'. This is the most common habitat found below the level of the lowest low tide around the coast of the United Kingdom (UK BAP see Maddock, 2008). It occurs in a range of environmental conditions, and the mix of sand or gravel, and any bedforms present on the surface of the seabed, depends on factors such as tidal and wave strengths. The Annex I habitat 'Sandbanks which are slightly covered by sea water all the time, designated under the cSAC of Dogger Bank (site code UK0030352), corresponds with this UK BAP habitat.

1.5.8. Site specific 2 m trawl sampling and seabed video surveying at North West Rough and Southernmost Rough (EMU, 2002; 2005) identified commonly occurring epibenthic species within the boundaries of

the cSAC. These included the soft coral, Dead Man's Finger *Alcyonium digitatum*, hermit crab *Pagurus bernhardus*, flying crab *Liocarcinus holsatus*, sand star, common starfish and dab; consistent with the wider array sampling completed by Callaway *et al*. (2002) and Jennings *et al*. (1999). Other species widely recorded during the site specific surveys included the long-clawed porcelain crab *Pisidia longicornis*, common whelk *Buccinum undatum*, green sea urchin, dragonet *Callionymus lyra* and gobies (EMU, 2010a).

1.5.9. The cSAC boundary (Figure 1.3) covers the majority of the Dogger Bank Zone, where the primary habitat interest feature of conservation importance is 'sandbanks that are slightly covered by sea water all the time'. In a global assessment, this feature was found to be Grade A, which means that, due to the extent of habitat and its representative communities and sediment type, it is considered of 'excellent conservation value' by the Joint Nature Conservation Committee (JNCC) (2010). Sandbanks in water depths of 20 m or less are protected although, where sandbanks extend below 20 m, these are included because they are integral to the interest feature and its Grade A designation (JNCC, 2010).

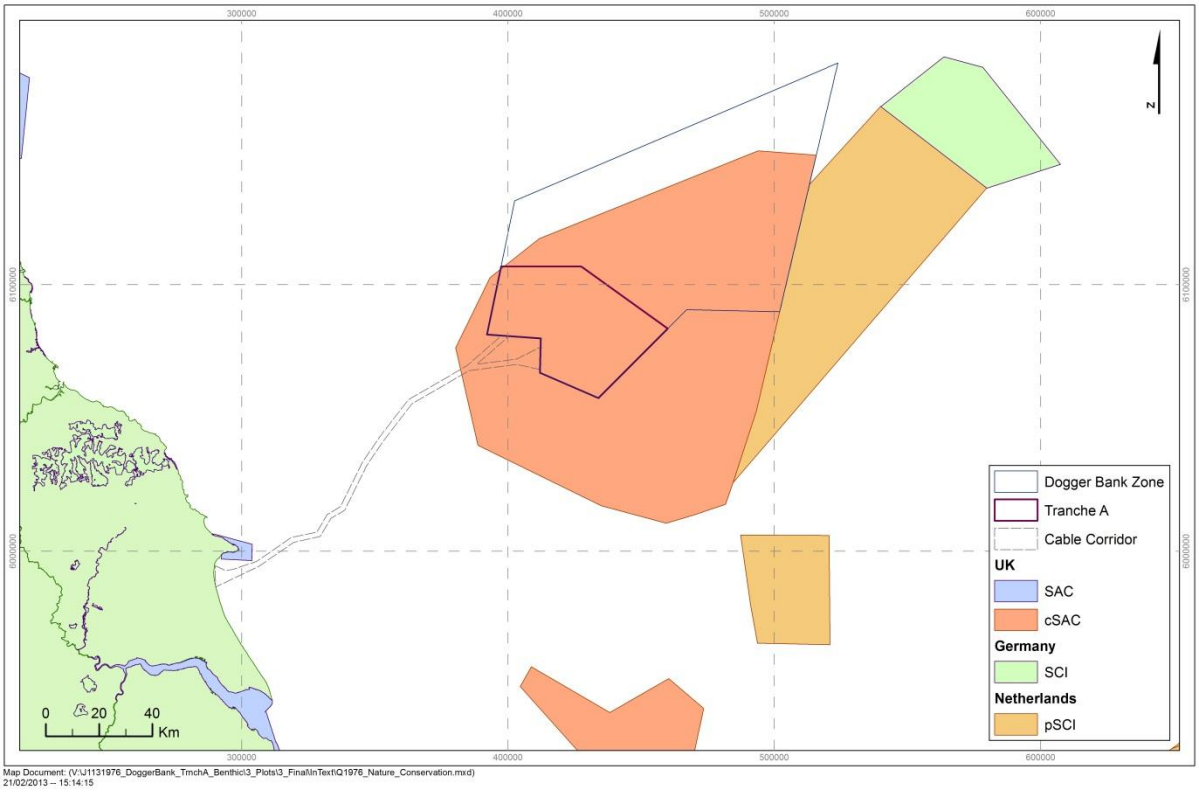


Figure 1.3 Location of Tranche A within the UK offshore cSAC.

2. METHODS

2.1. Survey design and sampling array

2.1.1. The subtidal survey was designed by Envision Mapping Ltd. and conducted by Gardline in 2011 in collaboration with Forewind, and consulted on with the Marine Management Organisation (MMO), the JNCC, the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and Natural England. The Tranche A and offshore Export Corridor survey was conducted between May-August 2011 on board the MV Vigilant and the nearshore export cable corridor survey during November 2011-January 2012 on board the MV Titan Endeavour. Gardline has provided full survey reports to Forewind detailing downtime, operational time, event diary, HSE performance and mobilisations for both survey dates. The relevant survey methodologies from this document have been presented in a reduced form below.

2.1.2. Summarised grab inventories, sample quality records, grab sample photographs and video logs from this survey are presented in Appendices I-III. Representative seabed photographs of sites are presented in Appendix IV. The survey sampling array is shown in Figure 2.1 below. This figure is also provided as an A3 size chart (Chart 1) in Appendix V. Chart 1 also details site nomenclature.

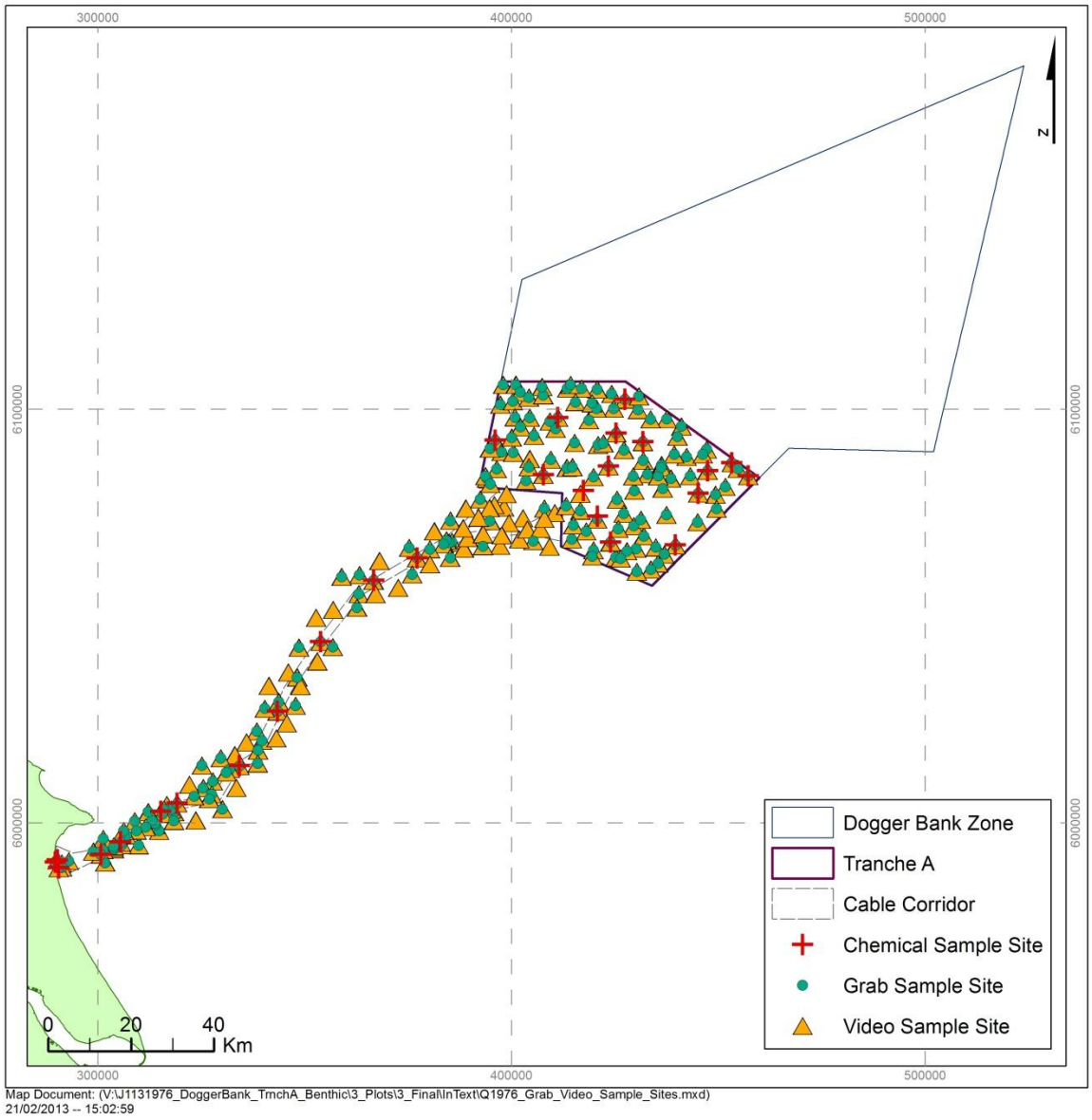


Figure 2.1 Benthic Sampling Array.

Camera procedure

2.1.3. Environmental seabed images were obtained using a Kongsberg 14-208 digital stills camera system with a dedicated strobe and video lamps, mounted within a stainless steel frame. An Ultra-short Baseline (USBL) positioning beacon was attached to the freshwater lens camera frame. Footage was viewed in real time via an umbilical, assisting in the control of the digital stills camera allowing for shot selection if a sediment change or feature was observed. A minimum of five seabed photographs were taken at each station using hover and drift technique, separated by a time gap of at least 10 seconds. The scale bar represents 1cm intervals.

2.1.4. The freshwater lens camera was lowered onto the seabed and a few seconds allowed prior to photograph capture, enabling disturbed suspended sediment between the camera and the seabed to disperse. This technique allowed the frame to move progressively along the seabed as the vessel

traversed the work area using thrusters, or drifting. Images were captured remotely using the surface control unit and stored on the camera's internal memory card. Video footage was overlaid with time, position and beacon depth, and recorded directly onto VHS video and DVD.

2.1.5. On completion, photographs were downloaded onto a PC via a USB download cable and copied onto CD-Rom. All CDs, DVDs and videos were labelled with the relevant job details, write-protected and stored.

Mini Hamon grab procedure

2.1.6. Benthic faunal and sediment samples were recovered using a modified, galvanised steel 0.1 m^2 Mini Hamon grab with a stainless steel bucket, constructed by Gardline. Methods used adhered to industry standard guidelines for benthic studies (Ware & Kenny 2011).

2.1.7. The grab was cleaned before sampling using a deck hose and seawater. A 300 m length of 13 mm, dry-core, galvanised steel cable was used to lower the grab to the seabed.

2.1.8. Faunal samples were placed in 1 litre polypropylene, screw-top, squat jars or 5 litre / 10 litre buckets and provided with an additional internal waterproof label. Sediment samples were placed in a plastic ziplock bag. All containers were labelled externally prior to use. When over the sampling station the grab was winched to the seabed and quickly recovered. Positional fixes were taken for each grab sample immediately following the grab reaching the sea floor, determined by observations of the tension on the winch cable. The grab offset of the vessel deployment was used to represent the position of the sampler. On recovery of a sample, the grab was examined for acceptability following strict Quality Assurance (QA) criteria. A grab sample was rejected and the instrument returned to the pre-deployment position if:

- Jaws jammed due to a large stone or shell allowing surface sediment washout;
- Half sample obtained where the grab had not struck a flat area of bottom, or not hit true, causing a side or half bite of sediment;
- Disruption of the sample by obvious shaking or contamination (these can occur when a sample is badly handled or if the grab strikes the side of the vessel during operations);
- The sample represented less than 5 litres of the grab's capacity or totally filled the grab (all weights removed if necessary);
- Sample was an unacceptable distance from the desired position (as determined by the on-board surveyors – initially no distance detailed so 50 m applied, 02/06/11 reduced to 20 m);
- The presence of a 'Hag Fish' and/or mucus coagulants; and
- The sample was unacceptable to the client representative.

2.1.9. Grab samples deemed acceptable for analyses were photographed and described prior to sub-sampling. Sediment colour was determined using Munsel colour charts, and assessed for acceptability. One subsample for PSA was taken directly from the tray. The volume of these subsamples followed BS1377 Part II methods, generally being between 500-1500g depending on the coarseness of the substrate. All PSA samples were stored at less than -18°C prior to analysis. The remaining sediment was then emptied into the 1 mm mesh sieve. Finer sediment fractions were washed from the sample using an auto-sieve, which sprayed a low powered seawater jet onto the

underside of the sieve. The residual sieve contents were photographed again and transferred to uniquely labelled sample jars using a scoop, making sure that none of the sample was lost or trapped in the sieve mesh.

2.1.10. Sieved samples were immediately fixed with 10% formalin (4% formaldehyde). The formalin in the sample pots was subsequently diluted to a concentration of approximately 4 to 5% by adding equal quantities of seawater to formalin. At the end of the survey, all of the retained samples were delivered to Gardline's Great Yarmouth office for sorting, checking and either storage or redelivery to their respective analytical sub-contractors.

Day grab procedure

2.1.11. Sediment chemistry samples were recovered using a modified, stainless-steel 0.1 m^2 Day grab constructed by Gardline. The grab carried extra weights to induce better penetration on impact and an extended bucket lip to reduce sediment washout. Storm feet and elastic straps were used to reduce the likelihood of the instrument pre-triggering in the water column during deployment.

2.1.12. The Day grab was washed using a weak detergent solution of Fairy liquid and a high pressure freshwater jet, followed by a thorough rinsing in freshwater prior to deployment at every station to prevent hydrocarbon cross contamination. The vessel's sampling area was pre-cleaned using a powerful deck fire-hose and freshwater.

2.1.13. All containers came ready to use, supplied by EMU, and were labelled externally prior to use. Chemistry samples were placed in 1 litre polypropylene containers, which were then placed into a zip lock bag and frozen immediately.

2.1.14. When over the sampling station, the grab was winched to the seabed and quickly recovered so that the sample could be obtained and the apparatus returned to the pre-deployment position. Positional fixes were taken for each grab sample immediately following the grab reaching the sea floor, determined by observations of the tension on the winch cable. The vessel offset of grab deployment was used to represent the position of the sampler. On recovery of a sample, the grab was examined for acceptability following strict QA criteria. A grab sample was rejected in the case of:

- Jammed jaws due to a large stone or shell allowing surface sediment washout;
- One or both of the bucket doors open on recovery, causing possible surface washout;
- Half sample obtained where the grab has not struck a flat area of bottom, or not hit true, causing a side or half bite of sediment;
- Disruption of the sample by obvious shaking or contamination;
- The sample represented less than 40% of the grab's total capacity. This was revised to allow accepting 30% capacity, where only one sub-sample was taken and a second drop being made for the remaining sub-samples, (i.e. less than 6 litres) or totally filled the grab (all weights removed if necessary);
- Sample was an unacceptable distance from the desired position (as determined by the on-board surveyors – acceptable position of 20 m from target location);
- The presence of a 'Hag Fish' and/or mucus coagulants; and
- The sample was unacceptable to the client representative.

2.1.15. Grab samples deemed acceptable for physico-chemical analyses were photographed and described prior to sub-sampling. Sediment colour was determined using Munsel colour charts. Surficial (<2 cm depth) sediments were taken directly from the Day grab for physicochemical analysis. Three sediment samples were taken at each station. These consisted of: a 300 g sample for PAH's and C1 to C5; a 300 g sample for metals; and a 100 g sample for total organic carbon, as a minimum. These samples were scooped using a polypropylene scoop into the 1 litre polypropylene containers. All physico-chemical samples were placed in a freezer immediately after sub-sampling and stored at less than -18°C prior to analysis. At the end of the survey, all of the retained samples were delivered to Gardline's Great Yarmouth office for sorting, checking and either storage or re-delivery to their respective analytical sub-contractors.

2.1.16. The subsequent sediment and macrofaunal laboratory analyses were undertaken by EMU as described below.

2.2. Laboratory methods

Particle size distribution (PSD) analysis

2.2.1. PSD analysis was undertaken at EMU's UKAS accredited sediment laboratory using in house methods based on BS1377: Parts 1 – 3: 1990 (dry sieving), and BS13320: 2009 (laser diffraction). The latter method was used when the fine fraction of sediment (<63 µm) comprised >5% of the total sample by weight.

2.2.2. Representative sub-samples of each sediment sample were oven dried to constant weight at 105 ±5°C before routinely wet sieving to remove silt and clay-sized particles of <63 µm (unless there was no sample cohesion after drying, where dry sieve analysis only is undertaken). The remaining coarser material was again oven dried to constant weight at 105 ±5°C, followed by dry sieving through a series of mesh apertures corresponding to 0.5 phi units, as described by the Wentworth scale (Holme and McIntyre, 1984). The weight of the sediment fraction retained on each mesh was subsequently measured and recorded and merged with the laser diffraction data where appropriate.

Loss on ignition

2.2.3. The method is based on BS1377: 1990 Part 3 Clause 4.1. The procedure determined the proportion of organic matter, by mass, which was lost from a soil by ignition at a specified temperature.

2.2.4. A representative sub-sample was oven dried at 50 ±5°C and weighed to constant mass. The sample was then subjected to ignition in a muffle furnace at 480 ±5°C for 4 hours. The organic matter content was then calculated from the subsequent loss in mass.

Contaminants analyses

2.2.5. Samples for contaminants analyses were sub-contracted to an experienced UKAS accredited chemistry laboratory. All tests were undertaken to relevant standards, and results certificates are provided as part of Appendix VII. Results certificates include method references. Results were compared, as available, with Cefas (2003) Action Levels and OSPAR Effects Range Low (ERL) and Effects Range Medium (ERM) levels.

2.2.6. Cefas Action Levels are non-statutory levels developed to inform decisions on the disposal of dredged material at sea. Materials with measured values below Cefas Action Level 1 (AL1) would be unlikely to be refused sea disposal licence on the ground of contamination. Values below this level are considered to have very low levels of anthropogenic contamination. Materials with contamination levels above Cefas Action Level 2 (AL2) are likely to be deemed unacceptable for sea disposal and levels between AL1 and AL2 would require further consideration and testing before a decision was made in this respect (Cefas, 2003).

2.2.7. Contaminant concentrations in sediment samples were also compared to the OSPAR ERL and ERM levels set by the Clean Seas Environment Monitoring Programme (CSEMP), the mechanism through which the UK fulfils its commitments to OSPAR. ERLs and ERMs were developed by the United States Environmental Protection Agency (EPA) for assessing the ecological significance of sediment contaminant concentrations. It is considered that concentrations below the ERL rarely cause adverse effects in marine organisms; however, concentrations above the ERM will often cause adverse effects in some marine organisms (OSPAR, 2009).

Macrofaunal analyses

2.2.8. The macrofaunal analysis was undertaken at EMU's marine laboratories. EMU is a long term participant of the National Marine Biological Association Quality Control (NMBAQC) scheme. Upon receipt, the samples were re-sieved over a 1 mm mesh to remove all remaining fine sediment and fixative. Macrofauna were sorted from the sediment by elutriation and the resulting light sediment residue and fauna were sorted by hand under a binocular microscope.

2.2.9. Macrofauna collected from the grab samples were identified to species level, where possible, and enumerated. Colonial, encrusting epifaunal species were allocated a P (present) value. A faunal reference collection was prepared with one individual of each species identified retained.

2.2.10. EMU undertook QC checks on a representative number of whole samples, as well as the entire reference collection in compliance with internal analytical QC criteria.

2.2.11. Faunal biomass analysis was based on a wet-blot method with estimates of ash-free dry weight made based on conversion factors indicated by (Eleftheriou and Basford, 1989) and provided below in Table 2.1.

Table 2.1 Conversion Factors for ash-free dry weight data

Polychaeta :	15.5 %
Crustacea :	22.5 %
Echinodermata :	8.0 %
Mollusca :	8.5 %
Others :	15.5 %

2.3. Data analyses

2.3.1. The macrofaunal community structure and sediment distributions were investigated by employing a number of univariate and multivariate statistical measures drawn from the Plymouth Marine Laboratories PRIMER v6 (Plymouth Routines in Multivariate Ecological Research) suite of programs (Clarke and Gorley, 2006; Clarke and Warwick, 2001).

2.3.2. Data were cleansed by amalgamating potentially spurious species identifications to a higher taxonomic level. These data were then imported into PRIMER and initially subjected to transformation using a square root transformation. The macrofaunal data were then subjected to hierarchical clustering to identify sample groupings based on the Bray-Curtis index of similarity. This process combines samples into groups, starting with the highest mutual similarities and then gradually lowers the similarity level at which groups are formed. The process ends with a single cluster containing all sites and is best expressed as a dendrogram diagram showing the sequential clustering of sites against relative similarity.

2.3.3. The MDS (Multi-dimensional Scaling) procedure uses the same similarity matrix as that used by the cluster analysis to produce an ordination of sites that is, in mathematical terms, multi-dimensional (Table 2.2). This attempts to satisfy all of the between-samples relationships indicated by the similarity matrix. This multi-dimensional ordination is then reduced to a two dimensional (2D) representation that is a more accessible and useable representation. The representativeness of this 2D version, in comparison to the multi-dimensional array, is indicated by a stress level. The closer this stress level is to zero, the better the representation.

2.3.4. Particle Size Analysis (PSA) data for percentage of sediment in each size fraction and Folk (1974) classification were also analysed using PRIMER. Data were initially investigated in an untransformed format, but subsequently, when combined with the faunal data, the PSA data and other physical data were subject to normalisation. Sediment data were taken from analysed grab samples collected from the Tranche A area and Export Cable Corridor locations. Data analysis outcomes have been mapped using Geographical Information System (GIS) to allow consideration of sediment distributions in the offshore and cable sites and in relation to predicted MESH habitats (see: http://jncc.defra.gov.uk/page-5534).

2.3.5. Analysis of sediment data comprised the following steps:

- Cluster grouping based on Euclidean (straight line between two points) distance combined with Nonmetric Multidimensional Scaling (nMDS); and
- Overlay of specific PSA fractions to identify importance of these fractions to the separation of the clusters, based on sediment composition.

2.3.6. Faunal data analysis followed a similar process but with the addition of a similarity percentage (SIMPER) analysis stage, once final faunally based site clusters had been identified. This process enables identification of species contributing to within group similarity and between group dissimilarity, enabling a description of community distinctiveness, including identification of characterising taxa. This information is useful for matching with the Marine Habitat Classification System to assign biotopes.

2.3.7. The final stage of analysis involves linking the physical data with the biological data such that the influence of different sediment fractions influence or correspond to faunal differences. Techniques employed include Principal Components Analysis (PCA) and BIOENV.

Table 2.2 Summary of test routines undertaken in PRIMER.

Analysis	Description
Hierarchical Cluster Analysis	Cluster analysis aims to find, where possible, 'natural groupings' of samples with similar physical (sediment) or faunal characteristics. The most commonly used clustering techniques are the hierarchical agglomerative methods. These start with a similarity matrix and 'fuse' the samples into groups and the groups into larger clusters, starting with the highest mutual similarities then gradually lowering the similarity level at which groups are formed until all of the samples are contained in a single cluster. The results of hierarchical clustering are represented by a tree diagram or dendrogram, with the x axis representing the full set of samples and the y axis representing the similarity level at which the groups are considered to have fused.
Multidimensional Scaling (MDS) Ordination	This technique allows the construction of a 'map' or configuration of the samples in multidimensional space. This configuration attempts to position the samples as accurately as possible to reflect similarity. For example, if sample 1 has a greater similarity to sample 2 than it does to sample 3, it will be displayed more closely to sample 2 than sample 3. This 'map' of the relative similarities is plotted in two dimensions. It is important to remember that this 2D plot is a representation of a multidimensional picture. When large sample numbers are analysed, or datasets including highly differentiated samples, the accuracy of the two-dimensional plot may be reduced. An accuracy measure (stress) is given on the MDS plot. Stress values <0.1 correspond to a good ordination; values <0.2 give a useful 2D picture, but one should not place too much reliance on the fine details of the plot; stress >0.3 indicates that the samples are close to being positioned in an arbitrary manner and should not be regarded as necessarily similar to one another, particularly in the upper half of this range.
The SIMPER Routine	The SIMPER routine allows the comparison between groups of samples from one site to another to be made. Species (or particle size fractions) responsible for the dissimilarity between the two sites are then listed in decreasing order of importance in the discrimination of the two regions. This routine also provides information on which species are responsible for the within-site similarities and their contribution to the internal similarity of the group.
The SIMPROF Routine	Test for structure in the data. First a resemblance profile is determined by ranking resemblances matrix for the data. A mean profile is then calculated by randomising the order of each variables values and recalculating the profile. The pi statistic is calculated as the deviation of the actual data profile with the mean one. This is compared with the deviations of further randomly generated profiles to test for significance.

Analysis	Description
BIOENV	BIOENV was used to assess the abiotic environmental variables (depth and sediment variables) which best matched the observed clustering of faunal samples following Bray-Curtis and/or MDS. It identifies a subset of environmental variables which are likely to be important drivers behind the observed multivariate faunal patterns seen in the data. However, BIOENV cannot inform the analyst of any missing drivers and as with any correlation does not imply causation, just potential causation.
Principal Component Analysis (PCA)	PCA is a multivariate statistical technique used to investigate variability in environmental data through the ordination of the results of sediment analyses. The analysis identifies a reduced set of 'principal components' that account for most of the variance of the original variables.

2.4. Video analysis

2.4.1. The seabed digital video footage was reviewed on EMU's office video editing suite to identify and describe the characterising habitat types and associated epifauna for each transect. In addition, for detailed analysis, a series of seabed images were selected that best represented habitat and community conditions at that station. These images were scored for species occurrence to enable assessment of epibenthic communities. All substrate and faunal data were subsequently used to classify the biotopes present along each transect as shown in Appendix VI.

2.4.2. Although a scale bar is included in each image abundance values were not employed, with fauna and flora recorded on the basis of presence only while notes were made on sediment composition including abbreviated sediment description and a more extended habitat description.

2.5. Video Data

2.5.1. Biotope code allocations were made using the current UK Marine Classification System v4.05 (Connor *et al*., 2004). Biotopes were allocated to faunal groupings produced from the PRIMER analysis employing the SIMPER outputs for guidance.

2.5.2. Choice of biotope was made using the biotope decision making tool BioScribe (Hooper *et al*., 2011). The BioScribe tool matches the species list from a sample to the biological communities usually recorded with potential biotope matches. Confidence indicators and direct links to habitat descriptions from the Marine Habitat Classification for Britain and Ireland are provided to facilitate the process. The tool was used by an experienced ecologist practiced in matching UK biotopes to field survey data with codes applied through expert judgment based on the BioScribe outputs and knowledge of the current biotope classification system.

2.5.3. The distribution of biotopes derived from the video data analysis have not been included within this report, as these will be integrated with geophysical data to provide a broadscale map of the area to be supplied as a standalone report.

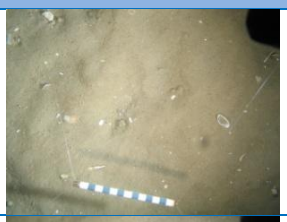
3. RESULTS

3.1. Seabed sediments

3.1.1. Full results of the particle size distribution analyses are presented in Appendix VII. Table 3.1 summarises the Folk sediment classifications found (Folk, 1974) with example images. Figure 3.1 illustrates the distribution of the three principal sediment components over the seabed area. This figure is also provided as an A3 size chart (Chart 2) in Appendix V.

Table 3.1 Summary of the grab sample sediment data.

Folk sediment classification	Number of stations (n=171) sediment composition	Representative photograph of grab sample
Gravel (G)	4	
Gravelly muddy sand (gmS)	1	
Gravelly sand (gS)	16	
Muddy sandy gravel (msG)	15	
Sand (S)	2	
Sandy gravel (sG)	16	

Folk sediment classification	Number of stations (n=171) sediment composition	Representative photograph of grab sample
Slightly gravelly sand (g)S	115	
Slightly gravelly sandy mud (g)sM	1	
Gravelly Mud (gM)	1	

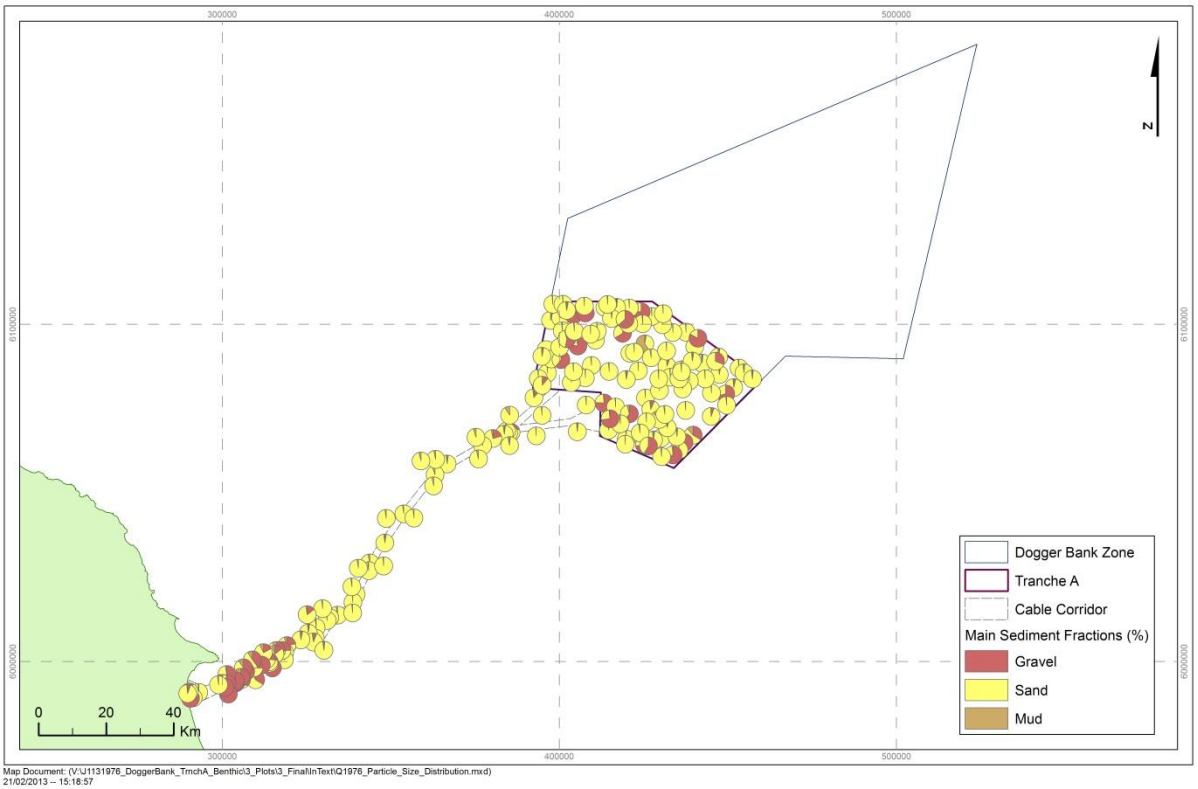


Figure 3.1 Distribution of the principal sediment components in the area surveyed.

3.1.2. The dominant sediment fraction was sand, comprising greater than 90% of the sediment in over 82% of sites. The sands were primarily comprised of fine sands with small amounts of medium sand. On average, the fine sand sediment fraction accounted for 65% of the weight of the samples collected

with peak values in the order of 94% of the sample, while medium sands accounted for 11% of the samples on average, with a maximum percentage fraction of 60%. Although accounting for less than 10% on average of the samples, gravel was found to contribute a maximum of 89% of the sediment at one site within Tranche A (TA_Grab_064). Muds contributed very little to the overall sediment composition, with an average value of less than 2.5%, although a maximum of 60% was found at one site (TA_Grab_058 in Tranche A), which was primarily composed of clay.

3.1.3. Figure 3.1 illustrates the distribution of these sediments, with the clearly sandy nature of most sites evident. Quite distinct regions, where the gravel component was greater, are illustrated in and around the periphery of Tranche A and in the sites close inshore on the cable route. The one high mud content site was located centrally in Tranche A. The cable route can be seen to comprise of relatively uniform sandy sediments over most of its length, with gravels and muds particularly found in the inshore areas.

3.1.4. Cluster analysis of the PSD grab data indicated that there were three separate sediment groups based on broad sediment classification (Figure 3.2 - this nMDS plot provides an illustration of the similarity between samples based on sediment compositions – close is very similar – distant is dissimilar). Investigation of raw data indicated that clusters were broadly based on differences in sediment composition of three key sediment components. Examples of these are illustrated in Figure 3.3 and comprise of medium sand in group c (Figure 3.3a), fine gravel in group d (Figure 3.3b), with the largest group, e characterised by fine sands (Figure 3.3c). The outlier sites in cluster a comprised very coarse gravels, while b was composed of coarse sand.

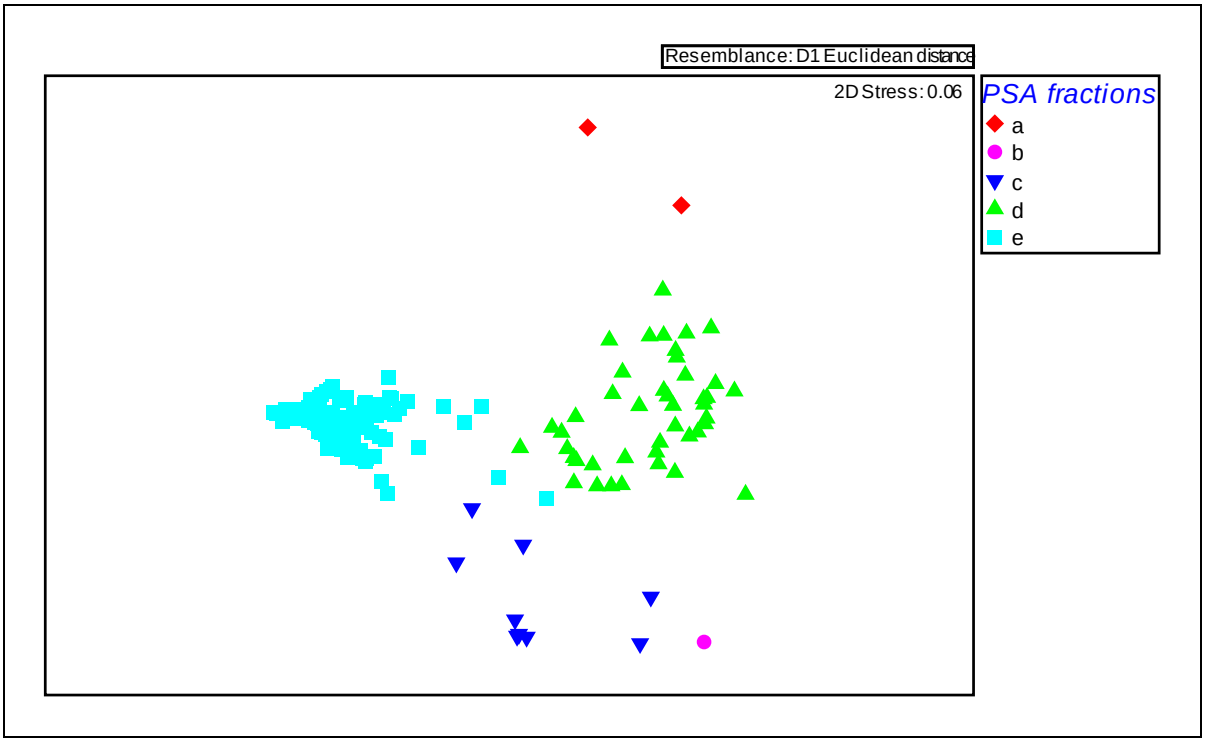


Figure 3.2 nMDS Cluster plot of sediment groups based on 0.3 (Euclidean distance) slice.

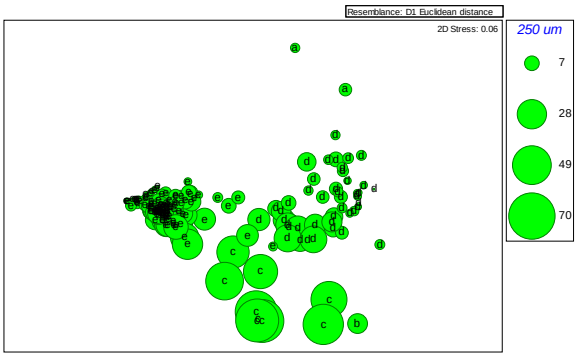


Figure 3.3a Proportion of medium sand overlaid on the nMDS of sediment clusters.

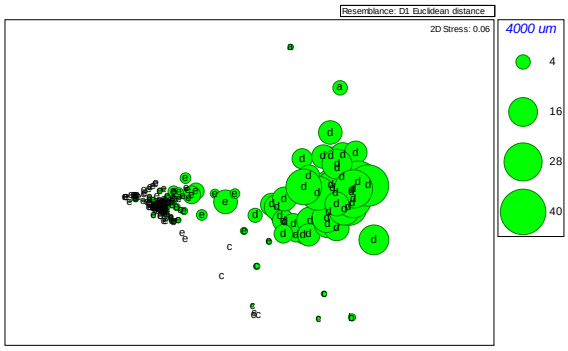


Figure 3.3b Proportion of fine gravel overlaid on the nMDS of sediment clusters

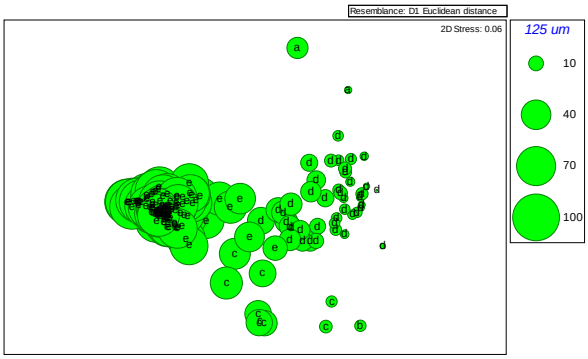


Figure 3.3c Proportion of fine sand overlaid on the nMDS of sediment clusters.

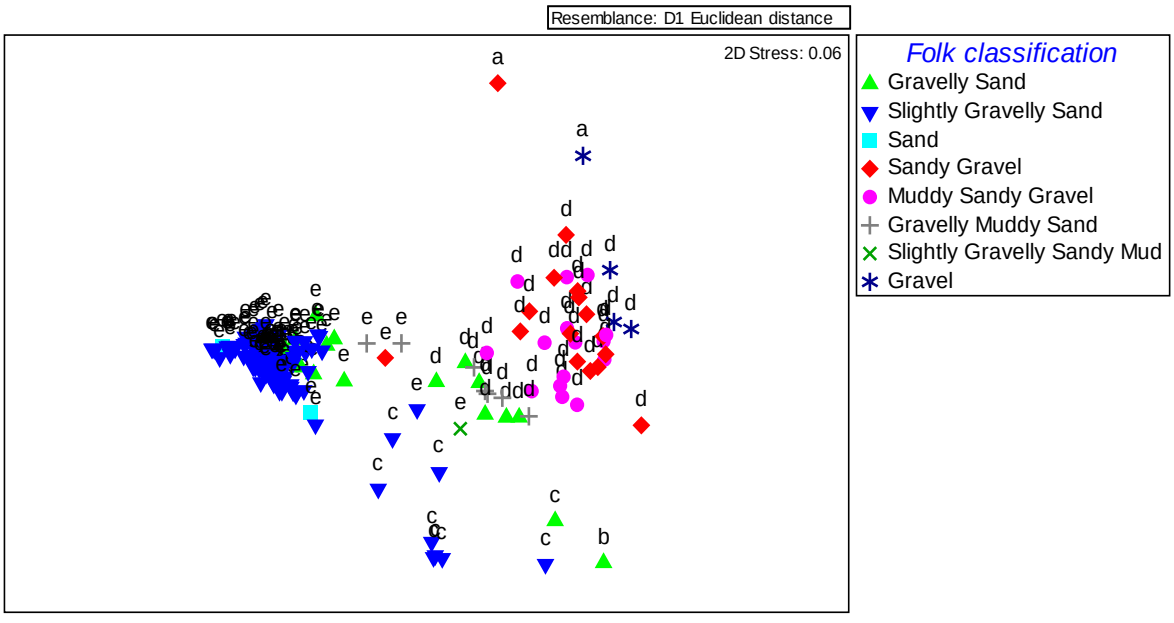


Figure 3.4 Folk classification for all sites overlaid onto the nMDS of the sediment data.

3.1.5. In terms of the Folk groups defined for each site, it is evident that sites from cluster e and c were almost exclusively slightly gravelly sand (Figure 3.4), while most of those from cluster d were defined

as sandy gravel and muddy sandy gravel, with several gravelly sand and exclusively gravel sites also evident.

3.1.6. With respect to the distribution of these sediment groups, Figure 3.5 illustrates that the coarse sediment cluster d sites were found in the Tranche A sites and the nearshore (NS) cable route sites. The cluster e sites, which were largely sand based were found in both Tranche A sites and along the remainder of the cable route. The medium sandy sediments of cluster c were found in sites across both Tranche A and the whole of the cable route.

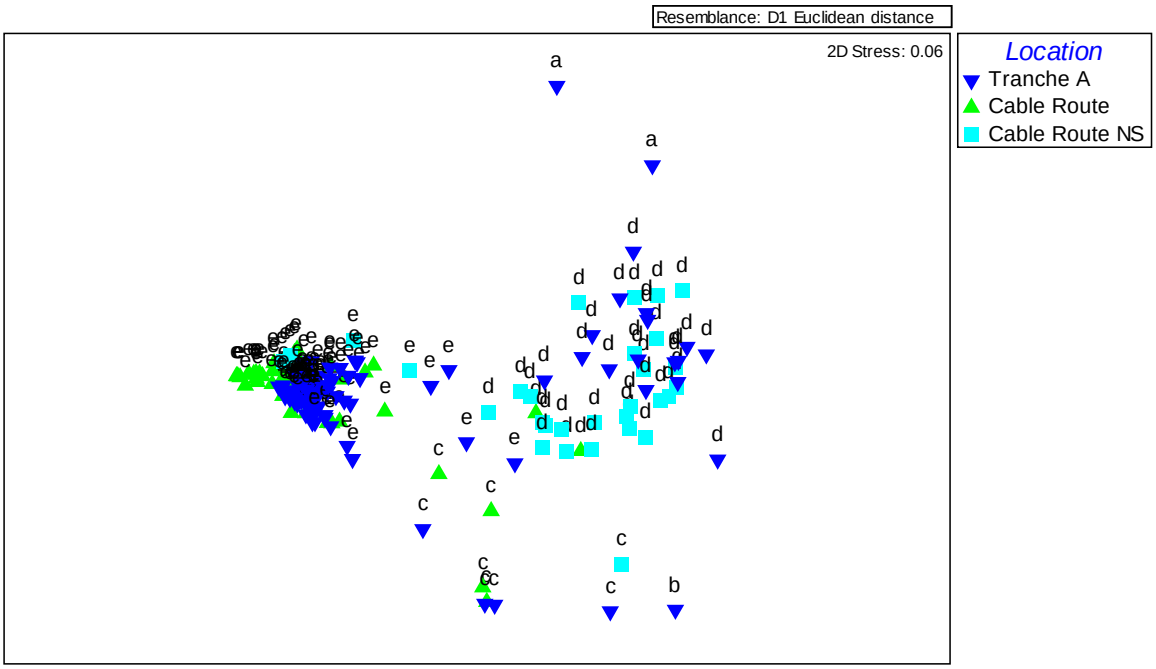


Figure 3.5 Location of sample sites, overlaid onto the nMDS of the sediment data.

3.2. Contaminants

3.2.1. Sediment samples for contaminant analysis were collected from 12 Export Cable Corridor sites and 15 sites within Tranche A itself. Full results, including laboratory certification, are reported in Appendix VIII.

3.2.2. Contaminant concentrations were compared, where available, with both Cefas (2003) Action Levels and OSPAR Effects Range Low (ERL) and Effects Range Medium (ERM) levels. Table 3.2 presents a summary of this analysis, showing where concentrations of particular metals breach these criteria.

3.2.3. Concentrations of mercury were below the respective AL1 concentrations in all cases (Cefas 2003, Appendix VIII). Arsenic was above AL1 in three of the Export Cable Corridor sediment samples (CABA_07, CABA_23 and NS_08); lead was above AL1 in five Export Cable Corridor route samples; nickel was above AL1, but below AL2, in seven Export Cable Corridor sites and one site in Tranche A. Chromium was above AL1 in seven Export Cable Corridor sites and one Tranche A sites (TA_58). Within these results, multiple metal contaminants detected were present at most of the nearshore

(NS) Export Cable Corridor sites (Figure 3.6). This figure is also provided as an A3 size chart (Chart 3) in Appendix V). No sites breached CEFAS AL2 concentrations.

Table 3.2 Sediment metal concentrations and associated quality criteria with values below (green) and above (red) guidelines.

Metal	Cefas Action Levels		OSPAR	
	AL1	AL2	ERL	ERM
Arsenic	3		7	
Cadmium	4			
Chromium	8		6	
Copper	6		8	
Lead	5		5	
Mercury				
Nickel	8		8	4
Zinc				

Note: numbers of samples indicated in exceedance of limits.

3.2.4. Sediment metal concentrations were also compared to the OSPAR ERL and ERM levels set by the Clean Seas Environment Monitoring Programme (CSEMP), the mechanism through which the UK fulfils its commitments to OSPAR. ERLs and ERMs were developed by the United States Environmental Protection Agency (EPA) for assessing the ecological significance contaminant of concentrations. It is considered that concentrations below the ERL rarely cause adverse effects in marine organisms; however, concentrations above the ERM will often cause adverse effects in some marine species (OSPAR 2009a).

3.2.5. Concentrations of mercury and Cadmium were below the ERL at all sample sites. Concentrations of Arsenic were higher than the ERL, but below the ERM, at sites CABA_7, CABA_23, NS_32, NS_33, NS_34 and NS_8 within the Export Cable Corridor and site 58 in Tranche A. Levels of copper were above the ERL but below the ERM in all the NS sites and CABA_23 along the Export Cable Corridor and Tranche A site TA_58. Chromium was above ERL levels at four nearshore sites, the export corridor site CABA_23 and Tranche A site 58. Lead was found above the ELR but below the ERM at Export Cable Corridor site 23 and four of the NS sites. Only Nickel was found above the ERM levels, at sites CABA_23, NS_21, NS_33 and NS_34. Nickel was also found above the ERL, but below the ERM, at all the remaining NS sites. All five of the metals detected above the ERL during contaminant sampling of Tranche A and Export Cable Corridors were present at these levels in site 23.

3.2.6. The Marine Environment Monitoring and Assessment National database (MERMAN) is a national database which holds and provides access to data collected under the Clean Safe Seas Environmental Monitoring Programme (CSEMP). The British Oceanographic Data Centre (BODC) acts as the Data Manager for MERMAN and the data can be accessed through the BODC website. These data are included in Oslo and Paris Convention (OSPAR) assessments to fulfil the UK's contribution to OSPAR. The Effects Range Low (ERL) and Medium (ERM) assessment criteria for metals in sediment used by CSEMP were originally developed in the United States as reported by Long *et al*. (1995). Investigation

of the information held on the BODC website indicates that the levels of metals found above CEFAS AL1, and the results for Nickel above ERM level, are not unusual for the nearshore Humber region.

3.2.7. All polyaromatic hydrocarbon (PAH) concentrations and other micro-organic pollutants were below the available assessment criteria (Cefas, 2003; OSPAR, 2009a, Appendix VIII**Error! Reference source not found.**) for Tranche A and Export Cable corridor sites with the exception of Naphthalene and Phenanthrene at some near shore cable route sites:

- C1 Naphthalene at NS_CHEM_21 and NS_CHEM_32
- C2 Naphthalene at NS_CHEM_21, NS_CHEM_28 and NS_CHEM_32
- C3 Naphthalene at NS_CHEM_32
- C4 Naphthalene at NS_CHEM_21, NS_CHEM_32 and NS_CHEM_33
- C1 Phenanthrene at NS_CHEM_21 and NS_CHEM_32
- C2 Phenanthrene at NS_CHEM_21, NS_CHEM_32 and NS_CHEM_33
- C3 Phenanthrene at NS_CHEM_ NS_CHEM_21, NS_CHEM_28, NS_CHEM_32 and NS_CHEM_33
- C4 Phenanthrene at NS_CHEM_28

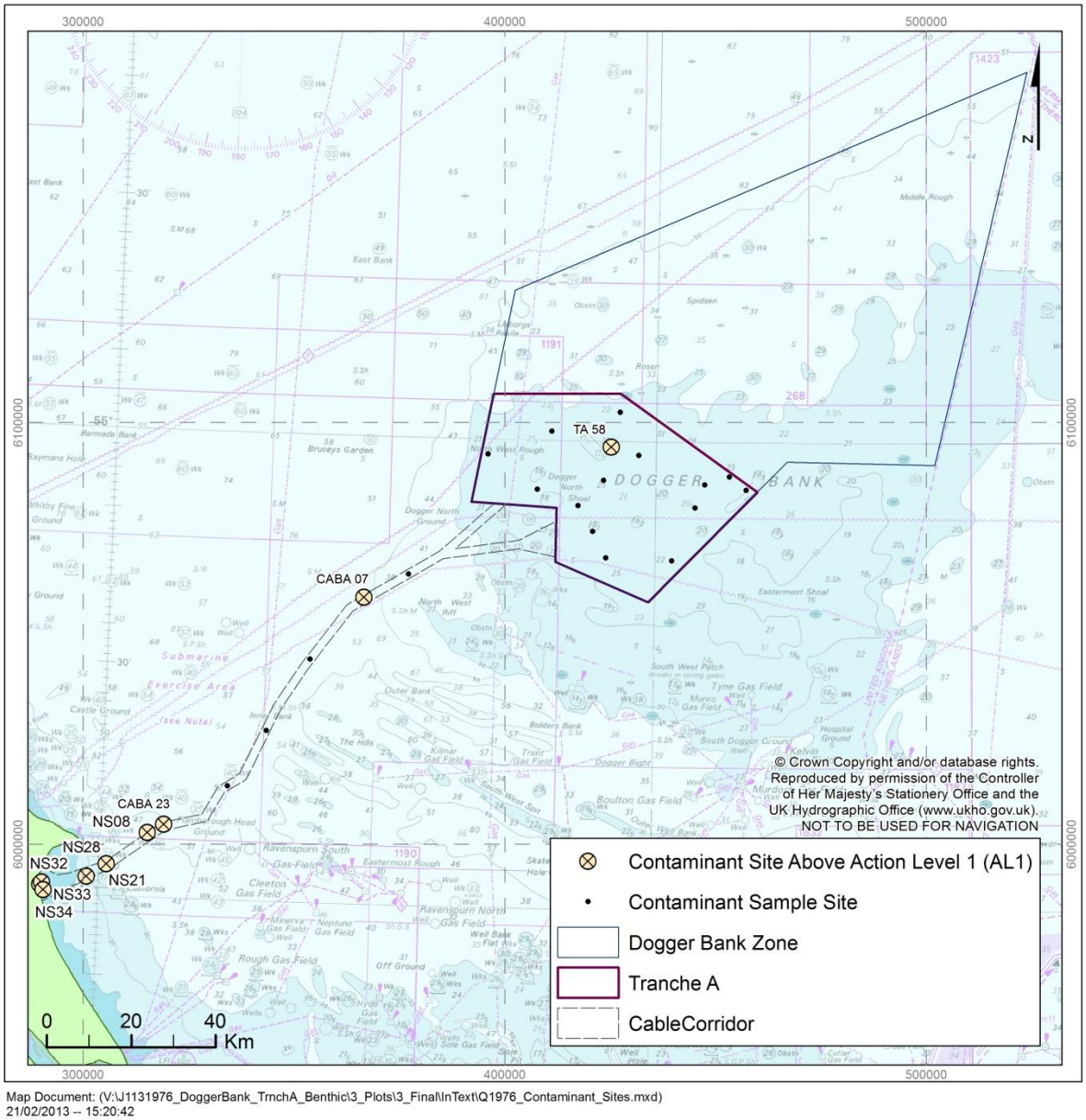


Figure 3.6 Location of site containing one or more contaminants in excess of either Cefas or EPA action levels.

3.3. Macrofaunal grab sample data

3.3.1. Appendix IX presents species abundance data for each grab sample both raw and rationalised data (i.e. removal of algae, meiofauna, pelagic organisms and reconciliation of the same species recorded at different taxonomic levels). A total of 588 taxa were recorded from the grab samples following data rationalisation.

3.3.2. Using the reconciled data (all fauna) the numbers of species/taxa per sample ranged between four and 107 per 0.1 m^2, with an average value of 32 species per 0.1 m^2. Abundances ranged between seven and 1,226 individuals per 0.1 m^2 with an average of 130 individuals. The distribution of species

number and abundance is presented in Figure 3.7 and Figure 3.8 respectively. These figures are also provided as A3 size charts, providing a more detailed representation (Chart 4 and 5) in Appendix V.

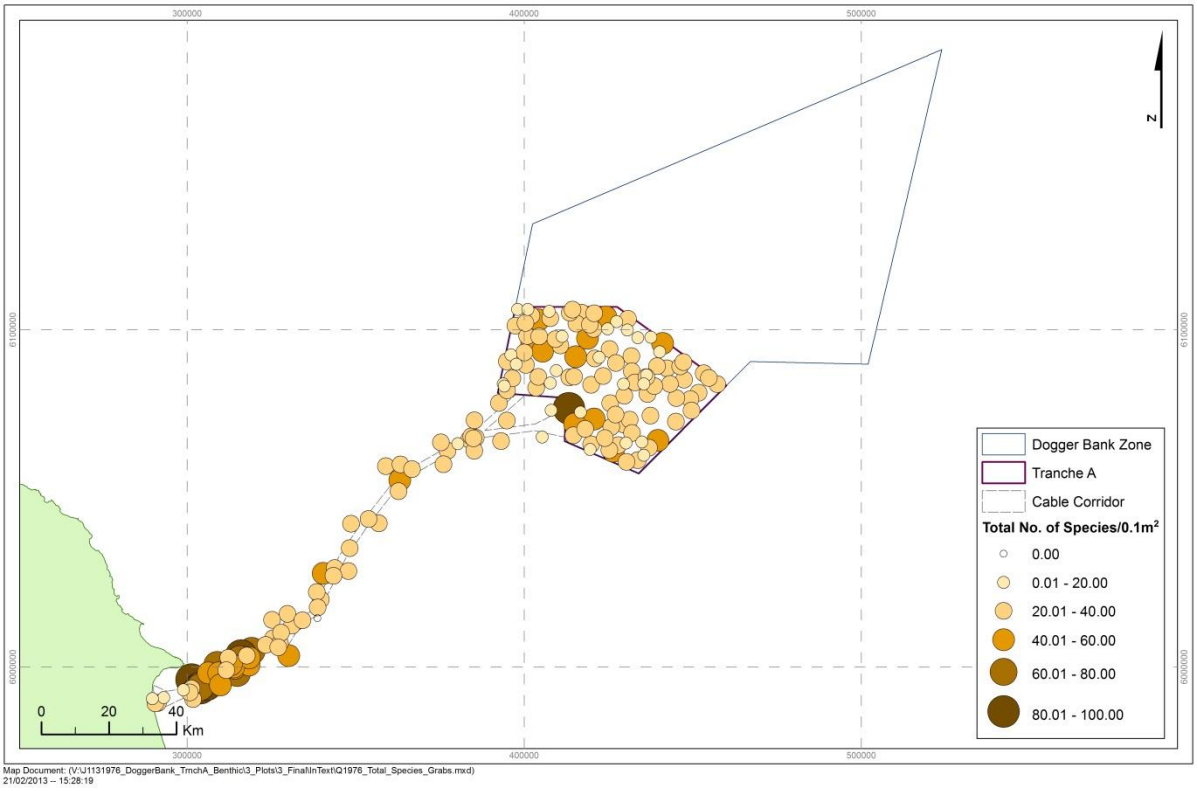


Figure 3.7 Distribution of total numbers of species/taxa per 0.1 m^2

3.3.3. A degree of distribution pattern, with respect to the number of species is evident (Figure 3.7 and provided as A3 Chart 5 in Appendix V). Most sites over the majority of the export cable corridor and Tranche A sites supported between 20 and 40 species, with several sites in Tranche A supporting between 40 and 60 species. Tranche A also exhibited numerous sites with very low species numbers, with a total of 25 sites comprising less than 20 species. In contrast, the inshore end of the cable route supported many sites with more than 60 species, including several sites with more than 80 species.

3.3.4. Figure 3.8 summarises the number of individuals, taking into account that colonial epifauna were only registered as present or absent, i.e. with a maximum abundance of one. Maximum abundances were evident in the Tranche A area, with 11 sites supporting more than 200 individuals per 0.1 m^2 and in the inshore cable route area where 13 sites supported more than 200 individuals per 0.1 m^2. Similar to the species numbers, the lowest abundances were found in Tranche A (21 sites <50 per 0.1 m^2).

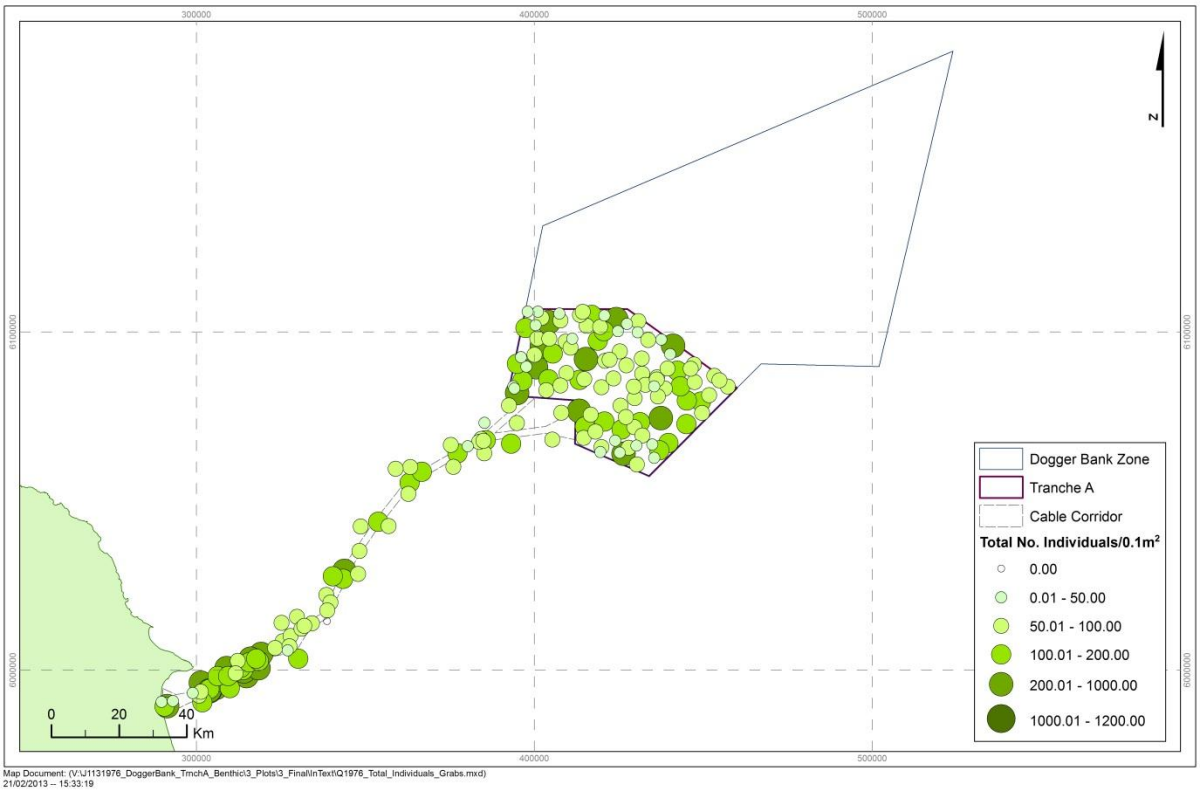


Figure 3.8 Distribution of number of individuals per 0.1 m^2 across the survey area.

3.3.5. Table 3.3 summarises the distribution of species amongst the principal macro-invertebrate taxonomic groups (taking into account that abundance of sessile colonial species are counted as 1), the data demonstrates the dominance of Annelida (segmented worms) in terms of both species occurrence (32.1%) and abundance (52.6%). Crustacea (principally amphipods and crabs) and Mollusca (principally bivalves) were at a similar level of importance, with 22.1% and 20.8 of taxa respectively and 12.9% and 14.7% of individuals. The Echinoderms, although only accounting for 5.3% of species occurrence, contributed 11.5% of the number of individuals.

3.3.6. Among the colonial sessile taxa, bryozoans (sea mats) and cnidarians (sea firs and anemones) accounted for around 10.5% and 4.3% of the total species variety respectively. A further 11 taxonomic groups were represented, although all of these comprised of less than 1% or less of species occurrence. Of these only the Nemertea, and Phoronida contributed 1% or more of the individuals.

Table 3.3 Summary of numbers of species in each principal phyla.

Taxonomic Group	Number of taxa	% of taxa	No. of individuals	% of individuals
Annelida	189	32.1	12236	52.6
Crustacea	130	22.1	2989	12.9
Mollusca	119	20.8	3407	14.7
Bryozoa	62	10.5	386	1.7

Taxonomic Group	Number of taxa	% of taxa	No. of individuals	% of individuals
Echinodermata	31	5.3	2675	11.5
Cnidaria	25	4.3	377	1.6
Pisces	6	1.0	35	0.2
Chelicerata	6	1.0	71	0.3
Phoronida	5	0.9	226	1.0
Porifera	4	0.7	42	0.2
Tunicata	3	0.5	10	0.1
Enteropneusta	2	0.3	3	<0.1
Entoprocta	2	0.3	2	<0.1
Nemertea	1	0.2	380	1.6
Nematoda	1	0.2	1	<0.1
Leptocardii	1	0.2	174	0.7
Turbellaria	1	0.2	16	0.1
Total	**588**	**100**	**23241**	**100**

3.3.7. The most conspicuous species found in the grab samples, in terms of mean abundance and frequency of occurrence, are presented in Table 3.4. The most frequently occurring were from a variety of taxa, with the polychaete *Spiophanes bombyx* a species that had one of the highest mean abundances at 5.7 individuals per 0.1 $m^{2,}$ found in 68% of sites,. The three other most frequently occurring individuals were the echinoderm *Echinocyamas pusillus* (64%), the amphipod *Bathyporeia elegans* (57%) and the NEMERTEA (54%). Most other species were present in 50% or less of the sites, suggesting a high degree of spatial variability. Mean densities in most cases were also low, with many of the most frequently occurring species found at levels below 2 per m^2. The juvenile SPATANGOIDA were found at the highest mean abundance with 6.5 individuals per 0.1 m^2. Of the most frequently found species, only one colonial epifaunal species was identified, from the CAMPANULINIDA.

3.3.8. A large number of the species found at individually large abundances were not recorded frequently or in high average abundance. This is illustrated in Table 3.4, with only three of the 20 most frequently occurring species supporting high individual maxima. Of those species not found frequently, some of the more notable with individually large abundances included the polychaetes *Polygordius* spp., *Protodorvillea kefersteini Melinna elisabethae* and the encrusting polychaete *Pomatoceros* spp. Other high density species included the barnacles *Verruca stroemia* and *Balanus crenatus,* along with the cryptic crab *Pisidia longicornis.* The considerable individual densities of some of these species, combined with low frequency of occurrence, reinforces the potential presence of a number of discrete community types.

Table 3.4 Top 20 most abundant and frequently recorded species from grab samples.

Most frequently recorded			Most abundant	
Species	**Frequency**	**Mean Abundance (0.1 m^2)**	**Species**	**Max Abundance**
Spiophanes bombyx	68%	5.7	*Polygordius* spp.	981.0
Echinocyamus pusillus	64%	3.7	SPATANGOIDA (juv.)	213.0
Bathyporeia elegans	57%	4.7	*Protodorvillea kefersteini*	197.0
NEMERTEA	54%	2.1	*Melinna elisabethae*	194.0
Fabulina fabula	51%	3.3	*Pomatoceros* spp.	179.0
Goniada maculata	51%	1.3	*Verruca stroemia*	177.0
Glycinde nordmanni	45%	0.8	Anomiidae (juv.)	169.0
Magelona johnstoni	42%	1.4	*Pisidia longicornis*	162.0
Magelona filiformis	42%	1.1	*Balanus crenatus*	100.0
SPATANGOIDA (juv.)	41%	6.5	*Mysella bidentata*	92.0
CAMPANULINIDA	41%	0.4	*Pisione remota*	87.0
Polinices pulchellus	39%	0.8	*Notomastus* spp.	83.0
Dosinia spp. (juv.)	39%	0.8	*Chone* sp.	81.0
Phaxas pellucidus	39%	0.8	*Mediomastus fragilis*	78.0
Abra prismatica	38%	1.4	*Lumbrineris cingulata*	72.0
Nephtys cirrosa	37%	0.9	*Spiophanes bombyx*	70.0
Owenia fusiformis	37%	0.8	*Echinocyamus pusillus*	67.0
Thracia phaseolina	35%	0.7	*Branchiostoma lanceolatum*	62.0
Bathyporeia tenuipes	35%	0.7	*Eulalia* spp.	61.0
Scoloplos armiger	34%	1.1	*Orchomenella nana*	61.0

3.3.9. Biomass analysis results are presented in Appendix X. The distribution of total biomass is presented in Figure 3.9. This figure is also provided as an A3 size chart (Chart 6) in Appendix V. Levels were generally low across the study area with the majority of the sites, particularly those in the cable route area, supporting 4 mg of less ash free dry weight (AFDW)/0.1 m^2. The majority of the high biomass sites were located in several well defined areas of Tranche A, particularly to the west of the area, and a group of high biomass levels located in a line from the south east corner to the northern edge. Maximum biomass levels in excess of 10 mg (AFDW)/0.1 m^2 per site were noted in these areas.

3.3.10. The faunal biomass was overwhelmingly dominated by the Echinodermata, accounting for 54% of the total. The Annelida represented 22% of the total biomass, with the Mollusca and Crustacea supporting 19% and 1% of the total biomass respectively. On a site by site average basis, the mean contribution of the Echinodermata was 66% followed by the Mollusca at 22%, the Annelida at 9% and the Crustacea at 6%. Clearly the concentration of some of the biomass due to the Echinodermata was considerable.

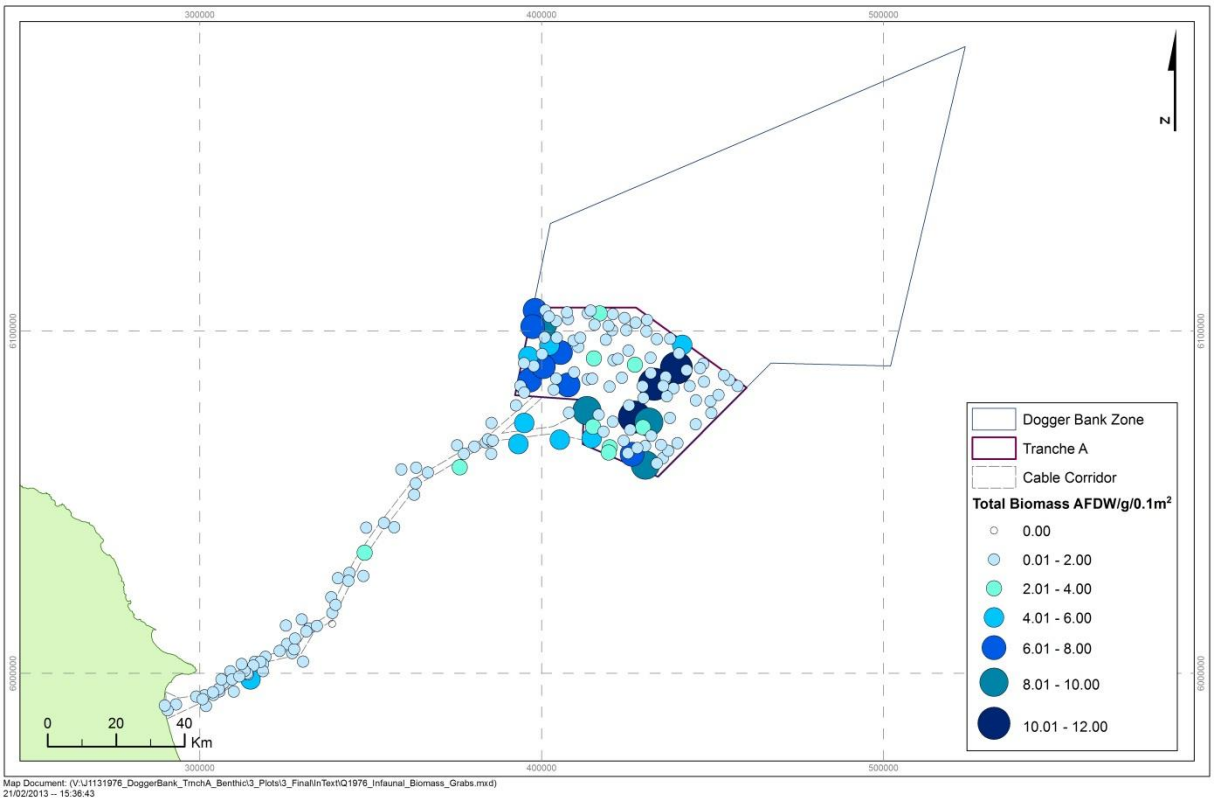


Figure 3.9 Distribution of infaunal biomass g / 0.1 m^2

3.4. Multivariate analysis

3.4.1. Faunal data were analysed in two parts, data excluding colonial epifauna and data including colonial epifauna. The separate analyses of these data resulted in very slight differences in site groupings. The following includes the epifaunal data. An initial separation (first cut) of sites was evident at a site similarity level of 16% (Figure 3.10) resulting in two large groups b and c and small third group, a.

3.4.2. This separation of sites was related to the overall physical condition of the seabed, with clear sediment differences between the two main groups of sites. Cluster b (Figure 3.11a) was primarily composed of sandy gravels with significant gravel components present, while cluster c (Figure 3.11b) was composed of sandy sediments, the fine sands particularly predominating. Cluster a comprised of mixed sediments.

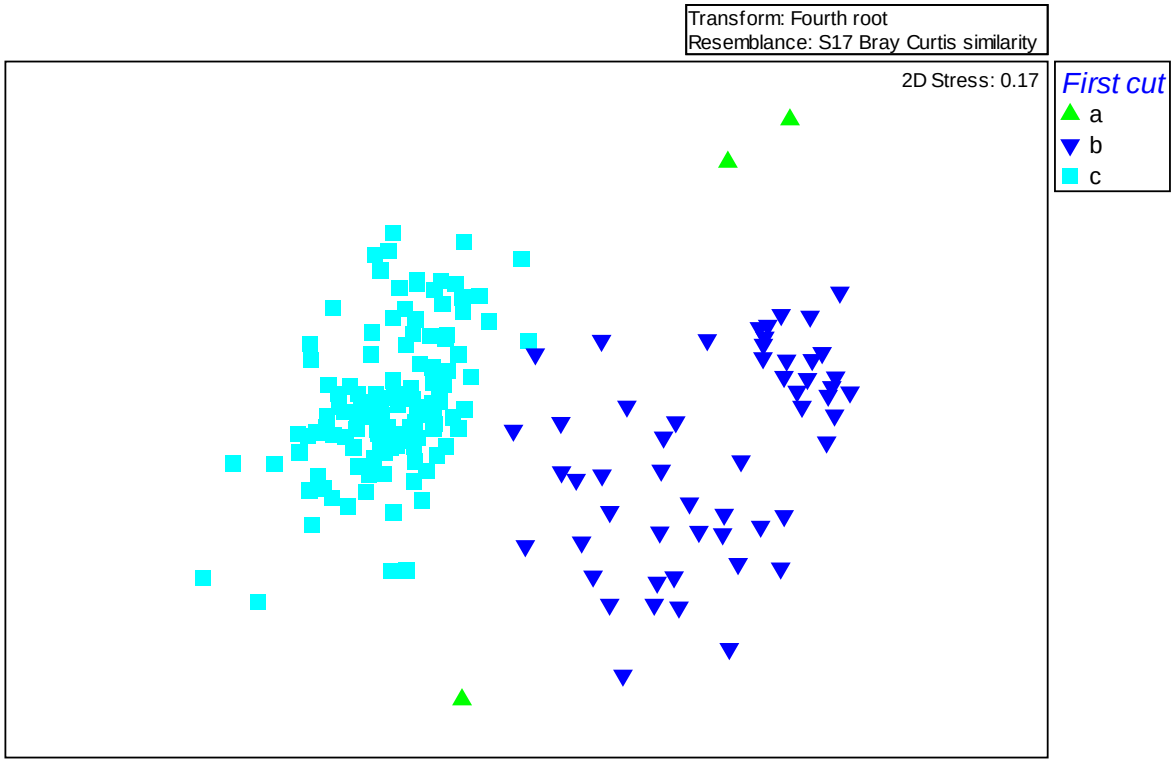


Figure 3.10 **Initial site separation based on a between site similarity of less than 16%.**

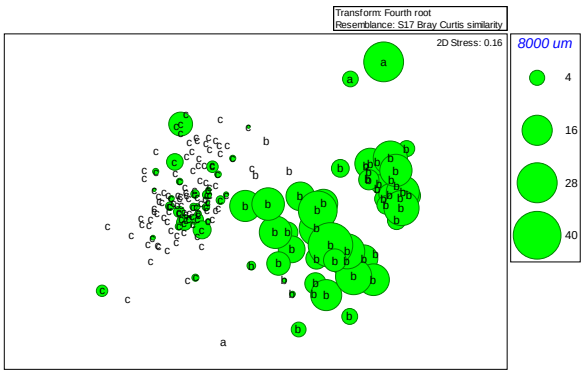


Figure 3.11a **Percentage of 8 mm gravel overlaid on to nMDS of initial separation of sites based on faunal similarity.**

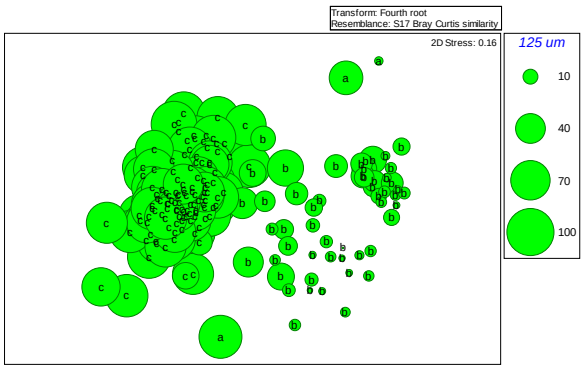


Figure 3.11b **Percentage of 125 µm overlaid on to nMDS of initial separation of sites based on faunal similarity.**

3.4.3. No single species represented either of the two major sub-groups, although it was apparent that certain species, derived from the SIMPER analysis, were more representative of one or other of the groups. For example, several robust polychaetes, including *Glycera lapidum* in Cluster b; and a range of more delicate polychaetes, swimming amphipod crustaceans and several bivalve molluscs (for example *Fabulina fabula*) in Cluster c (see examples in Figure 3.12a and b). The smaller cluster a, separated on the basis of the occurrence of *Mytilus edulis.*

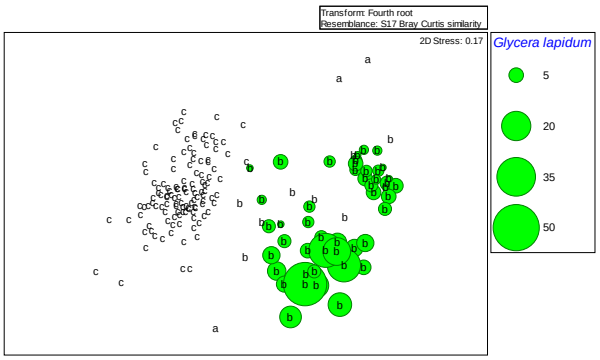


Figure 3.12a Abundance 0.1 m^2 of *Glycera lapidum* overlaid on initial separation of sites.

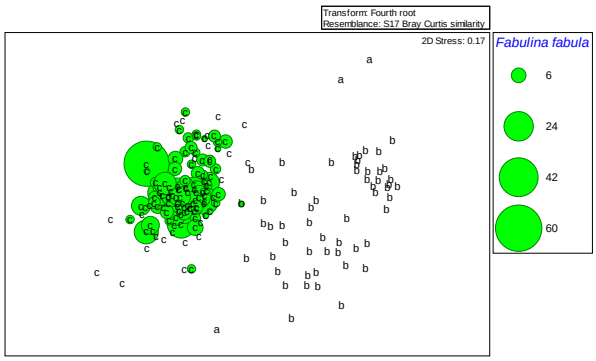


Figure 3.12b Abundance 0.1 m^2 of *Fabulina fabula* overlaid on initial separation of sites.

3.4.4. The faunal data were subsequently analysed with a variety of options available in PRIMER with respect to potential separation of clusters of sites. SIMPROF analysis resulted in a considerable number of separate groups, which were not practical in terms of describing the communities present. It was also evident that some of these groups comprised a gradient of both species and community change. An intermediate number of clusters were, therefore, arrived at after the 2nd cut (Figure 3.13), which enabled a relatively clear description of the environmental and ecological conditions to be made, including consideration of the community gradient in the largest of the clusters.

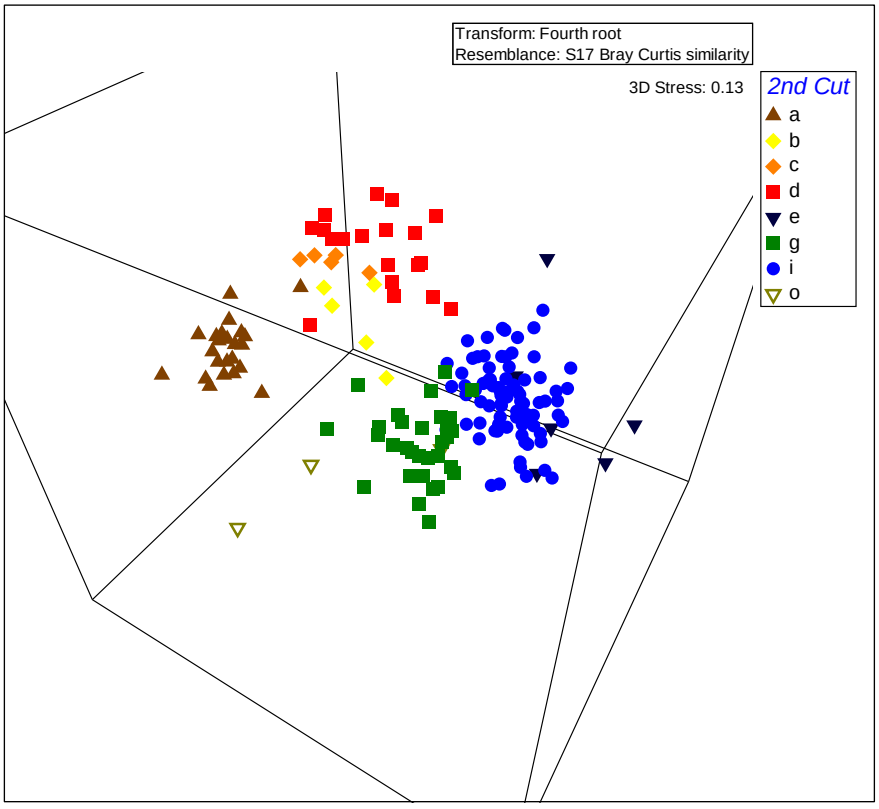


Figure 3.13 Secondary separation of clusters based on a between site similarity of better than 20%.

3.4.5. The main clusters were defined, based on a generic separation at a level of 20% similarity, with most groups having a within site similarity of between 30 and 40%. A total of five clusters, with six or more sites have been identified, with three additional clusters comprising between three and five sites. A summary of the faunal composition of the main clusters is provided in Table 3.5 with a description of the smaller clusters provided in the text. This summary includes values for selected community structure measures and physical characteristics.

3.4.6. The two clusters d and a supported the greatest numbers of species with similarly large numbers of individuals. There was a little overlap in the composition of the species encountered in each of these communities, with Cluster d clearly infaunally dominated and supporting a wide range of polychaete species. Cluster a in contrast, although dominated by polychaetes also comprised a range of epifaunal, encrusting species, including barnacles and chitons. Table 3.5 clearly indicates the dominance of a range of robust polychaetes, including *Polygordius* spp. and *Protodorvillea kefersteini* along with the characteristic coarse sandy gravel dwelling lancelet *Branchiostoma lanceolatum* in Cluster d. The influence of these species in the separation of the clusters is demonstrated in **Figure** 3.14a and b.

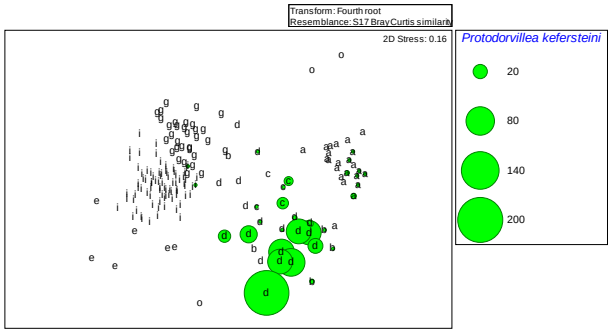


Figure 3.14a Abundance 0.1 m^2 of *Protodorvillea kefersteini* overlaid on secondary separation of sites.

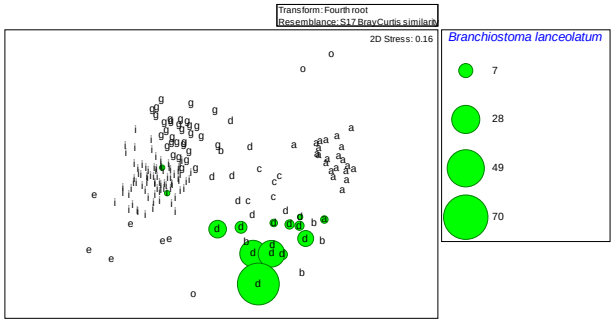


Figure 3.14b Abundance 0.1 m^2 of *Branchiostoma lanceolatum* overlaid on secondary separation of sites.

3.4.7. The dominant and characteristic species of Cluster a were drawn from a diverse range of taxonomic groups and the cluster supported overall the largest mean number of species. Some of the most characteristic species however, were still polychaetes, such as *Melinna elisabethae* (Figure 3.15a) *Lumbrineris cingulate* and *Sabellaria spinulosa* (Figure 3.15b).

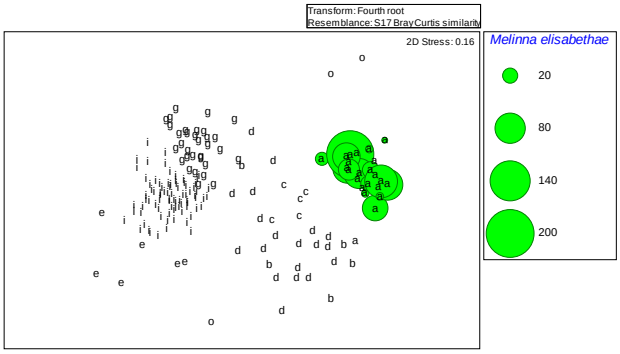


Figure 3.15a Abundance 0.1 m^2 of *Melinna elisabethae* overlaid on secondary separation of sites.

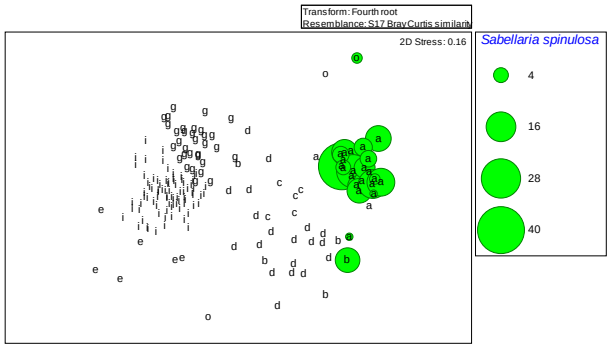


Figure 3.15b Abundance 0.1 m^2 of *Sabellaria spinulosa* overlaid on secondary separation of sites.

Table 3.5 Summary biological and physical attributes of sample groups derived from multivariate sample sorting of the faunal grab data.

Cluster i 82 sites 40% similarity			Cluster g 32 sites 37% similarity			Cluster d 19 sites 33% similarity			Cluster a 23 sites 39% similarity			Cluster e 6 sites 20% similarity		
Species Composition - Dominant and characteristic species based on >2% contribution to cluster.														
Species	Mean no.		Species	Mean no.		Species	Mean no.		Species	Mean no.		Species	Mean no.	
Spiophanes bombyx	10.2		SPATANGOIDA (juv.)	21.4		**Polygordius spp.**	**72.4**		**Melinna elisabethae**	**37.0**		**Nephtys cirrosa**	2.5	
Bathyporeia elegans	**8.1**		Amphiuridae (juv.)	5.1		**Protodorvillea kefersteini**	**31.3**		**Lumbrineris cingulata**	**27.4**		Bathyporeia elegans	2.5	
Fabulina fabula	6.4		**Phoronis spp.**	4.4		Notomastus spp.	19.7		Verruca stroemia	18.4		Bathyporeia guilliamsoniana	1.8	
SPATANGOIDA (juv.)	5.4		Scoloplos armiger	4.3		**Echinocyamus pusillus**	15.0		Pomatoceros spp.	9.7				
Magelona johnstoni	**2.6**		Bathyporeia elegans	4.2		Pisione remota	14.5		Hydroides norvegica	8.8				
Sigalion mathildae	2.4		Spiophanes bombyx	4.0		Glycera lapidum	10.3		Serpulidae	8.8				
Magelona filiformis	2.0		Echinocyamus pusillus	2.4		**Branchiostoma lanceolatum**	**7.9**		**Sabellaria spinulosa**	**7.5**				
Echinocyamus pusillus	1.7		Abra prismatica	2.2		NEMERTEA	7.6		Leptochiton asellus	5.0				
Bathyporeia guilliamsoniana	1.5		Bathyporeia tenuipes	2.1		Malmgreniella spp.	5.2		Anobothrus gracilis	3.8				
Nephtys cirrosa	1.5		Goniada maculata	2.1		Aonides paucibranchiata	4.8		Chone sp.	3.5				
Phaxas pellucidus	1.4		**Amphiura filiformis**	1.9		Goniadella gracilis	2.7		Glycera lapidum	3.0				
Dosinia spp. (juv.)	1.2		Fabulina fabula	1.78		Polycirrus spp.	2.1		NEMERTEA	3.0				
Goniada maculata	1.2		Owenia fusiformis	1.69		Eunereis longissima	2.1		SIPUNCULA (juv)	3.0				
Thracia phaseolina	1.2		Sthenelais limicola	1.66		Polinices pulchellus	2.0		Echinocyamus pusillus	3.0				
			Edwardsiidae	1.19		Glycinde nordmanni	1.7		Polydora spp.	2.9				
						Dosinia exoleta	1.6		Mediomastus fragilis	1.7				
						Electra pilosa	0.6		Glycinde nordmanni	1.3				
									Schizomavella auriculata	1.0				
Community measures														
Measure	Value	sd	Measure	Value	sd	Measure	Value	sd	Measure	Value	sd	Measure	Value	sd
S	24	6	S	31	6	S	37	10	S	63	20	S	10	3
N	73	33	N	98	62	N	271	277	N	256	151	N	19	6
d	5.4	1.1	d	6.7	1.1	d	6.8	1.7	d	11.40	2.83	d	3.1	0.9
J'	0.84	0.08	J'	0.84	0.12	J'	0.77	0.14	J'	0.77	0.09	J'	0.90	0.04
H'(loge)	2.62	0.35	H'(loge)	2.86	0.42	H'(loge)	2.75	0.56	H'(loge)	3.17	0.43	H'(loge)	2.04	0.41
Physical characteristics														
Measure	Value	sd	Measure	Value	sd	Measure	Value	sd	Measure	Value	sd	Measure	Value	sd
Depth (m)	28.5	4.0	Depth (m)	58.9	7.3	Depth (m)	30.0	7.7	Depth (m)	47.1	11.9	Depth (m)	22.3	11.3
% GRAVEL:	10.9	23.3	% GRAVEL:	1.6	4.2	% GRAVEL:	21.8	32.6	% GRAVEL:	38.6	21.3	% GRAVEL:	13.9	27.5
% SAND:	86.8	24.0	% SAND:	95.5	4.4	% SAND:	76.3	32.7	% SAND:	54.5	20.7	% SAND:	84.7	27.1
% MUD:	2.3	6.5	% MUD:	2.9	1.5	% MUD:	2.0	2.4	% MUD:	6.9	2.7	% MUD:	1.4	0.5
Mean PSD µm	743	1569	Mean PSD µm	196.9	62.0	Mean PSD µm	1869.0	3522.1	Mean PSD µm	1538.6	1519.7	Mean PSD µm	928.3	1707.0
Sorting	2.26	1.99	Sorting	1.58	0.76	Sorting	3.08	2.59	Sorting	6.80	2.48	Sorting	1.83	0.71

3.4.8. The diversity of taxonomic groups in Cluster a and the different types of habitat exploitation demonstrated by the species, for example the barnacles, tube worms and bryozoa in association with the encrusting polychaetes *Pomatoceros* spp. and *Hydroides norvegica* and the infaunal dwelling polychaete *Melinna elisabethae,* suggests a diversity of habitat type. This is reflected in the physical conditions of the sites in Cluster a, (Table 3.5) which included the largest proportion of gravels in the major clusters in combination with the largest proportions of silt. This is summarised in Figure 3.16a and b in which the relative proportions of gravel can be seen to be raised in Clusters a, c and d, with the largest levels of silt also found in a.

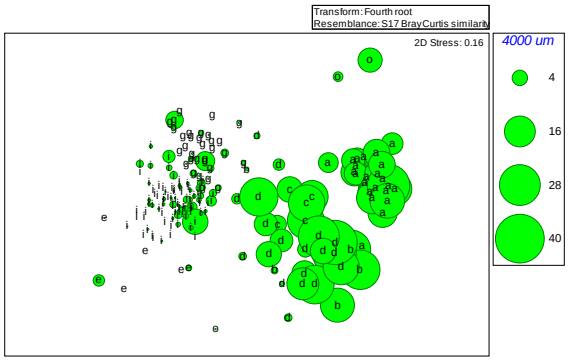


Figure 3.16a Percentage gravel, 4000 µm overlaid on secondary separation of sites.

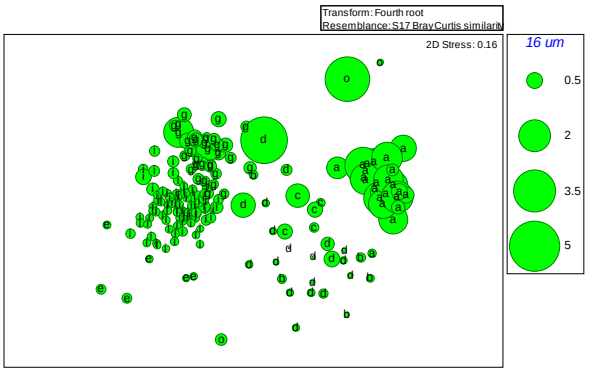


Figure 3.16b Percentage of silt 16 µm overlaid on secondary separation of sites.

3.4.9. Clusters i and g represent the largest number of sites, with Cluster i comprising of 82 and Cluster g 32. These clusters supported relatively different dominants, although overlap of species between the two clusters was evident, with much of the separation related to abundance differences. A good example of this is illustrated in Figure 3.17a and b with the bivalve mollusc *Fabulina fabula,* one of the dominants in Cluster i, although clearly overlapping with Cluster g, and the juvenile SPATANGOIDA dominating in Cluster g but overlapping extensively with sites in Cluster i.

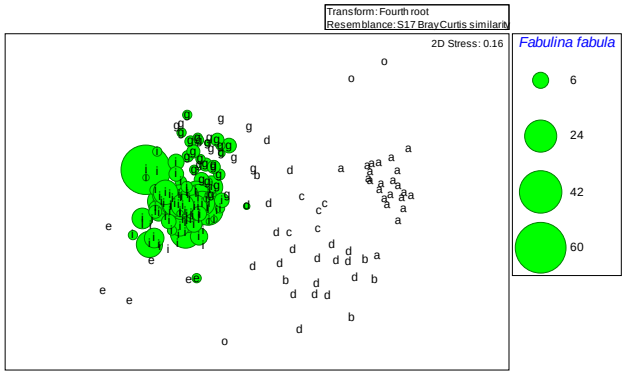


Figure 3.17a Abundance 0.1 m^2 of *Fabulina fabula* overlaid on secondary separation of sites.

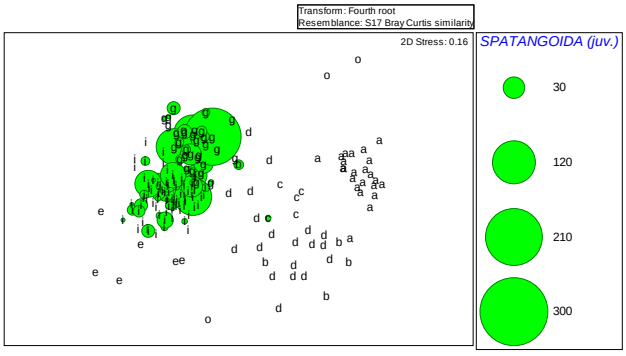


Figure 3.17b Abundance 0.1 m^2 of juvenile SPATANGOIDA overlaid on secondary separation of sites.

3.4.10. This overlapping of species is not surprising given the results of the cluster analysis, which indicated that those sites in Clusters i and g appear to fall along a continuum of site clustering and, hence, community change. Cluster e also forms part of this continuum at the extreme end of the habitat range. Clusters e and i were from relatively shallow waters comprising gravelly sands, with the sites

from cluster g found in the deepest waters, comprising almost exclusively of sands. Cluster e had a very limited species composition with some sites supporting very low numbers of species and individuals. The sites in this cluster were characterised by highly mobile swimming polychaetes and crustacea, such as *Nephtys cirrosa* (**Figure** 3.18a) and the *Bathyporeia* (**Figure** 3.18b) species respectively, although all demonstrating a gradient of abundance across clusters, e, i and g.

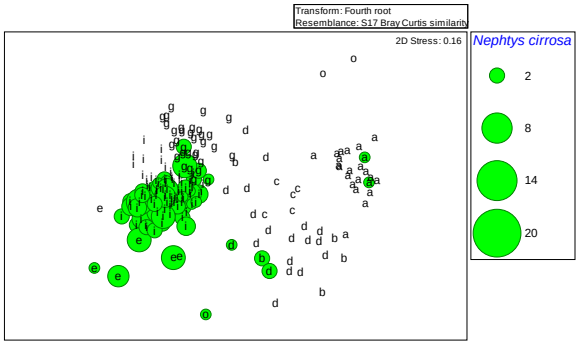


Figure 3.18a Abundance 0.1 m^2 of *Nephtys cirrosa* overlaid on secondary separation of sites.

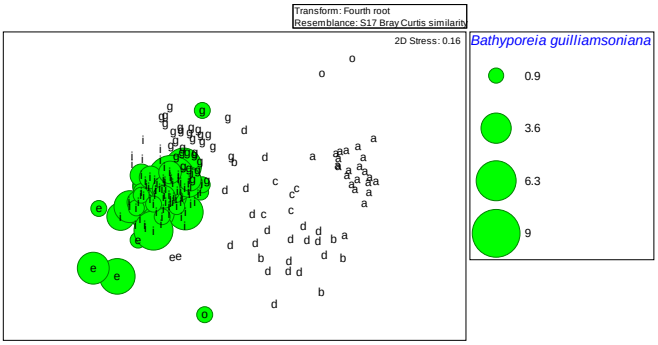


Figure 3.18b Abundance 0.1 m^2 *of Bathyporeia elegans* overlaid on secondary separation of sites.

3.4.11. The community within Cluster g has been distorted to some extent by the presence of juveniles of the SPATANGOIDA and Amphiuridae, heart urchins and burrowing brittlestars respectively. However, the presence of adult echinoderms, specifically *Amphiura filiformis* in Cluster g (**Figure** 3.18a) and absence of either juvenile and adult echinoderms from the dominant species group in cluster i, suggest this separation is based on real differences rather than just a seasonal difference resulting from recent settlement.

3.4.12. Of the smaller clusters, b and c were closely linked to the major Cluster d, both comprising of five sites. Despite their overall similarity to cluster d, they differed considerably in their physical condition and community structure and composition. Cluster b was from coarse sand, including large proportions of fine gravels, while cluster c was from relatively well sorted sediment comprising a mixture of sands and gravels, with sand proportionally the greatest constituent. Both clusters of sites were from similar depths.

3.4.13. The community in cluster b was relatively impoverished with a mean number of 29 species and 89 individuals. The dominant species were *Ophelia borealis* and *Echinocyamus pusillus*, although both of these were also present in a wide range of other clusters. No species were characteristic of the group and this cluster may be best described as an impoverished version of cluster d, probably due to the apparently more harsh physical conditions illustrated by the generally greater quantities of coarse sediment. Cluster c in comparison supported a high diversity of species with 57 species and 325 individuals, despite the largely sandy character of the sediment, which in general would indicate hydrodynamic instability which limits diversity. The fauna was dominated and characterised by several robust and coarse sand dwelling polychaete species including *Scalibregma inflatum* (**Figure** 3.19b) and *Pholoe* spp. The increased diversity may occur as a result of increased sediment diversity between the different sites in the cluster, including a mixture of gravels and silts.

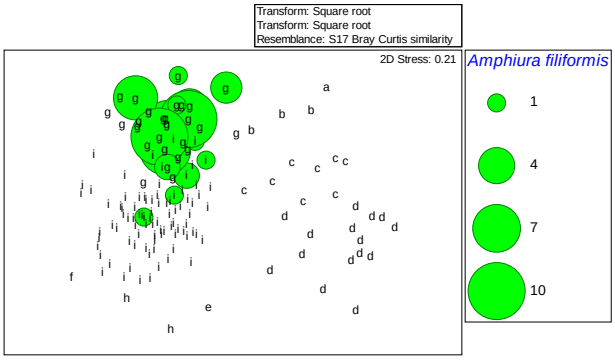


Figure 3.19a Abundance 0.1 m^2 of *Amphiura filiformis* overlaid on secondary separation of sites.

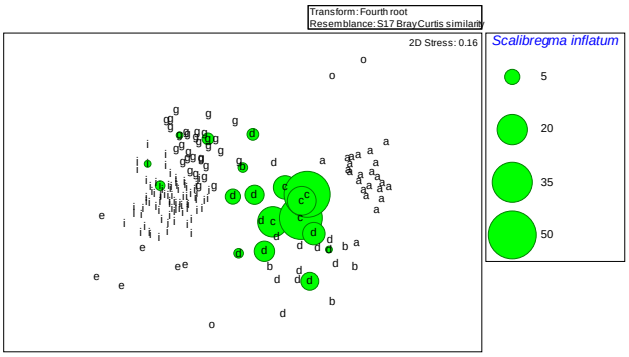


Figure 3.19b Abundance 0.1 m^2 of *Scalibregma inflatum* overlaid on secondary separation of sites.

3.4.14. Several outlier sites were identified which were separated from the rest of the sites due to the presence of *Mytilus edulis* (Figure 3.20) and a range of bryozoa and hydrozoa. The sites were from shallow waters and one of the sites (NS32) comprised large proportions of coarse sediment, while site NS31 had the largest proportion of mud (22%), with NS29 substantially composed of sand.

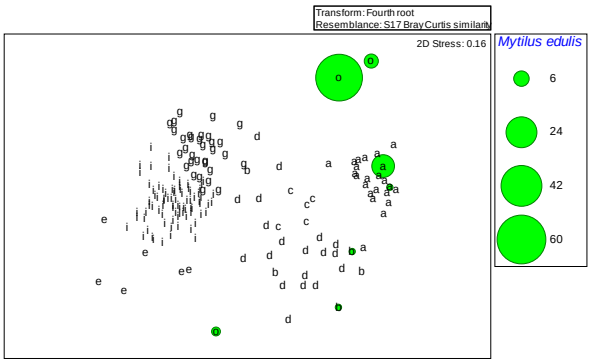


Figure 3.20 Abundance 0.1 m^2 of *Mytilus edulis* overlaid on secondary separation of sites.

3.4.15. The species diversities described above (and below) provide a measure of relative diversity between the samples recorded in this report, and are not a measure of diversity in the context of the wider area. The scale is provided below in **Error! Reference source not found.**.

Table 3.6 Summary of site comparative diversity measures within the dataset

Diversity	No. Species
Very High	>60
High	**>40**
Moderate	30-40
Low	<30
Very low	<10

3.4.16. Assessment of the faunal groupings with respect to the physical environment is further summarised through the employment of PCA and BIOENV. The PCA plot illustrated below (Figure 3.21), using the summarised physical data, indicates several clear trends. The majority of the separation relates to a sediment gradient from gravel to sand, accounting for 78% of the cumulative variation. Located at the extreme sandy end of the gradient were clusters g and i, with the most well sorted sediments of cluster e also found (note the sorting values are inverse, i.e. small values represent greater levels of sorting). The more gravelly sediments were found in the sites comprising clusters d and b. The third eigenvector, which represented a further 15% of the variability, explains the factors related to % mud and depth, clearly linked to the sites from cluster a and, to a lesser extent, cluster g.

3.4.17. The outcome of the BIOENV analysis indicated that a single variable (Mean diameter) could be used to explain the majority of the variability with a Spearman rank correlation value of 0.973.

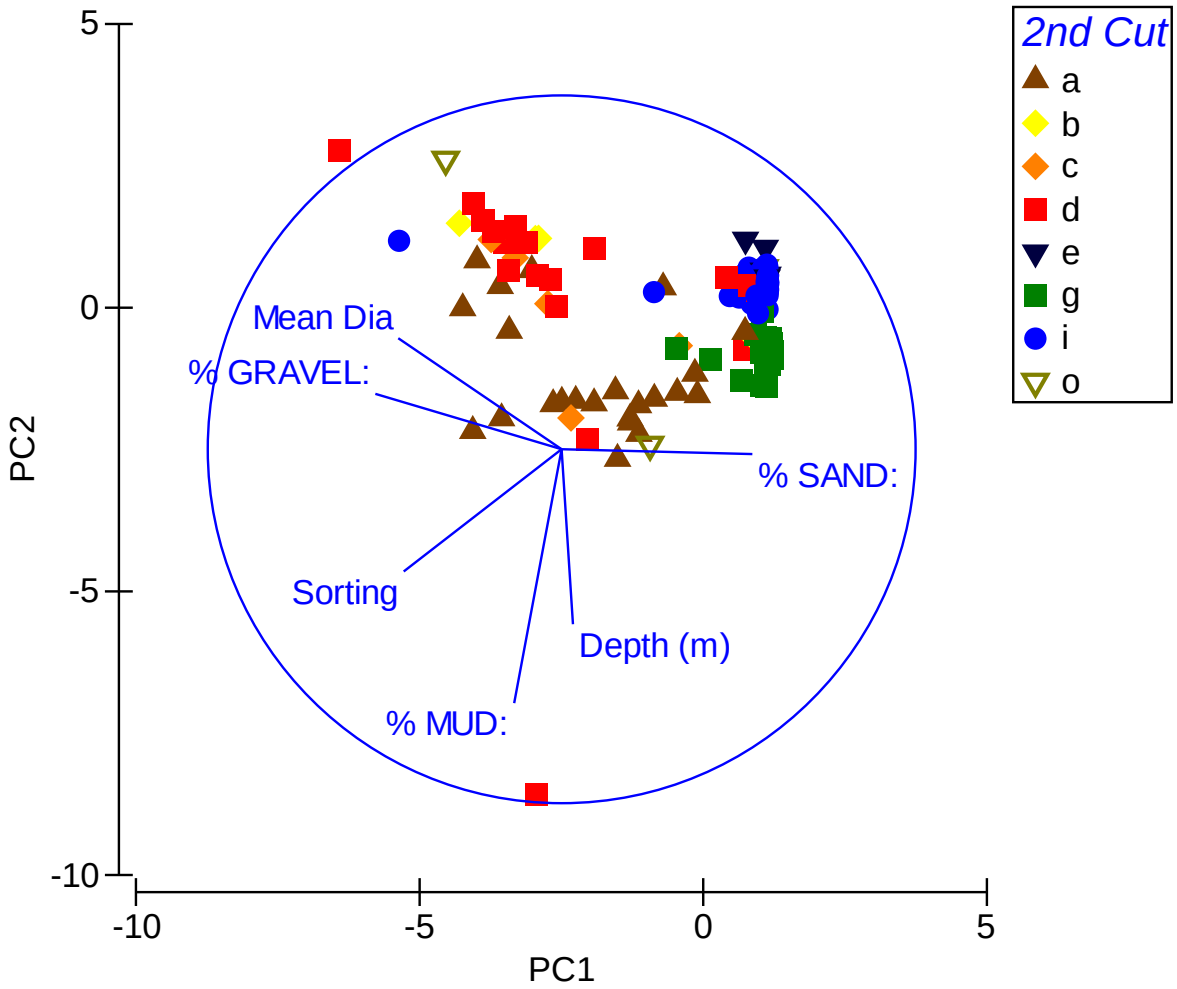


Figure 3.21 **Site and cluster relationship to environmental variables based on PCA analysis.**

3.4.18. The communities derived from the PRIMER analysis were overlaid onto a chart of the area (Figure 3.22 and an A3 chart (Chart 7) is provided in Appendix V). The different clusters are summarised as follows, with reference to the cluster designation to enable quick reference to the distribution figure:

- Cluster a – Very high diversity and high abundance community, dominated by mixture of polychaetes including encrusting species such as *Pomatoceros* spp. and the reef building species *Sabellaria spinulosa.* Sediments suggest mixture of gravels, sands and silt;
- Cluster b – Transitional sand based community with components of both clusters d and g most typically represented by the robust, disturbance tolerant polychaete *Ophelia borealis*;
- Cluster c – High diversity, high abundance, dominated by robust and coarse sand dwelling polychaetes, with increased diversity due to mixture of gravels and silts;
- Cluster d – Moderate diversity, high abundance, dominated by a characteristic group of coarse sediment tolerant polychaeta and echinoderms, with the additional and notable presence of the lancelet *Branchiostoma lanceolatum*;
- Cluster e – Very low diversity, low abundance, sand based polychaete and crustacean dominated community. Fauna typical of mobile sands in relatively shallow waters;
- Cluster i – Shallow water sandy habitat, with low diversity and low abundance, supporting species tolerant of mobile sands, characterised by *Bathyporeia elegans* and *Magelona johnstoni* with the robust bivalve *Fabulina fabula* also evident in abundance;
- Cluster g – Deep water sandy sediments with small percentage of fine sediment. Moderately high species number and generally moderate abundance. Typified by burying echinoderms (*Amphiura filiformis* and heart urchins), as well as a diverse range of sand dwelling phoronids, polychaetes, crustacea and bivalve molluscs; and
- Outlier sites mostly typified by *Mytilus edulis* and associated diverse epifauna.

3.4.19. The four major clusters show a reasonable degree of spatial separation (**Figure** 3.22), with the two largest groups g and i, divided roughly between the deep water offshore Export Cable Corridor (g) and the shallow water Tranche A (i). A distinct inshore group of sites occurred, occupied by cluster a sites, where sediments were mixed and the fauna diverse as a consequence. Adjacent to this group of sites were the transitional sand habitats of cluster b, with the inshore end of the cable supporting cluster e, which was comprised of very low diversity mobile sand fauna.

3.4.20. Mixed in with the sites from cluster i in Tranche A were numerous sites from cluster d and cluster c, where the initial side scan sonar data has indicated a degree of variability in seabed composition. This variation corresponded to the siltier sites of cluster c found on the southern edge of the area; the mixed gravels and sands of cluster d, generally on the periphery of the area, but most extensively in the north west; and the exclusively sand sediments of Cluster i, which, although present across the whole of Tranche A, were found almost to the exclusion of the others in the central and eastern parts of the region. Also of note in the Tranche A area were several of the sites from cluster e, comprising the low diversity shallow water mobile sand fauna, also found in the two most inshore sites. The mussel based outlier sites were located inshore between the mobile sand habitats.

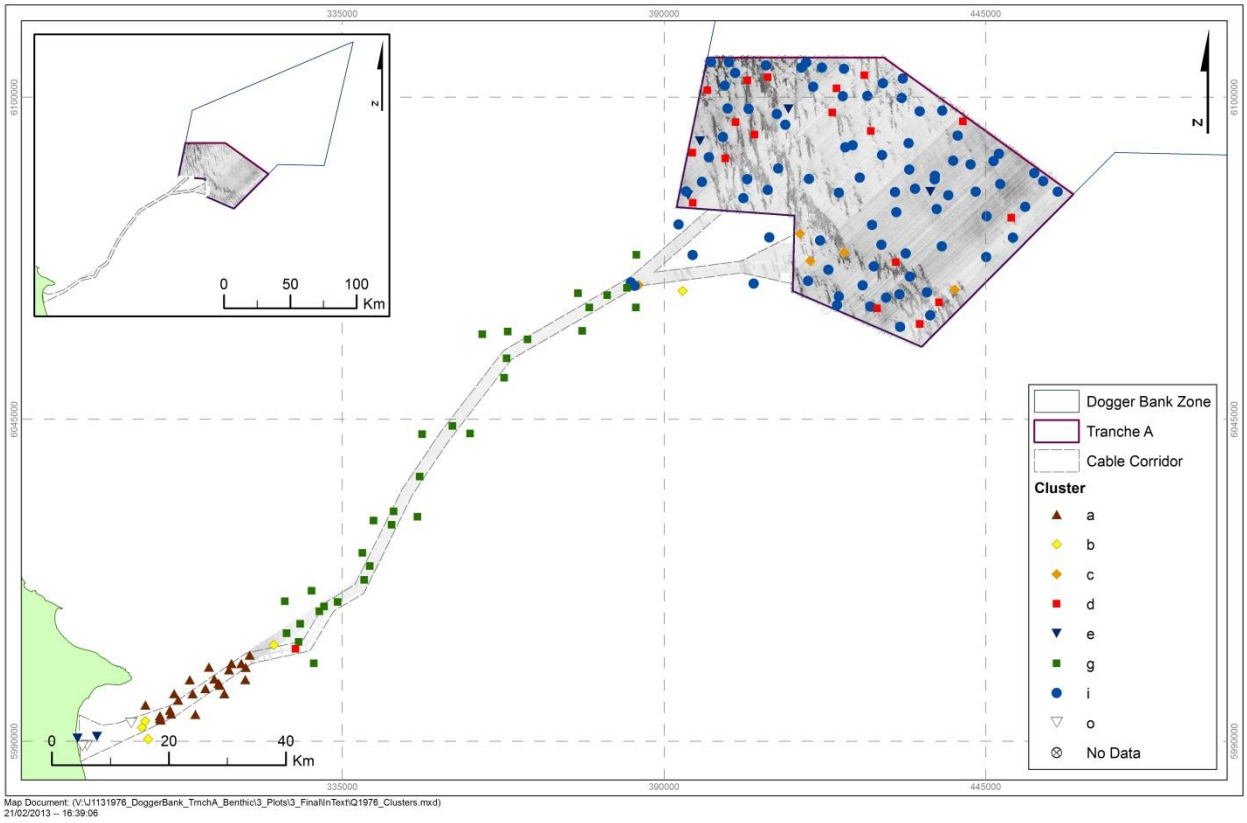


Figure 3.22 Overlay of benthic communities derived from PRIMER analysis.

3.5. Video and image results.

3.5.1. Analysis of the video data is presented in Appendix VI. These have been summarised to identify numbers of individual biotopes, as well as numbers of biotope complex and habitats. Due to the overlapping nature of the video transects (i.e. physically overlapping) in many cases mosaics of biotopes have been defined. The occurrence of individual biotope, biotope complexes and habitats has been summarised in Table 3.7 including those in mosaics. Of the biotopes identified, the majority fell within SS.SSa at the habitat level, most of which were IFiSa. A large proportion of the SS.SSa samples were also found in the Export Cable Corridor as CFiSa. The SS.SMx.CMx biotope complex was the next most frequently occurring, more or less equally spread across the Tranche A sites and the cable route. Although hard and mixed ground areas existed, they were infrequent.

Table 3.7 Summary of biotopes identified and percentage occurrence (including occurrence in mosaics).

Biotope code	No. Tranche A	No. Cable Route	% Tranche A	% Cable Route	% Total
SS.SSa	6	25	5%	20%	13%
SS.SSa.IFiSa	74	3	64%	2%	32%
SS.SSa.CFiSa	4	41	3%	33%	19%
SS.SCS.ICS	0	4	0%	3%	2%

SS.SCS.CCS	5	3	4%	2%	3%
SS.SMx	1	2	1%	2%	1%
SS.SMx.IMx	0	3	0%	2%	1%
SS.SMx.CMx	23	23	20%	19%	19%
SS.SMx.CMx.FluHyd	3	14	3%	11%	7%
SS.SMx.CMx.OphMx	0	1	0%	1%	0%
CR.HCR.XFa	0	2	0%	2%	1%
SS.SBR.SMus	0	2	0%	2%	1%

3.5.2. Distributional data with respect to biotopes derived from the video survey have not been presented as these will be considered subsequently, including interpretation of the geophysical data such that mapped outputs may be produced (see Envision, 2012).

3.6. Species of conservation importance

3.6.1. The following considers only specific species rather than biotopes or habitats, as the latter two are included in Envision (2012), combined with the geophysical data outputs.

Ocean quahog Arctica islandica

3.6.2. Ocean quahog, the long living bivalve mollusc, is on the OSPAR list of threatened species as agreed at the OSPAR convention for the protection of the marine environment of the North East Atlantic, 2008. Only one juvenile specimen was recorded from site TA_CAM_031 (within Tranche A).

Lesser sandeel Ammodytes marinus

3.6.3. The lesser sandeel is listed as a species 'of principal importance for the purpose of conserving biodiversity', covered in England only under the NERC Act 2006 and, therefore, needs to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity. It is also listed as a declining UK BAP priority species. Two specimens were recorded from site TA_CAM_095 (within Tranche A), but the true spatial extent of the mobile species cannot be estimated because the grab sampling methodology is not optimal for sampling the species and currently no other data are available.

4. CONCLUSIONS

4.1. Physical conditions.

4.1.1. Three principal sediment types were identified across the region comprising:

- Substantially sand based sites (classified using Folk as slightly gravelly sand and gravelly sand) with the most common particle size falling within the range of fine sand. These sites extended across both the Tranche A area and along the Export Cable Corridor;
- Gravel based sites (classified using Folk as sandy gravel and gravel) with the most common particle size falling within the fine gravel range. These sediments were found extensively across the Tranche A sites as well as in discrete areas of the export cable route in the nearshore area; and
- Mixed sediment types, but generally with notable proportions of mud (classified using Folk as muddy sandy gravel, gravelly muddy sand and slightly gravelly muddy sand). These sediments were found primarily in the Tranche A sites and in several of the nearshore sites along the export cable.

4.1.2. The depth conditions followed a clear trend with the central section of the cable route existing in deep waters and most of the Dogger Bank sites, including the Tranche A and the nearshore sites, in shallow waters. There are a considerable number of bathymetric features around the western and southern edges of Tranche A, which correspond with the areas of coarse and mixed substrata. The mixture of coarse and mixed substrata with areas of sand, including sand waves evident from the geophysical survey data, suggests a high level of hydrodynamic influence. Admiralty charts indicate that tidal stream speed maxima for the Dogger Bank Zone are between 0.2 m/s and 0.6 m/s, with the higher speeds present in Tranche A, associated with the flow of water around the western edge of the Dogger Bank (EMU, 2010a), as described in Section 1.1.4. In contrast, the deeper water sands found along the cable route appear to comprise relatively stable fine sands, which suggest lower levels of hydrodynamic disturbance.

4.1.3. Small outcrops of coarser sediment, including potential cobble outcrops have been identified from the video data. Output from these analyses will be assessed in combination with geophysical survey interpretation to identify if any extensive areas of this substrate type exist (see Envision, 2012).

4.1. Contamination

4.1.1. Numerous sites were identified where levels of contamination for one or more of the contaminants were above either UK (Action level 1) or EPA (Effects Range Low) quality guidelines. These related predominantly to metals levels, with all of the nearshore Export Cable Corridor sites sampled for contaminants, plus site CABA_23 in the Export Cable Corridor, having contaminant levels above Action level 1 for several of the metals including Arsenic, Chromium, Lead and Nickel. Levels of Nickel were also above EPA (Effects Range Medium) in the Export Cable Corridor area in site CABA_23, and 3 nearshore sites. Several of the nearshore sites also supported raised levels of micro-organic pollutants, including C1-4 Naphthalene, at levels above OSPAR guidelines. The source of contamination at this site, however, is not evident from the data currently available and levels are comparable to those previously recorded in the local area (BODC website).

4.2. Benthic fauna

4.2.1. A number of studies have broadly characterised the North Sea benthos and their associated habitats (Glémarec, 1973; Kröncke and Reiss, 2007; Rees *et al.*, 2007). Tranche A is predominantly within the southern North Sea and contains a variety of benthic community types associated with the strongly thermally-mixed waters present all year round (EMU, 2010a).

4.2.2. Benthic surveys have been conducted at two discrete areas on the Dogger Bank in support of aggregate extraction applications. These included grab, trawl and seabed video surveys at Northwest Rough (Area 466) (EMU, 2002), in close proximity to the northern edge of Tranche A, and Southernmost Roughs (Area 482) (EMU, 2005). Data were used to characterise seabed habitats and communities to inform respective EIAs.

4.2.3. The dominant biotope associated with the Dogger Bank from previous surveys was SS.SSa.IFiSa.NcirBat (*Nephtys cirrosa* and *Bathyporeia* spp. in infralittoral sand) (EMU, 2010a). This biotope was thought to cover the majority of the Dogger Bank Zone, including areas comprising more mixed sediment types, based on habitat maps published in Diesing *et al.* (2009), as well as the EUNIS map (Figure 1.2) This community type corresponds well with the 'Bank' community described by Wieking and Krönke (2001), which occupies the flat shallow seabed areas on top of the Dogger Bank and overlaps central and southern areas (e.g. the area of Tranche A) of the Dogger Bank Zone (EMU, 2010a).

4.2.4. The current study confirms the range of community types anticipated from the Dogger Bank, within the Tranche A area. Much of the central area of Tranche A was dominated by both fine sands and mixed sediments, supporting a mixture of communities. The PRIMER analysis indicated that the sites within this area were within a continuum of species and communities, with several, more or less discrete groups evident. These groups corresponded with differences in the physical character of the area, ranging from predominantly sand areas, some of which appear to indicate a degree of instability, to sandy gravels and mixed sediments including sand and gravel with a significant proportion of silt.

4.2.5. From the analysis, the three main groups of sites derived within Tranche A indicated clear associations of fauna with the prevailing physical conditions. The coarse sandy gravels supported an association of species comprising; *Polygordius* sp., *Protodorvillea kefersteini, Notomastus* sp., *Echinocyamus pusillus* and notably *Branchiostoma lanceolatum.*

4.2.6. The heterogeneous sediments supported a high diversity community relative to the other sites, including a variety of taxonomic groups, which are clearly exploiting the additional niches provided by the differing sediment types. The species that typified the sites included *Pomotoceros* spp., *Scalibregma inflatum* and *Mediomastus fragilis* , in combination with the bivalve *Mysella bidentat.*

4.2.7. The most extensively present group across Tranche A was comprised of a sand based community, with the sites dominated overall by *Spiophanes bombyx.* Several other species were characteristic of the sites, including *Bathyporeia elegans, Nephtys cirrosa, Magelona johnstoni* and *Fabulina fabula.* These species were present in a variety of combinations and it is evident that these formed part of a complex of communities. In general the greatest levels of variation were evident on the banks of the Dogger Bank with the central area substantially occupied by one community represented by Cluster i.

4.2.8. The Export Cable Corridor may be split into three distinct regions based on the cluster analysis. In general, the offshore segment of the Export Cable Corridor was similar to the main Tranche A area, falling substantially on the Dogger Bank. The community type was dominated by the combination of species found in Cluster i. This same community type was also found at several locations in the inshore region in addition to a significant area found to support cluster a – a very high diversity and high abundance community, dominated by mixture of polychaetes including encrusting species such as *Pomatoceros* spp. and the reef building species *Sabellaria spinulosa* (cluster a).

4.2.9. The remainder of the Export Cable Corridor was comprised of the sites that fell within the g cluster, characterised by burrowing echinoderms, including *Amphiura filiformis.* The community found in these *Amphiura filiformis* dominated sites is probably equivalent to the infralittoral etage described by Glemarec (1973) and part of the 'offshore muddy sand association' described by other workers (Jones, 1951; Mackie, 1990).

4.3. Video interpretation and biotopes

4.3.1. The interpretation of the video data and identification of habitats and associated species has resulted in broadly similar conclusions to those reached for the grab sampling.

4.3.2. The overall interpretation, confirms the occurrence of a deep water, fine sand based environment along the majority of the Export Cable Corridor. At either end of the Export Cable Corridor, a greater degree of habitat complexity was identified, with potential hard ground and cobble/boulder outcrop evident in the inshore areas (of this report), along with evidence of *Ophiothrix* beds. The complexity at the offshore end of the Export Cable Corridor corresponds with its arrival onto the Dogger Bank and is primarily related to the occurrence of more complex mixed and coarse sediments.

4.3.3. The top of Dogger Bank, within the Tranche A area, was primarily composed of fine sands interspersed, to the south and west, with mixed and coarse sediments, corresponding with the pronounced features on the geophysical data images. Greater consideration of these ecological data will be possible once the geophysical data has been fully interpreted.

4.4. Features of conservation importance

4.4.1. With regard to current nature conservation legislation two protected species were recorded, being the ocean quahog and lesser sandeel. For the ocean quahog, as only a single juvenile specimen was found, it was thought that the conservation status of the species would not be affected by development. Though two specimens of the lesser sandeel were recorded, future speculation could not be made on the status of the population, as the sampling methodology was not sufficient to correctly record this mobile species.

4.4.2. Assessment of the Annex 1 habitats will follow interpretation of the biotope definition and distribution based on review of the geophysical data and merging with the current benthic and video data.

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APPENDIX I Grab logs and quality records

APPENDIX I GRAB LOG AND INVENTORY

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Site No.	Date	Time (GMT)	Depth (m BSL)	UTM WGS84 Z31 N		Fauna (volume L)	PSA	Photograph of sample?	*In-situ* sediment description	Conspicuous Fauna
				Eastings	Northings					
CABA_GRAB_01	25/06/2011	07:46	43.2	385659.2	6067935.1	6	Yes	Yes	Mixed sediment with silts and large shell fragments.	Fish, bivalve.
CABA_GRAB_02	25/06/2011	06:57	42.3	384975.7	6067756.6	6	Yes	Yes	Fine to medium sand with a few shell fragments.	Bivalve.
CABA_GRAB_03	25/06/2011	05:36	41.4	384321.8	6068325.6	5	Yes	Yes	Fine silty sands with shell fragments.	Polycheates.
CABA_GRAB_04	25/06/2011	03:28	42.1	383666.0	6067422.7	5	Yes	Yes	Fine brown sand with some shell fragments and silt.	Urchin.
CABA_GRAB_05	23/06/2011	15:31	46.8	380306.8	6066154.4	5	Yes	Yes		
CABA_GRAB_06	23/06/2011	12:36	49.2	377249.8	6064063.5	5	Yes	Yes	Fine brown sand with small shell fragments. Lower layer slightly darker. Slight odour.	Hermit crab, sea potatoes and polychaetes.
CABA_GRAB_07	23/06/2011	09:13	57.6	366703.3	6058609.9	6	Yes	Yes	Coarse sands present or very fine silty sand shell fragments.	Bivalves and sea urchin.
CABA_GRAB_08	23/06/2011	07:40	67.5	363127.9	6055393.5	5	Yes	Yes	Fine dark silty sand.	Sea potato.
CABA_GRAB_09	23/06/2011	04:51	61.7	353866.1	6043830.8	5	Yes	Yes	Fine sands and silt with a few shell fragments.	Starfish, polychaete and shrimp.
CABA_GRAB_10	23/06/2011	02:47	59.8	348237.8	6035181.3	5	Yes	Yes	Fine sands and silt with a few shell fragments.	Sea potato, crab and worms.
CABA_GRAB_11	23/06/2011	00:53	67.9	343789.9	6029264.9	5	Yes	Yes	Fine brown sands with shell fragments.	
CABA_GRAB_12	22/06/2011	23:15	67.3	343450.6	6026946.4	5	Yes	Yes	Fine brown sands with small shell fragments.	
CABA_GRAB_13	22/06/2011	20:50	63.6	339699.8	6019901.2	5	Yes	Yes	Fine brown sand with a few small shell fragments.	Sea potato, arthropods and polychaetes.
CABA_GRAB_14	22/06/2011	19:41	63.8	338750.9	6017561.0	8.5	Yes	Yes	Fine brown sand with small shell fragments.	Polychaete.
CABA_GRAB_15	22/06/2011	16:24	60.6	334241.5	6013773.1	5	Yes	Yes	Brown silty sands with fine shell hash and small shells. Grey/brown	*Nephtys* sp.
CABA_GRAB_16	22/06/2011	14:36	52.5	331908.2	6013010.5	5	Yes	Yes	Brown sands and silt with shells and shell fragments. Slight odour.	Poss. indet. arthropod, brittlestars, shrimp, bivalves, sea potatoes and *Sabellaria* fragments.
CABA_GRAB_17	22/06/2011	12:37	60.7	331114.4	6012182.5	5	Yes	Yes	Fine sands with shell fragments.	2 x sea potatoes.
CABA_GRAB_18	22/06/2011	11:19	59.8	327836.6	6010055.9	5	Yes	Yes	Fine sands with shell fragments and small shells.	
CABA_GRAB_19	22/06/2011	08:50	57.8	327572.1	6006972.1	6	Yes	Yes	Fine sands with shell fragments.	
CABA_GRAB_20	22/06/2011	10:04	59.5	325514.4	6008458.9	5	Yes	Yes	Fine sands with shell fragments.	Worms.
CABA_GRAB_21	22/06/2011	07:44	58.7	327037.4	6005796.8	10	Yes	Yes	Fine sands with a shell, Sabellaria hash and a large cobble.	Worms.
CABA_GRAB_22	22/06/2011	03:11	56.2	323305.1	6006405.3	4	Yes	Yes	Coarse sands, dark brown in colour, with cobbles, bivalves and polychaetes.	
CABA_GRAB_22	22/08/2011	00:02	57.2	323305.1	6006447.6	5	Yes	Yes	Fine-medium sand with some shell fragments. no odour. Dk grey/brown/olive. 2.5YR 4/2.	
CABA_GRAB_23	22/06/2011	00:29	8.2	319188.3	6004716.7	5	Yes	Yes	Mixed sediments from fine silty sand to coarse gravel with cobble.	*Flustra foliacea* , *Alcyonium digitatum* , indet. crabs, annelids and poss. anenomes.
CABA_GRAB_24	25/08/2011	20:21	24.8	408008.4	6076052.4	10	Yes	Yes	Fine -Medium Sand with few shell fragments. No Odour. 2.5Y 4/2.	*Echinocardium cordatum* .
CABA_GRAB_26	25/08/2011	21:19	28.2	405337.3	6068157.1	10	Yes	Yes	Fine-Medium olive/brown Sand with few shell Fragments. No Odour. 5Y 4/1.	*Echinocardium cordatum* .
CABA_GRAB_29	25/08/2011	23:42	30.2	392480.0	6078235.1	7	Yes	Yes	Fine - medium Dk brown Sand with somel shell fragments and some anoxic sediments. 2.5Y 4/2.	
CABA_GRAB_32	25/08/2011	22:59	27.2	394880.6	6073039.4	11	Yes	Yes	Fine - medium Dk brown Sand with small shell fragments and some anoxic sediments. 2.5Y 4/2.	
CABA_GRAB_35	25/08/2011	22:17	34.1	393162.9	6066929.2	11	Yes	Yes	Fine-Medium Sand with some shell fragments and ripples of anoxic	*Echinocardium cordatum* .
CABA_GRAB_36	26/08/2011	00:26	45.0	385278.1	6073058.2	9	Yes	Yes	Fine - medium Sand with some shell fragments. No Anoxic sediments. 2.5Y 4/3.	
CABA_GRAB_39	26/08/2011	02:05	46.9	385227.4	6064072.7	5	Yes	Yes	Medium - coarse Sand with Gravel, larger cobbles. Dk Brown. 2.5Y 3/2.	*Alcyonium digitatum* on large cobbles.
CABA_GRAB_41	26/08/2011	04:47	51.4	375285.1	6066518.2	8	Yes	Yes	Fine - medium Sand with silt with some shell fragments. No anoxic sediments. Dk brown 2.5Y 4/4.	

Site No.	Date	Time (GMT)	Depth (m BSL)	UTM WGS84 Z31 N		Fauna (volume L)	PSA	Photograph of sample?	*In-situ* sediment description	Conspicuous Fauna
				Eastings	Northings					
CABA_GRAB_42	26/08/2011	02:57	50.1	376032.9	6060093.1	7	Yes	Yes	Fine - medium Sand with some shell fragments. Dk Brown. 2.5Y 3/2.	Sea Mouse (*Aphrodita aculeata*) not in sieve photo, *Echinocardium cordatum* .
CABA_GRAB_45	26/08/2011	06:42	67.0	363300.3	6059975.6	7	Yes	Yes	Fine Sand with silt and some clay. Some anoxic sediments. Dk brown 2.5Y 4/3.	
CABA_GRAB_47	26/08/2011	07:25	72.0	358957.1	6059501.0	7	Yes	Yes	Fine Sand with Silt and some clay. Some anoxic sediments. Dk	
CABA_GRAB_48	26/08/2011	08:23	63.0	362707.8	6052089.1	7	Yes	Yes	Fine Sand with Silt and som Clay. Some anoxic sediments. Dk brown. 2.5Y 4/3.	
CABA_GRAB_51	26/08/2011	09:19	58.1	356865.1	6042564.3	8	Yes	Yes	Fine Sand with Silt and some Clay. Some anoxic sediments. Dk brown. 5Y 4/3.	
CABA_GRAB_53	22/08/2011	09:59	62.5	348655.1	6042435.1	4	Yes	Yes	Fine-medium sand with some shell fragments. No Odour. Dk brown/olive. 5Y /4/2.	
CABA_GRAB_57	26/08/2011	10:42	64.9	347865.6	6028352.7	11	Yes	Yes	Fine Sand with Silt and some Clay. Some anoxic sediments. Dk brown. 5Y 4/3.	
CABA_GRAB_58	26/08/2011	11:24	67.5	340379.6	6027693.9	5.5	Yes	Yes	Fine-medium Dk brown/grey Sand with some grey Silt. 'Very dark Grey. 5Y 3/1.	
CABA_GRAB_61	26/08/2011	12:00	61.0	338450.9	6022151.1	7	Yes	Yes	Dk olive/brown Fine - Medium Sand with ripples of Grey Silt. Slight organic odour. Very few shell fragments. 5Y 4/3.	
CABA_GRAB_63	21/08/2011	21:05	61.4	338685.1	6014409.2	5	Yes	Yes	Fine-medium sand with some shell fragments. No odour. Dk grey/brown. 10Y 3/2.	
CABA_GRAB_65	21/08/2011	22:14	61.7	329774.8	6015681.2	5	Yes	Yes	Fine-medium sand with some shell fragments. Firm, stiff. No odour. Dk brown/grey. 5Y 4/1.	
CABA_GRAB_67	21/08/2011	22:59	59.5	325193.7	6013895.1	7	Yes	Yes	Fine-medium sand with some shell fragments, gravel and pebbles. No odour. Dk brown/grey. 5YR 3/1.	
CABA_GRAB_68	22/08/2011	01:15	56.1	330161.0	6003320.9	4.5	Yes	Yes	Fine-medium sand with some shell fragments. No Odour. Dk Brown/grey. 2,.5Y /3/2.	
TA_GRAB_01	26/05/2011	19:48	24.5	451732.7	6081253.5	5	Yes	Yes	Fine brown sand.	Sandeel, urchin, shell fragments.
TA_GRAB_02	26/05/2011	21:00	23.9	449368.2	6079388.1	5	Yes	Yes	Gravel with small cobbles, shells.	
TA_GRAB_03	31/05/2011	21:05	24.0	449646.0	6076000.7	7	Yes	Yes	Fine brown sand with frequent shell fragments.	Polychaetes.
TA_GRAB_04	26/05/2011	02:50	25.3	447456.5	6085143.1	5	Yes	Yes	Fine to medium brown, lots of shell material.	No obvious fauna.
TA_GRAB_05	31/05/2011	19:58	23.0	445154.6	6079667.1	6	Yes	Yes	Fine brown sand with frequent shell fragments.	Polychaetes.
TA_GRAB_06	31/05/2011	22:20	21.3	445057.3	6072695.1	5	Yes	Yes	Fine brown sand, some shell fragments.	Live bivalves.
TA_GRAB_07	31/05/2011	03:31	28.1	447256.5	6090328.7	6	Yes	Yes	Fine brown sand, frequent shell fragments.	Polychaete tubes.
TA_GRAB_08	25/05/2011	21:02	28.9	453301.5	6087019.9	7	Yes	Yes	Fine brown sand with shell fragments.	*Ensis* sp., worm tubes.
TA_GRAB_09	25/05/2011	20:15	26.8	454817.4	6085628.6	6	Yes	Yes	Fine sand with shell fragments, occasional gravel.	*Ensis* sp.
TA_GRAB_10	30/05/2011	23:16	26.3	437578.9	6097691.5	7	Yes	Yes	Fine golden brown sand, few shell fragments, bivalve shell.	Gastropod.
TA_GRAB_11	31/05/2011	01:34	27.3	440185.6	6093399.7	5	Yes	Yes	Fine brown sand with few shell fragments.	Polychaete.
TA_GRAB_12	31/05/2011	02:31	26.5	442389.5	6088494.7	6	Yes	Yes	Fine brown sand with some fine gravel and coarse sand. Some shell fragments.	*Ensis* sp.
TA_GRAB_13	31/05/2011	18:54	24.8	443275.7	6083854.3	6	Yes	Yes	Fine brown sand, few shell fragments.	Polychaete.
TA_GRAB_14	10/06/2011	02:03	23.6	431917.0	6087624.1	6	Yes	Yes	Sand with shells and shell fragments.	Urchin and razor.
TA_GRAB_15	10/06/2011	21:52	26.7	425554.1	6078180.7	7	Yes	Yes	Fine brown sand with shell fragments.	Razor clam, annelids.
TA_GRAB_16	09/06/2011	19:43	24.1	437494.9	6074499.0	7	Yes	Yes	Fine brown sands, shell fragments.	Worms presents and worm casks.
TA_GRAB_17	11/06/2011	01:47	25.9	423463.4	6086246.7	6	Yes	Yes	Fine brown sand with a few small shell fragments.	Unidentified crab sp.
TA_GRAB_18	09/06/2011	21:14	25.6	436303.4	6086537.3	8	Yes	Yes	Sand with shells and shell fragments.	
TA_GRAB_19	09/06/2011	22:16	25.0	438592.8	6083252.6	7	Yes	Yes	Sand with shells and shell fragments.	Urchin and polycheates.
TA_GRAB_20	10/06/2011	00:56	23.9	432914.4	6084343.4	6	Yes	Yes	Brown sand with shells and shell fragments.	Urchin and bivalves.
TA_GRAB_21	09/06/2011	20:24	23.5	436597.8	6080866.8	5	Yes	Yes	Fine brown sand with shell fragments.	Bivalves.
TA_GRAB_22	09/06/2011	23:19	24.6	435512.2	6083852.5	7	Yes	Yes	Golden sand with shell frags and shells.	
TA_GRAB_23	01/06/2011	00:14	32.9	439711.3	6067139.3	8	Yes	Yes	Layer of coarse gravel over fine shelly sand with some silt forming a soft clay.	No obvious fauna.

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				Eastings	Northings					
TA_GRAB_24	11/05/2011	20:00	30.9	437009.7	6064948.2	8	Yes	Yes	Fine sand to small cobbles with shell fragments.	Calcareous tube worms.
TA_GRAB_25	11/05/2011	20:30	28.2	435496.1	6062747.7	8	Yes	Yes	Fine brown sand with shell fragments.	Large crab.
TA_GRAB_26	11/05/2011	20:57	29.7	433717.0	6061263.8	7	Yes	Yes	Fine to medium gravel with some fine material.	
TA_GRAB_27	11/05/2011	22:44	31.8	430238.5	6066326.9	7	Yes	Yes	Fine brown sand, some evidence of anoxia, some shell fragments.	No obvious fauna.
TA_GRAB_28	10/06/2011	20:52	30.6	427142.2	6074797.1	7	Yes	Yes	Fine brown sand with shell fragments.	Urchin, annelids.
TA_GRAB_29	11/05/2011	19:16	30.8	434915.7	6066659.6	5	Yes	Yes	Fine brown sand with shell fragments.	No obvious fauna.
TA_GRAB_30	01/06/2011	01:28	33.5	432032.3	6069338.6	6	Yes	Yes	Very fine brown sand with silt.	Possible platyhelminth.
TA_GRAB_31	01/06/2011	03:27	34.7	429624.5	6071804.7	7	Yes	Yes	Silt through fine sand and fine to medium gravel. Formed loose, watery agglomerative masses which were grainy to the touch. Also shells and fragments of assorted sizes.	Swimming crab, 2 x mud shrimp, 2 x urchin.
TA_GRAB_32	01/06/2011	02:55	27.2	425863.4	6071090.0	5	Yes	Yes	Fine brown sand, occasional gravel and shell fragments.	*Ensis* sp., *Spirobranchus* sp. tubes, other polychaete tubes (sand construction).
TA_GRAB_33	11/05/2011	23:29	29.4	427973.6	6065734.0	5	Yes	Yes	Fine Brown sand, some shell fragments, some evidence of anoxia.	
TA_GRAB_34	11/05/2011	22:05	26.8	430360.7	6060770.2	10	Yes	Yes	Fine brown sand, some evidence of anoxia, some shell fragments.	Echinoderms, annelids.
TA_GRAB_35	12/05/2011	01:37	27.0	425261.0	6064242.4	5	Yes	Yes	Fine brown sand with some shell fragments, 1 cobble.	
TA_GRAB_36	12/05/2011	02:55	23.7	419888.3	6065939.0	7	Yes	Yes	Fine Brown sand with shell fragments.	Polychaetes, 1/2 an urchin.
TA_GRAB_37	10/06/2011	18:04	23.0	414619.6	6068620.8	6	Yes	Yes	Sand with small shell fragments.	Sea potato, sand eel, polychaetes, bivalves.
TA_GRAB_38	14/06/2011	20:45	25.7	413259.8	6076665.5	8	Yes	Yes	Gravel and cobbles with a sandy matrix.	*Flustra* sp., bivalves, annelids, keelworms.
TA_GRAB_39	14/06/2011	19:51	23.2	416689.5	6075491.0	9	Yes	Yes	Brown sand with small shell fragments.	Annelid casts.
TA_GRAB_40	10/06/2011	19:31	28.8	420780.6	6073453.6	8	Yes	Yes	Well mixed gravels and cobbles with a sandy clay matrix.	Bivalves, annelids, possible sea mouse, keel worms, hydroid.
TA_GRAB_41	12/05/2011	02:17	27.8	423969.8	6067829.1	7	Yes	Yes	Fine brown sand with some shell fragments, patches of anoxia.	*Ensis* sp., urchin, polychaete.
TA_GRAB_42	10/06/2011	18:39	25.3	418093.5	6070510.1	6	Yes	Yes	Sand with shells and small shell fragments.	
TA_GRAB_43	06/06/2011	21:21	26.7	394104.3	6083256.3	8	Yes	Yes	Fine brown sand with shell fragments. No odour.	Bivalve and broken urchin.
TA_GRAB_44	06/06/2011	22:47	28.4	396497.1	6085545.3	7	Yes	Yes	Fine brown sand with shells and shell fragments.	Bivalves and urchin.
TA_GRAB_45	02/06/2011	04:04	28.8	396093.7	6092514.3	8	Yes	Yes	Medium brown sand with small fraction of coarse sand (approx 1mm diameter).	Urchin, polychaete.
TA_GRAB_46	02/06/2011	03:06	27.7	397670.6	6089706.7	6	Yes	Yes	Fine brown sand, occasional shell fragments.	*Ensis* sp.
TA_GRAB_47	30/05/2011	22:16	25.8	433706.1	6097580.2	7	Yes	Yes	Fine brown sand, occasional shell fragments.	Polychaete.
TA_GRAB_48	30/05/2011	21:16	25.1	430622.4	6099864.9	8	Yes	Yes	Fine brown sand, occasional shell fragments.	*Ensis* sp.
TA_GRAB_49	08/06/2011	22:23	30.2	427444.4	6102360.3	5	Yes	Yes	Fine brown sand.	
TA_GRAB_50	08/06/2011	21:10	32.7	424260.7	6103754.5	10	Yes	Yes	Coarse gravels, few shell fragments.	Flatworms
TA_GRAB_51	16/06/2011	20:18	29.1	420775.3	6104851.7	6	Yes	Yes	Brown/dark brown fine sand with a few small shell fragments.	*Ensis* sp., sea potato.
TA_GRAB_52	16/06/2011	21:20	32.3	416994.1	6105050.2	8	Yes	Yes	Dark brown fine sand with a few small shell fragments.	*Astropectin irregularis* , sea potato.
TA_GRAB_53	16/06/2011	22:57	32.0	413506.2	6105046.3	8	Yes	Yes	Fine brown sand with a few small shell fragments.	Annelids.
TA_GRAB_54	16/06/2011	01:20	30.9	415498.2	6101763.3	6	Yes	Yes	Fine brown sand with very fine shell fragments.	Sand eel.
TA_GRAB_55	16/06/2011	00:48	28.3	418781.6	6097377.7	7	Yes	Yes	Coarse sand and shell hash with some cobbles.	Sand eel.
TA_GRAB_56	11/06/2011	02:43	25.7	420970.9	6091421.9	6	Yes	Yes	Fine brown sand with shells and shell fragments.	
TA_GRAB_57	08/06/2011	23:36	27.3	424761.2	6100185.4	6	Yes	Yes	Fine brown sand.	
TA_GRAB_58	11/06/2011	03:35	28.4	425360.3	6094198.9	7	Yes	Yes	Brown sandy clay with shells and shell fragments. Mudstone present.	
TA_GRAB_59	12/05/2011	19:54	26.7	427262.5	6090113.0	5	Yes	Yes	Fine brown sand with shell fragments.	Urchin, *Astropecten irregularis.*
TA_GRAB_60	09/06/2011	00:40	30.5	420585.7	6100171.9	7	Yes	Yes	Fine brown sands with shells and shell fragments.	

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				Eastings	Northings					
TA_GRAB_61	12/05/2011	19:21	21.1	431824.5	6092114.1	5	Yes	Yes	Fine brown sand with shell fragments. Some evidence of anoxia.	Worm tubes, annelids, shell fragments.
TA_GRAB_62	01/06/2011	18:15	35.9	397396.0	6101174.8	6	Yes	Yes	Coarse brown sand with shell fragments. Lots of fine gravel.	Possible bivalve, half a sandeel, polychaetes, urchin, lancelet.
TA_GRAB_63	01/06/2011	19:02	33.2	400369.3	6101958.0	8	Yes	Yes	Top 2 cm fine brown sand with shell fragments, with a darker layer of similar sized sand below. No smell of anoxia noted.	Damaged sandeel, urchin.
TA_GRAB_64	24/08/2011	20:33	34.5	404241.6	6102862.3	12	Yes	Yes	Gravel,pebbles and cobbles. No odour. 5Y /4/1/.	Some *Spirobranchus triqueter* on cobbles and possible Nemertean.
TA_GRAB_65	24/08/2011	21:21	34.7	407725.5	6103392.3	7	Yes	Yes	Medium-coarse sand, gravel pebbles and cobbles. No odour. 2.5Y /4/4	5 x Sand eels *Ammodytes tobianus* and some *Spirobranchus triqueter* on cobbles.
TA_GRAB_66	02/06/2011	01:52	31.3	400487.2	6089525.3	8	Yes	Yes	Mixed gravel, predominantly medium sized. Some fines (mud) present.	
TA_GRAB_68	15/06/2011	22:51	22.7	409528.6	6087830.1	7	Yes	Yes	Fine brown sand with very fine shell fragment hash on surface.	
TA_GRAB_70	14/06/2011	23:56	28.4	419873.4	6083652.4	5	Yes	Yes	Fine brown sand with small shell fragments	Unidentified crab.
TA_GRAB_71	25/08/2011	03:13	30.4	410726.4	6095300.2		Yes	Yes	Dk brown/olive fine-medium sand. Some anoxic sediments. 5Y /4/3.	Sand eel.
TA_GRAB_72	01/06/2011	20:03	32.8	400881.0	6098070.5	6	Yes	Yes	Fine brown sand with darker layer below the top 2 cm. Some shell fragments.	
TA_GRAB_73	01/06/2011	22:05	33.5	405493.6	6093617.1	5	Yes	Yes	Fine silty sand to coarse gravel. Predominantly gravel with silty sand in interstitial spaces.	
TA_GRAB_74	15/06/2011	21:50	24.8	407734.1	6084148.0	7	Yes	Yes	Fine brown sand with very fine shell fragments.	Sea potato.
TA_GRAB_75	15/06/2011	20:46	26.7	403557.2	6082755.8	6	Yes	Yes	Fine brown sand with very fine shell fragments.	Razor, annelids.
TA_GRAB_76	12/05/2011	03:17	23.1	419589.1	6064443.9	7	Yes	Yes	Fine brown sand with shell fragments. Some evidence of anoxia.	Urchin, bivalve.
TA_GRAB_77	02/06/2011	00:49	34.4	400081.1	6093199.2	5	Yes	Yes	Medium to fine brown sand.	*Nephtys* sp., shells, polychaetes.
TA_GRAB_78	01/06/2011	23:09	33.5	402240.4	6095736.3	8	Yes	Yes	Fine silty sand to coarse gravel. Predominantly gravel with silty sand in interstitial spaces.	Shrimp, bivalve.
TA_GRAB_79	01/06/2011	20:55	33.9	404448.9	6097973.5	5	Yes	Yes	Fine to medium brown sand, some shell hash.	*Nephtys* sp.
TA_GRAB_80	10/06/2011	22:58	25.0	429730.2	6080355.8	7	Yes	Yes	Fine brown sand with a few small shell fragments.	
TA_GRAB_81	31/05/2011	02:07	25.8	439412.9	6089136.6	6	Yes	Yes	Fine brown sand with shell fragments. Anoxia associated with shell fragments.	Urchin, brittle star, worm tubes.
TA_GRAB_83	01/06/2011	03:48	30.9	431321.8	6073301.0	6	Yes	Yes	Fine to medium brown sand.	*Echinocardium* sp., brittlestar, several polychaetes, gastropod.
TA_GRAB_84	30/05/2011	20:27	31.3	430823.4	6103157.8	7	Yes	Yes	Fine brown sand, few shell fragments, possibly some anoxia.	Damaged urchin, worm tubes.
TA_GRAB_85	25/05/2011	19:23	26.6	457296.2	6083833.7	7	Yes	Yes	Fine brown sand with shell fragments. Some evidence of anoxia.	Polychaete.
TA_GRAB_87	07/06/2011	00:28	29.8	394835.6	6090523.1	10	Yes	Yes	Fine to coarse brown/gold sand with shells and shell fragments.	Sand eel.
TA_GRAB_88	06/06/2011	21:42	27.5	393772.7	6083906.6	6	Yes	Yes	Fine brown sand with shells and shell fragments. No odour.	
TA_GRAB_89	06/06/2011	20:48	28.5	394919.8	6081940.3	10	Yes	Yes	Coarse sand with shells and shell fragments. Mislabelled as 43.	6 sand eels (juv.) and adult.
TA_GRAB_90	24/08/2011	15:56	36.4	398051.2	6105970.4	5	Yes	Yes	Dk olive/brown fine-medium sand. No odour. 5Y /4/3.	

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				Eastings	Northings					
TA_GRAB_91	24/08/2011	19:20	35.0	401079.5	6105952.0	7	Yes	Yes	Dk olive/brown fine-medium sand, some shell fragments, gravel and pebbles. No odour. 5Y /4/4.	
TA_GRAB_92	24/08/2011	19:54	33.6	402166.0	6104135.5	10	Yes	Yes	Dk olive/brown fine-medium sand with few shell fragments. No odour. 5Y /4/1.	*Astropecten irregularis* .
TA_GRAB_93	16/06/2011	23:51	30.6	407430.6	6105411.0	7	Yes	Yes	Fine brown sand with small shells and shell fragments.	*Astropecten irregularis* , annelids, sand eel.
TA_GRAB_94	25/08/2011	01:49	27.8	411250.6	6097954.8	9	Yes	Yes	Dk Brown/olive Fine-medium sand, with very few shell fragments. No odour. 2.5Y 5/3.	Sand eel.
TA_GRAB_95	25/08/2011	02:47	30.1	409297.2	6097118.0	7	Yes	Yes	Dk brown/olive Fine-medium sand. Some anoxic sediments. 5Y /4/4.	Sand eel.
TA_GRAB_96	15/06/2011	01:02	26.7	414772.1	6086029.1	7	Yes	Yes	Fine brown sand with small shell fragments.	Sand eels, annelids.
TA_GRAB_97	15/06/2011	19:41	29.8	404202.7	6085996.8	8	Yes	Yes	Fine brown sand with very fine shell fragments.	Keel worm, *Abra* sp., polychaete.
TA_GRAB_98	24/08/2011	22:12	33.7	414327.6	6105923.9	10	Yes	Yes	Medium-coarse sand. No odour. 2.5Y /3/1.	Sand eel.
TA_GRAB_99	25/08/2011	00:29	30.4	419505.6	6101475.6	8	Yes	Yes	Dk brown/olive Fine-medium sand, with abundant gravel and cobbles. No odour. 2.5Y 4/3.	
TA_GRAB_100	11/06/2011	03:08	26.7	422262.7	6091766.6	6	Yes	Yes	Fine brown sand with shells and shell fragments.	Annelids.
TA_GRAB_101	10/06/2011	23:58	24.0	429494.8	6083788.1	7	Yes	Yes	Fine brown sand with a few small shell fragments.	
TA_GRAB_102	31/05/2011	00:39	31.9	441109.9	6095867.7	10	Yes	Yes	Medium gravel, sand and silts with shell fragments.	*Asterias rubens* , bivalve.
TA_GRAB_103	09/06/2011	20:58	25.0	436246.9	6085930.9	7	Yes	Yes	Sand with shells and shell fragments.	*Ensis ensis* and urchin.
TA_GRAB_104	31/05/2011	03:05	28.5	446310.7	6089084.2	7	Yes	Yes	Fine brown sand through to medium gravel. Very numerous shell fragments.	No obvious fauna.
TA_GRAB_105	12/05/2011	01:02	28.9	426447.7	6063927.0	10	Yes	Yes	Mixed sediment, fine muddy sand to coarse gravel.	Brittlestar, large bivalves.
TA_GRAB_106	10/06/2011	17:27	26.9	415013.6	6072014.7	7	Yes	Yes	Gravel and small cobbles with a sand matrix. Well mixed.	Bivalve, keel worm, poss. sipunculid, annelids.

APPENDIX I GRAB SAMPLE QUALITY

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Site No.	Replicate?	Attempts	Successful sample collected (Y/N)	Brief description of problems with sample	Size of sample retained (L)	Additional Notes on Quality of Retained Samples
CABA_GRAB_02	N	4	Y	Attempts 1-2 did not trigger, attempt 3 was discarded due to small sample size.	6	
CABA_GRAB_03	N	7	Y	Attempts 1 and 3-6 were discarded due to small sample size, attempt 2 did not trigger.	5	
CABA_GRAB_04	N	17	Y	Attempts 1-16 were discarded due to small sample size.	5	
CABA_GRAB_06	N	7	Y	Attempt 1 did not trigger, attempts 2-6 were discarded due to small sample size.	5	
CABA_GRAB_07	N	2	Y	Attempt 1 did not trigger.	7	
CABA_GRAB_08	N	4	Y	Attempts 1-3 were discarded due to small sample size.	5	
CABA_GRAB_10	N	3	Y	Attempt 1 was discarded due to small sample size and attempt 2 did not trigger.	5	
CABA_GRAB_11	N	2	Y	Attempt 1 was discarded due to small sample size.	5	
CABA_GRAB_16	N	4	Y	Attempts 1 and 3 were discarded due to small sample size. Attempt 2 did not trigger.	5	
CABA_GRAB_18	N	2	Y	Attempt 1 was discarded due to small sample size.	5	
CABA_GRAB_21	N	6	Y	Attempts 1-5 were discarded due to small sample size.	10	
CABA_GRAB_22	N	7	Y	Attempts 1-5 were discarded due to small sample size.	4	
CABA_GRAB_39	N	4	Y	Attempts 1-3 were discarded due to small sample size.	5	
CABA_GRAB_47	N	8	Y	Attempts 1-7 were discarded due to small sample size.	7	
CABA_GRAB_48	N	2	Y	Attempt 1 was discarded due to small sample size.	7	
CABA_GRAB_51	N	6	Y	Attempts 1-5 were discarded due to small sample size.	8	
CABA_GRAB_53	N	5	Y	Attempts 1-4 were discarded due to small sample size.	4	
CABA_GRAB_57	N	3	Y	Attempts 1 and 2 were discarded due to small sample size.	11	
CABA_GRAB_58	N	6	Y	Attempts 1-5 were discarded due to small sample size.	5.5	
CABA_GRAB_61	N	5	Y	Attempts 1-4 were discarded due to small sample size.	11	
CABA_GRAB_68	N	8	Y	Attempts 1-7 were discarded due to small sample size.	4.5	
TA_GRAB_02	N	3	Y	Attempts 1 and 2 contained no samples.	5	
TA_GRAB_04	N	3	Y	Attempt 1 contained no sample and attempt 2 discarded due to small sample size.	5	
TA_GRAB_07	N	3	Y	Attempts 1 and 2 discarded due to small sample size.	6	
TA_GRAB_21	N	2	Y	Attempt 1 was discarded due to small sample size.	5	
TA_GRAB_24	N	2	Y	Attempt 1 was discarded due to small sample size.	8	
TA_GRAB_29	N	2	Y	Attempt 1 did not trigger, needed re-setting.	5	
TA_GRAB_40	N	4	Y	Attempts 1-3 were discarded due to small sample size.	8	
TA_GRAB_46	N	2	Y	Attempt 1 was too far from the target site.	6	
TA_GRAB_65	N	3	Y	Attempt 1 was discarded due to small sample size, attempt 2 was discarded due to stones in the jaws of the grab.	7	
TA_GRAB_67	N	7	N	Attempts 1-7 were discarded due to stones in the jaws of the grab.	-	
TA_GRAB_69	N	23	N	Attempts 1-3, 5-6, 10-11 and 13-20 were discarded due to small sample size. Attempts 4, 7-9, 12 and 21-23 were discarded due to stones in the jaws of the grab.	-	
TA_GRAB_70	N	2	Y	Attempt 1 was discarded due to small sample size.	7	
TA_GRAB_71	N	3	N	Attempts 1-3 were discarded due to small sample size.	-	
TA_GRAB_82	N	14	N	Attempts 1-2, 4-6, 9-10, 12 and 13 were discarded due to stones in the jaws of the grab. Attempt 3, 7 and 14 was discarded due to small sample size. Attempt 8 did not trigger and attempt 11 contained no sample.	-	
TA_GRAB_86	N	3	N	Attempts 1-3 were discarded due to stones in the jaws of the grab.	-	
TA_GRAB_90	N	3	Y		5	
TA_GRAB_91	N	6	Y	Attempts 1-5 were discarded due to small sample size.	7	
TA_GRAB_102	N	2	Y	Attempt 1 was discarded due to small sample size.	10	

APPENDIX I CHEMIAL GRAB LOG AND INVENTORY

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Site No.	Date	Time (GMT)	Depth (m BSL)	UTM WGS84 Z31 N		WGS84 (DD)		Metals	Hydrocarbons	TOC	Comments
				Eastings	Northings	Latitude	Longitude				
CABA_CHEM_06	26/08/2011	04:08	48.5	377235.4	6064027.7	54.708561°N	1.094529°E	Y	Y	Y	5Y 4/2, Dark brown/olive, fine - medium Sand with some shell fragments. Some anoxic sediment.
CABA_CHEM_07	26/08/2011	06:00	55.9	366712.3	6058599.5	54.657135°N	0.933787°E	Y	Y	Y	2.5Y 4/4, Dark brown medium Sand with some shell fragments. No anoxia.
CABA_CHEM_09	22/08/2011	10:48	61.8	353865.3	6043826.3	54.520912°N	0.742152°E	Y	Y	Y	5Y 4/3 Dark Brown/Olive, fine to medium sand with small shell fragments. Small amounts anoxic.
CABA_CHEM_12	29/06/2011	03:12	68.2	343467.2	6026947.3	54.366246°N	0.590568°E	Y	Y	Y	2.5Y 5/3 Light Olive Brown, fine brown sand with few shell fragments, fairly dense, easily compacted, no anoxia.
CABA_CHEM_15	29/06/2011	01:34	63.4	334253.9	6013798.0	54.245272°N	0.456197°E	Y	Y	Y	2.5Y 3/3 Dark Olive Brown, Fine brown sand with few shell fragments, fairly dense, easily compacted, no anoxia.
CABA_CHEM_23	29/06/2011	00:03	58.2	319174.9	6004724.4	54.158715°N	0.230515°E	Y	Y	Y	10YR 3/3 Dark Brown, Slightly silty, sandy, gravel with shell fragments. Compact with no anoxia.
TA_CHEM_04	24/08/2011	00:18	25.3	447470.8	6085160.3	54.910688°N	2.180637°E	Y	Y	Y	5Y 4/3 Dark brown/olive, fine to medium sand with some small shell fragments, no anoxia.
TA_CHEM_05	24/08/2011	01:24	23.3	445170.8	6079685.3	54.861245°N	2.145807°E	Y	Y	Y	5Y 4/4 Dark Brown/olive, fine to medium sand with some small shell fragments, no anoxia.
TA_CHEM_08	23/08/2011	23:24	27.8	453320.4	6087021.5	54.927993°N	2.271570°E	Y	Y	Y	5Y 4/3 Dark Brown/olive, fine to medium sand with small shell fragments.
TA_CHEM_17	25/08/2011	16:56	25.2	423462.4	6086242.6	54.917311°N	1.805937°E	Y	Y	Y	2.5Y 4/3 Olive brown, fine - medium Sand. No odour.
TA_CHEM_23	24/08/2011	05:21	32.7	439663.7	6067154.4	54.748015°N	2.062633°E	Y	Y	Y	5Y 4/3 Dark Brown/olive, fine to medium sand with some small shell fragments and a small amount of silt.
TA_CHEM_40REV2	25/08/2011	18:38	30.6	420864.2	6074151.1	54.808269°N	1.768728°E	N	N	Y	2.5Y 4/3 olive brown, fine - medium Sand, with shell fragments, gravel and .pebbles. No odour.
TA_CHEM_40REV2	25/08/2011	19:15	29.7	420853.7	6074145.3	54.808216°N	1.768566°E	Y	Y	N	2.5Y 4/3 olive brown, fine - medium Sand, with shell fragments, gravel and .pebbles. No odour.
TA_CHEM_41	24/08/2011	08:00	27.1	423975.4	6067830.7	54.751962°N	1.818779°E	Y	Y	Y	5Y 4/4 Dark Brown/olive, fine to medium sand with some small shell fragments, some anoxic sediment.
TA_CHEM_45	25/08/2011	04:29	27.2	396098.8	6092520.3	54.968761°N	1.376932°E	Y	Y	Y	2.5Y 5/4 Light Brown, medium sand, no anoxia.
TA_CHEM_49	24/08/2011	23:28	29.7	427449.2	6102363.3	55.062745°N	1.864037°E	Y	Y	Y	2.5Y 3/1 Dark Brown/olive fine to medium sand, no anoxia.
TA_CHEM_58	25/08/2011	10:46	28.6	425355.8	6094198.1	54.989074°N	1.833400°E	Y	Y	Y	2.5Y 4/3 Dark Brown, fine sand with silt/clay component and some anoxic sediment.
TA_CHEM_61	25/08/2011	11:49	25.2	431821.3	6092136.0	54.971474°N	1.934918°E	Y	Y	Y	2.5Y 4/4 Yellow/brown, fine to medium sand, no anoxia.
TA_CHEM_74	25/08/2011	07:40	24.6	407734.5	6084151.6	54.895869°N	1.561315°E	Y	Y	Y	2.5Y 5/3 Light Brown, medium sand, no shell fragments, no anoxia.
TA_CHEM_82 REV.	25/08/2011	17:47	30.9	417417.1	6080294.2	54.862906°N	1.713354°E	Y	Y	Y	2.5Y 4/4, Olive brown fine- medium Sand. No odour.
TA_CHEM_85	23/08/2011	22:37	27.0	457311.6	6083839.9	54.899761°N	2.334320°E	Y	Y	Y	5Y 3/2 Dark Brown/olive, fine to medium sand with some shell fragments and silt.
TA_CHEM_94	25/08/2011	02:09	27.8	411260.5	6097951.3	55.020481°N	1.612009°E	Y	Y	Y	2.5Y 5/3 Dark Brown/olive, fine to medium sand with few shell fragments, no anoxia.

APPENDIX I CHEMICAL GRAB SAMPLE QUALITY

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Site No.	Replicate?	Attempts	Successful sample collected (Y/N)	Brief description of problems with sample
CABA_CHEM_23	N	2	Y	Attempt 1 discarded due to small sample size.
TA_CHEM_5	N	3	Y	Attempts 1 and 2 discarded due to small sample size.
TA_CHEM_23	N	5	Y	Attempts 1-4 had stones in the jaw of the grab.
TA_CHEM_105	N	7	N	Attempts 1-7 had stones in the jaw of the grab. Site abandoned for a new location TA_CHEM_41.
TA_CHEM_41	N	2	Y	Attempt 1 mis-triggered, probably in the water column.
TA_CHEM_40	N	3	N	Attempts 1-3 had stones in the jaw of the grab. Target location moved to TA_CHEM_40_Revised.
TA_CHEM_40_Revised	N	3	N	Attempts 1 and 2 did not trigger, attempt 3 had stones in the jaw of the grab.
TA_CHEM_82	N	3	N	All attempts had stones in the jaw of the grab.
TA_CHEM_58	N	2	Y	Attempt 1 was discarded due to small sample size.
TA_CHEM_17	N	2	Y	Attempt 1 was discarded as the grab did not form a complete seal.
TA_CHEM_40REV2	N	3	Y	Attempt 2 was discarded due to stones in the jaw of the grab. Samples were collected from attempts 1 and 3.
CABA_CHEM_06	N	2	Y	Attempt 1 was discarded.
CABA_CHEM_07	N	2	Y	Attempt 1 was discarded.

APPENDIX I GRAB LOG AND INVENTORY (NEARSHORE SURVEY)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

Site No.	Date	Time (GMT)	Depth (m BSL)	UTM WGS84 Z31 N		Fauna (volume L)	PSA	Photo of sample	*In-situ* sediment description	Conspicuous Fauna
				Eastings	Northings					
NS01	16/01/2012	09:19	55.3	318494.0	6002636.0	9	Yes	Yes	Coarse sand, shell fragments	*Echinocardium cordatum*
NS02	16/01/2012	09:39	58.1	318418.0	6000523.0	6	Yes	Yes	Coarse sand, gravel and shell fragements with a clay component	Hermit crab, *Lanice conchiliga* and indet. bivalve molluscs
NS03	16/01/2012	09:01	58.9	317727.0	6003284.0	7	Yes	Yes	Coarse sand, gravel, shell fragments	Bivalve shells
NS06	15/01/2012	15:23	53.9	316057.0	6003271.0	7	Yes	Yes	Coarse sand, gravel, shell fragments	Crab (possible *Ebalia* sp.), indet. hermit crab, polychaete worms (*Pomatoceros* sp.) and bivalve shells
NS07	15/01/2012	15:07	53.4	315638.0	6002201.0	6.5	Yes	Yes	Coarse sand, gravel, shell fragments	Polychaete worms (Pomatoceros sp. and unidentified spp.) and bivalve shells
NS09	16/01/2012	10:30	54.0	314840.0	5998119.0	4.5	Yes	Yes	Two large cobbles, coarse sand, pebbles and shell fragments	Squat lobster (possibly *Munida rugosa*), brittlestars, polychaete worms (*Lanice conchiliga* , *Pomatoceros* sp., unidentified spp.), anemones
NS10	16/01/2012	10:50	56.5	314067.0	5999573.0	5	Yes	Yes	Coarse sand with pebbles and shell fragments	Possible sipunculids and polychaete worms (*Pomatoceros* sp.)
NS11	16/01/2012	11:22	56.4	313838.0	5999924.0	7.5	Yes	Yes	Coarse sand, pebbles and shell fragments with a clay component	Sand mason (*Lanice conchiliga*), tube worms (*Pomatoceros* sp,) and polychaete spp.
NS12	16/01/2012	11:37	55.6	313117.0	6000634.0	4.5	Yes	Yes	Coarse sand, pebbles and shell fragments with a clay component	
NS13	16/01/2012	15:29	54.0	312224.0	6002654.0	3	Yes	Yes	Coarse sand with fines, shell fragments, pebbles and a single cobble	Polychaete worms (*Pomatoceros* sp.)
NS14	16/01/2012	12:33	53.1	311588.0	5998994.0	4.5	Yes	Yes		Tube worms (Pomatoceros sp.), bivalve shells and polychaete spp.
NS15	16/01/2012	13:56	49.3	309898.0	5994588.0	9.5	Yes	Yes	Coarse sand, gravel, fines, shell fragments	Polychaete worms (*Pomatoceros* sp.)
NS16	16/01/2012	13:22	49.8	309408.0	5998140.0	6.5	Yes	Yes	Coarse sand, pebbles and shell fragments with a clay component	Polychaete worms (*Lanice conchiliga* , *Pomatoceros* sp., unidentified spp.) and crab (possible *Ebalia* sp.)
NS17	15/01/2012	11:41	52.4	308942.0	6000481.0	8	Yes	Yes	Coarse sand with shell fragements	Tube worms (*Pomatoceros* sp.), crab (possibly *Ebalia* sp.) and bivalve shells
NS18	22/11/2011	15:23	49.1	306963.0	5997028.0	7	Yes	Yes	Shell fragments and some gravel	Ophiuroidae
NS19	15/01/2012	10:39	49.5	306279.0	5998122.0	6	Yes	Yes	Gravel and shell fragments	Polychaete worms (*Pomatoceros* sp. and unidentified spp.), bivalve shells
NS20	22/11/2011	14:08	41.9	305742.0	5994664.0	9.5	Yes	Yes	Sandy gravel with some pebbles	Bryzoa, *Liocarcinus depurator* , *Crassoster papposus* , possible sipunculid
NS21	22/11/2011	14:36	41.8	305541.0	5995319.0	9.5	Yes	Yes	Dark brown sandy gravel with pebbles. Slight anoxic smell	Bryzoans and brittle stars.
NS22	22/11/2011	13:41	34.1	303930.0	5993630.0	9.5	Yes	Yes	Gravelly sand with cobbles	Bryzoa, worm casts attached to some pebbles
NS23	22/11/2011	13:19	34.6	303880.0	5993914.0	9	Yes	Yes	Fine sand with some gravel	Cowrie, *Liocarcinus depurator,* unidentified shrimp
NS24	22/11/2011	12:54	33.8	303834.0	5994354.0	9	Yes	Yes	Some gravel and shell fragments	Bryzoa, unidentified worm
NS25	22/11/2011	11:29	24.5	301786.0	5990380.0	9	Yes	Yes	Gravel	*Necora puber*
NS26	22/11/2011	12:27	29.2	301342.0	5996162.0	6	Yes	Yes	Gravelly sand with cobbles	*Cancer pagarus* , Ophiuroidea, Bryzoa, Hydrozoa
NS27	22/11/2011	11:55	28.0	301327.0	5993488.0	6	Yes	Yes	Gravelly sand	
NS28	22/11/2011	11:03	24.3	300789.0	5992360.0	9	Yes	Yes	Gravelly sand	
NS29	22/11/2011	08:32	17.6	298919.0	5993108.0	5	Yes	Yes		*Mytilus edulis* shells
NS30	22/11/2011	09:02	9.8	293037.0	5990814.0	5	Yes	Yes		Polychaete worm tubes
NS31	22/11/2011	09:25	10.7	291371.0	5989277.0	8.5	Yes	Yes	Slight anoxic smell	*Necora puber* and *Mytilus edulis*
NS32	22/11/2011	09:52	10.8	290567.0	5989112.0	5	Yes	Yes		
NS33	22/11/2011	10:26	8.3	290222.0	5990995.0	2	Yes	No		
NS34	21/11/2011	09:23	4.0	289715.0	5990500.0	5	Yes	Yes	Some gravel	Polychaete worms

APPENDIX I GRAB SAMPLE QUALITY (NEARSHORE SURVEY)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

Site No.	Replicate?	Attempts	Successful sample collected (Y/N)	Brief description of problems with sample	Size of sample retained (L)	Additional Notes on Quality of Retained Samples
NS06	N	2	Y	Attempt 1 had a cobble in jaw	7	
NS07	N	3	Y	Attempt 1 was low sample volume, attempt 2 had a cobble in jaw	6.5	
NS08	N	5	N	All attempts were very low sample volume (<1ltr)	-	
NS09	N	3	Y	Attempts 1-2 were low sample volume	4.5	
NS11	N	3	Y	Attempt 1 was low sample volume, attempt 2 the grab did not trigger	7.5	
NS12	N	4	Y	Attempts 2-4 were taken to try and get a larger sample than 4.5ltr but were all low sample volume	4.5	
NS13	N	8	Y	Attempts 1-3 had cobble in jaw, attempts 4-7 were low sample volume	3	
NS14	N	4	Y	Attempt 1 did not trigger, attempt 2 triggered in the water column, attempt 3 was low sample volume	4.5	
NS16	N	3	Y	Attempts 1-2 were low sample volume	6.5	
NS17	N	3	Y	Attempt 1 was low sample volume, attempt 2 had a cobble in jaw	8	
NS18	N	2	Y	Attempt 1 had a cobble in jaw	7	
NS19	N	2	Y	Attempt 1 was low sample volume	6	
NS26	N	2	Y	Attempt 1 had a cobble in jaw	6	
NS32	N	5	Y	Attempts 1 and 2 were low sample volume, swell caused movement of the vessel when the grab hit the seafloor, attempts 3 and 4 were low sample volume	5	
NS33	N	5	N	Attempts 1-4 were empty	2	Offset from target. PSA sample only

APPENDIX I CHEMICAL GRAB LOG AND INVENTORY (NEARSHORE SURVEY)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

Site No.	Date	Time (GMT)	Depth (m BSL)	UTM WGS84 Z31 N		WGS84 (DD)		Metals	Hydrocarbons	TOC	Comments
				Eastings	Northings	Latitude	Longitude				
NS08	14/01/2012	09:29	52.9	315278.0	6002740.0	54.139514°N	0.172126°E	Y	Y	Y	EMU sample reference: C269410
NS21	01/12/2011	14:24	39.9	305538.0	5995360.0	54.069682°N	0.027979°E	Y	Y	Y	EMU sample reference: C269409
NS28	01/12/2011	13:58	23.9	300805.0	5992380.0	54.041128°N	0.042289°W	Y	Y	Y	EMU sample reference: C269408
NS32	01/12/2011	09:35	14.0	290575.0	5989117.0	54.007796°N	0.196021°W		Y		EMU sample reference: C269407
NS32	01/12/2011	11:57	13.6	290592.0	5989195.0	54.008502°N	0.195815°W	Y		Y	EMU sample reference: C269407
NS33	01/12/2011	09:01	10.7	290233.0	5990988.0	54.024447°N	0.202522°W			Y	EMU sample reference: C269406
NS33	01/12/2011	09:19	10.7	290240.0	5990998.0	54.024539°N	0.202422°W	Y	Y		EMU sample reference: C269406
NS34	01/12/2011	08:36	6.4	289738.0	5990512.0	54.019974°N	0.209736°W	Y	Y	Y	EMU sample reference: C269405

APPENDIX I CHEMICAL GRAB SAMPLE QUALITY (NEARSHORE SURVEY)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

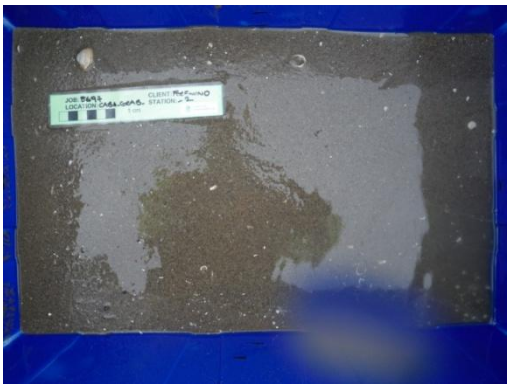
Site No.	Replicate?	Attempts	Successful sample collected (Y/N)	Brief description of problems with sample	Additional Notes on Quality of Retained Samples
NS08	N	4	Y	Attempts 1-2 triggered in the water column, attempt 3 was low sample volume	
NS28	N	2	Y	Attempt 1 was low sample volume	
NS32	N	17	Y	Attempts 2, 5 and 10 were low sample volume, attempt 3 triggered in the water column, attempts 4, 7, 9 and 11 had cobble in jaw, attempts 6, 8 and 12-13 did not trigger, attempts 14-16 were washed out	Hydrocabon was taken from attempt 1, TOC and metals were taken from attempt 17
NS33	N	6	Y	Attempts 1,2,4 and 5 were low sample volume	TOC was taken from attempt 3, metals and hydrocarbons were taken from attempt 6

APPENDIX II Photographs of grab samples

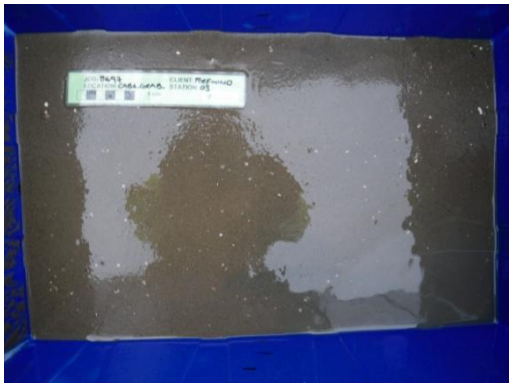
APPENDIX II PHOTOGRAPHS OF GRAB SAMPLES

Dogger Bank R3 Tranche A Benthic Survey J/1/03/1794

Appendix II Figure 1: Site CABA 01



Appendix II Figure 2: Site CABA 02

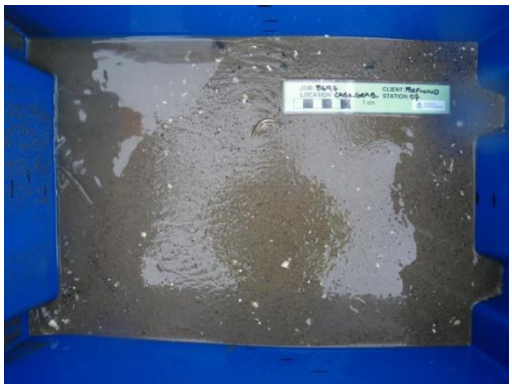


Appendix II Figure 3: Site CABA 03

Appendix II Figure 4: Site CABA 04

Appendix II Figure 5: Site CABA 05

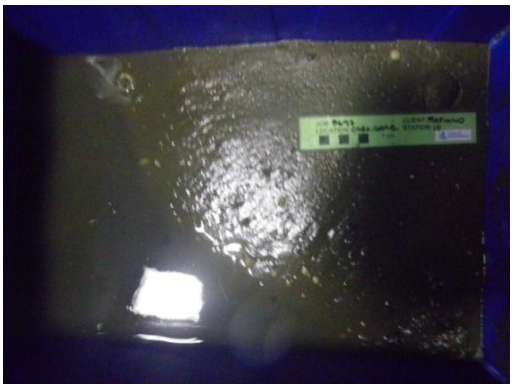
Appendix II Figure 6: Site CABA 06



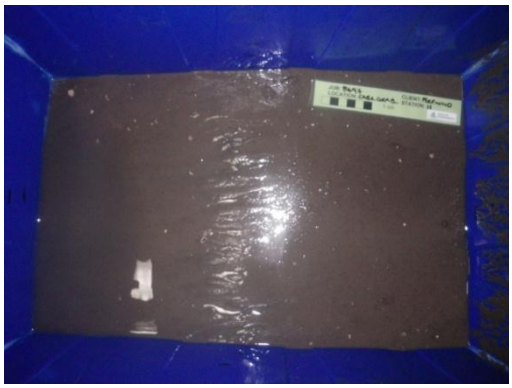
Appendix II Figure 7: Site CABA 07

Appendix II Figure 8: Site CABA 08

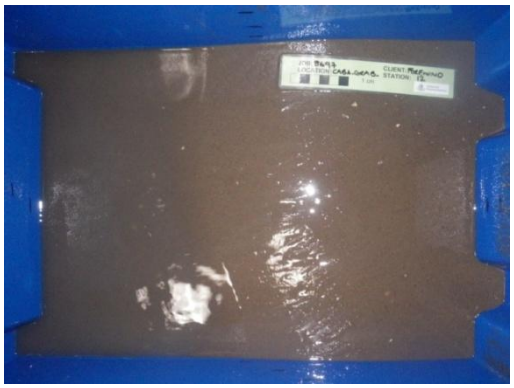
Appendix II Figure 9: Site CABA 09



Appendix II Figure 10: Site CABA 10



Appendix II Figure 11: Site CABA 11

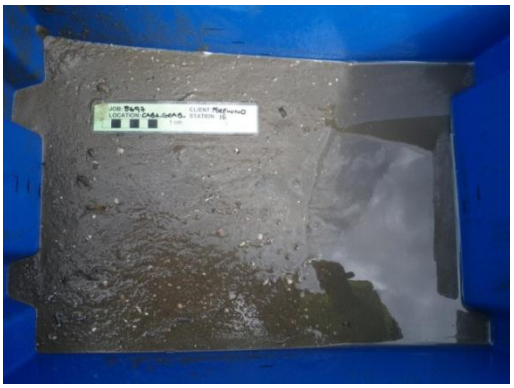


Appendix II Figure 12: Site CABA 12

Appendix II Figure 13: Site CABA 13

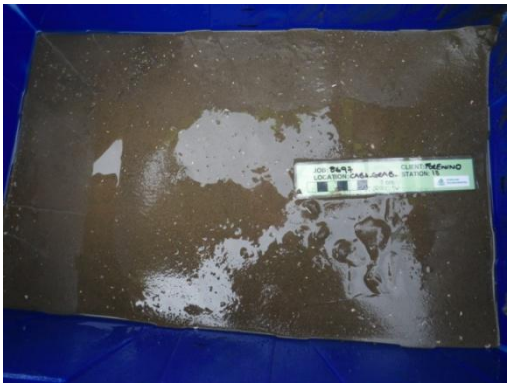
Appendix II Figure 14: Site CABA 14

Appendix II Figure 15: Site CABA 15

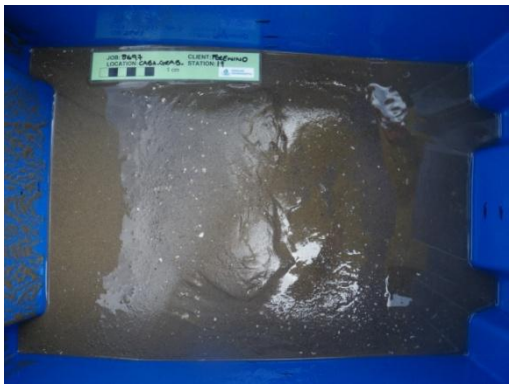


Appendix II Figure 16: Site CABA 16

Appendix II Figure 17: Site CABA 17



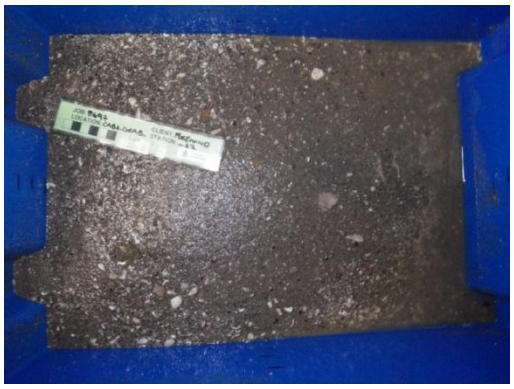
Appendix II Figure 18: Site CABA 18



Appendix II Figure 19: Site CABA 19

Appendix II Figure 20: Site CABA 20

Appendix II Figure 21: Site CABA 21



Appendix II Figure 22: Site CABA 22

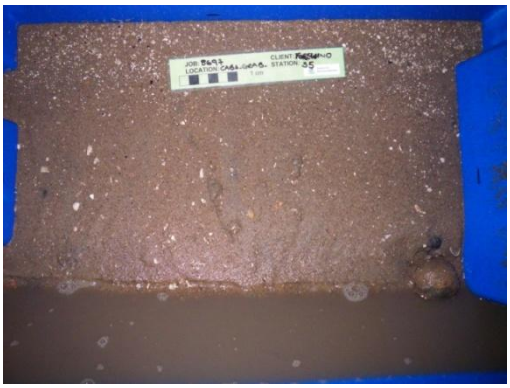
Appendix II Figure 23: Site CABA 23

Appendix II Figure 24: Site CABA 24

Appendix II Figure 25: Site CABA 26

Appendix II Figure 26: Site CABA 29

Appendix II Figure 27: Site CABA 32



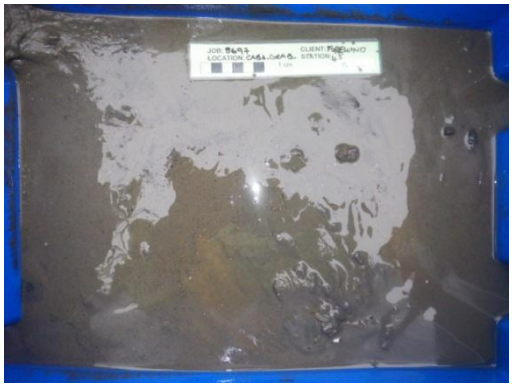
Appendix II Figure 28: Site CABA 35

Appendix II Figure 29: Site CABA 36

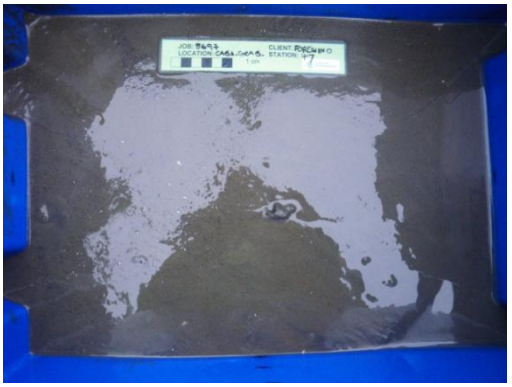
Appendix II Figure 30: Site CABA 39

Appendix II Figure 31: Site CABA 41

Appendix II Figure 32: Site CABA 42

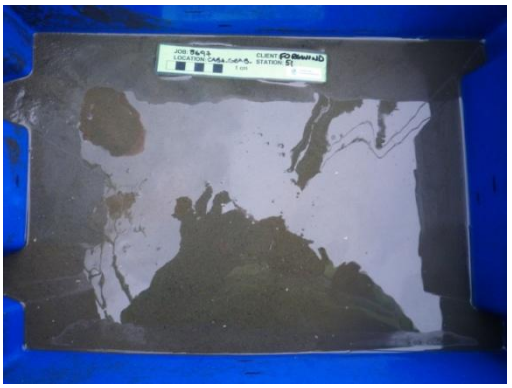


Appendix II Figure 33: Site CABA 45



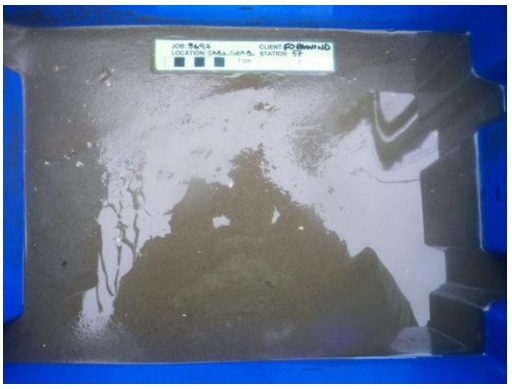
Appendix II Figure 34: Site CABA 47

Appendix II Figure 35: Site CABA 48



Appendix II Figure 36: Site CABA 51

Appendix II Figure 37: Site CABA 53 (mislabelled 57)



Appendix II Figure 38: Site CABA 57

Appendix II Figure 39: Site CABA 58

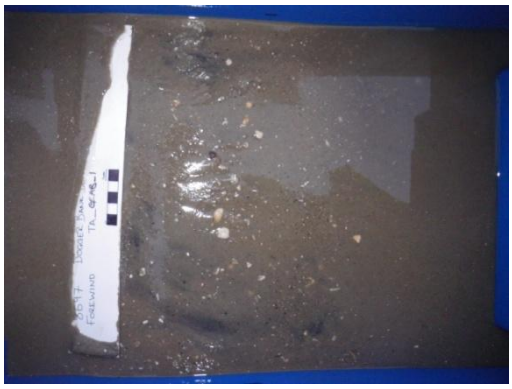
Appendix II Figure 40: Site CABA 61

Appendix II Figure 41: Site CABA 63

Appendix II Figure 42: Site CABA 65

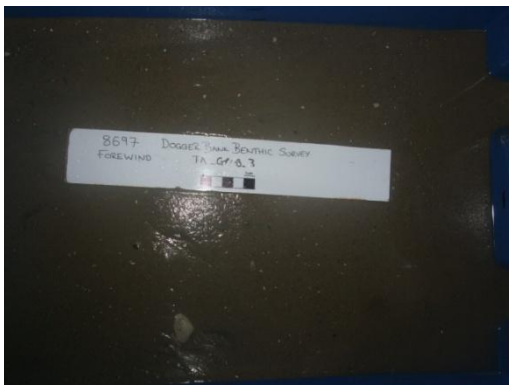
Appendix II Figure 43: Site CABA 67

Appendix II Figure 44: Site CABA 68



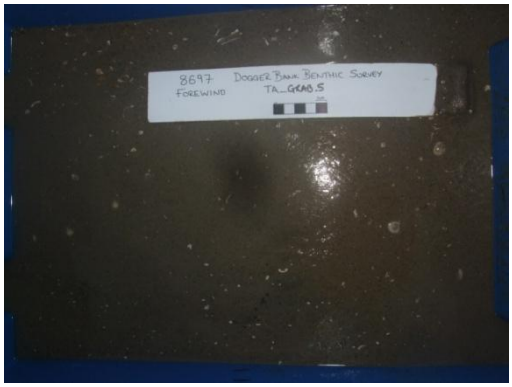
Appendix II Figure 45: Site TA 01

Appendix II Figure 46: Site TA 02

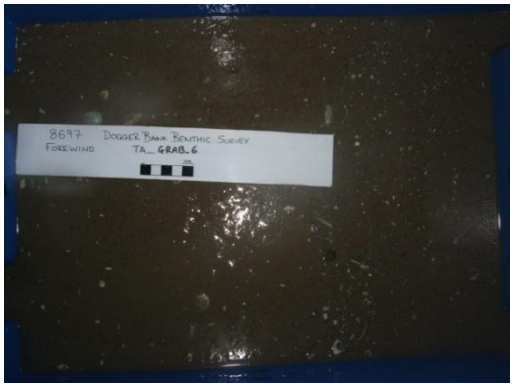


Appendix II Figure 47: Site TA 03

Appendix II Figure 48: Site TA 04



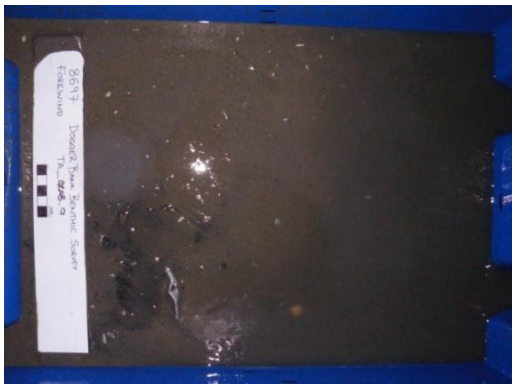
Appendix II Figure 49: Site TA 05



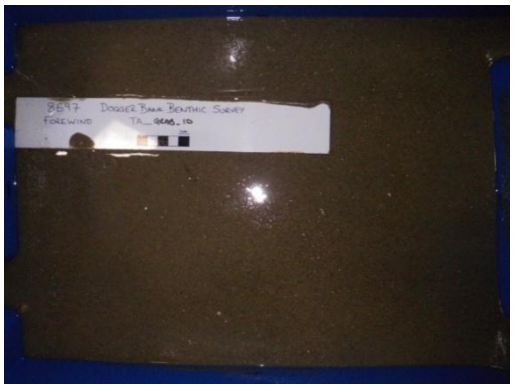
Appendix II Figure 50: Site TA 06

Appendix II Figure 51: Site TA 07

Appendix II Figure 52: Site TA 08

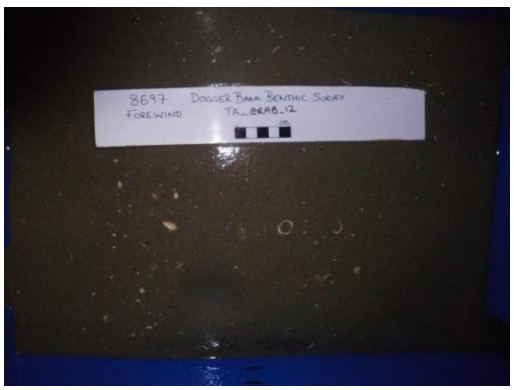


Appendix II Figure 53: Site TA 09

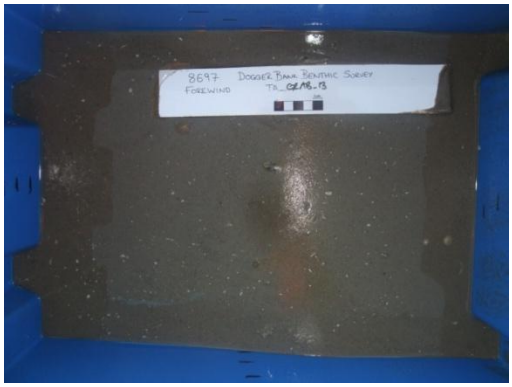


Appendix II Figure 54: Site TA 10

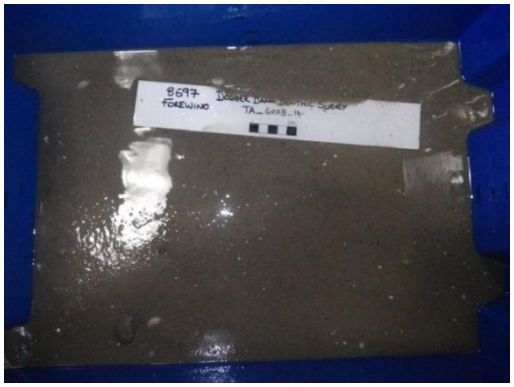
Appendix II Figure 55: Site TA 11



Appendix II Figure 56: Site TA 12

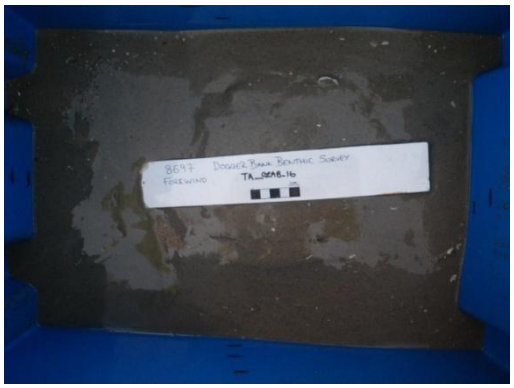


Appendix II Figure 57: Site TA 13



Appendix II Figure 58: Site TA 14

Appendix II Figure 59: Site TA 15

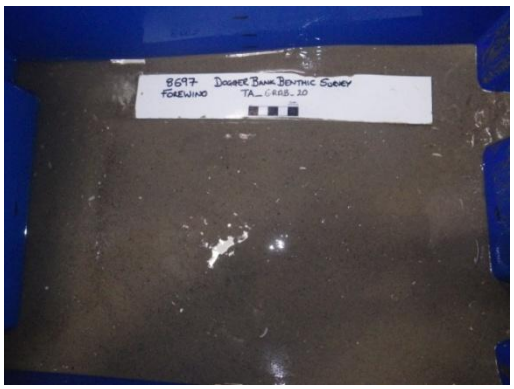


Appendix II Figure 60: Site TA 16

Appendix II Figure 61: Site TA 17

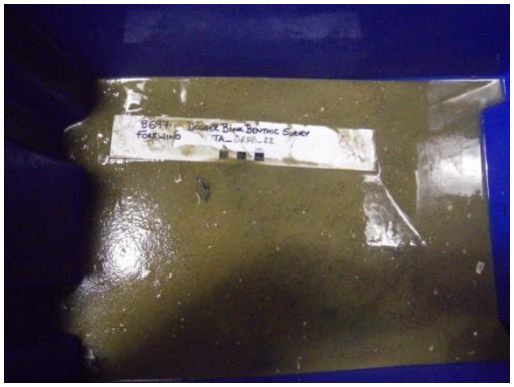
Appendix II Figure 62: Site TA 18

Appendix II Figure 63: Site TA 19



Appendix II Figure 64: Site TA 20

Appendix II Figure 65: Site TA 21



Appendix II Figure 66: Site TA 22

Appendix II Figure 67: Site TA 23

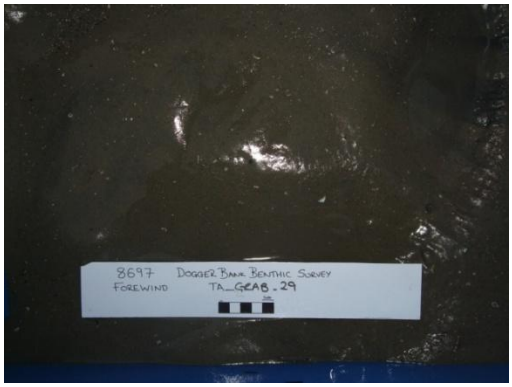
Appendix II Figure 68: Site TA 24 (mislabelled 25)

Appendix II Figure 69: Site TA 25

Appendix II Figure 70: Site TA 26

Appendix II Figure 71: Site TA 27

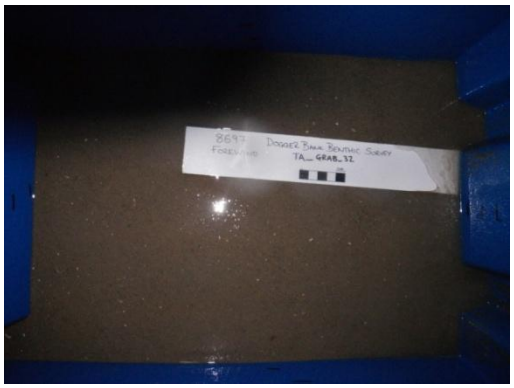
Appendix II Figure 72: Site TA 28



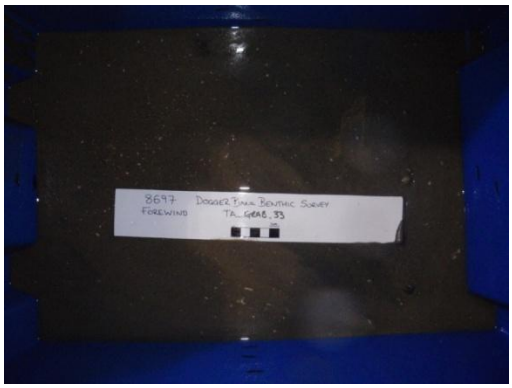
Appendix II Figure 73: Site TA 29

Appendix II Figure 74: Site TA 30

Appendix II Figure 75: Site TA 31

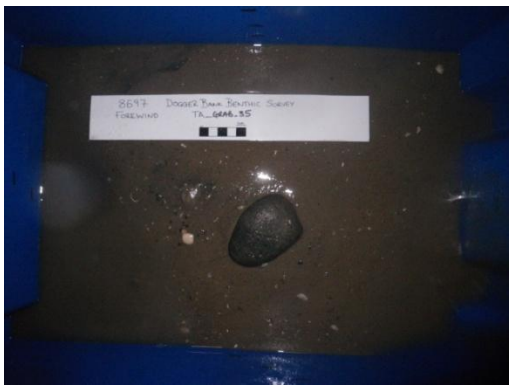


Appendix II Figure 76: Site TA 32

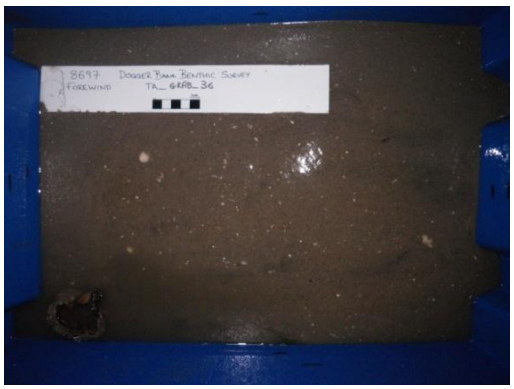


Appendix II Figure 77: Site TA 33

Appendix II Figure 78: Site TA 34



Appendix II Figure 79: Site TA 35



Appendix II Figure 80: Site TA 36

Appendix II Figure 81: Site TA 37

Appendix II Figure 82: Site TA 38

Appendix II Figure 83: Site TA 39

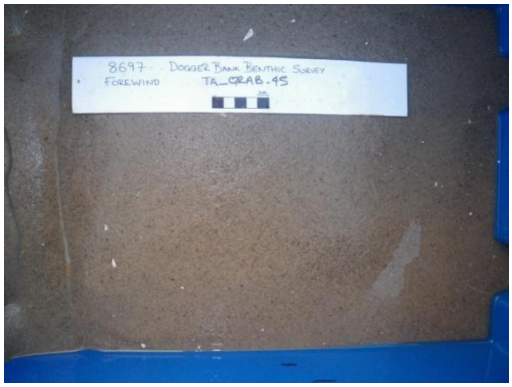
Appendix II Figure 84: Site TA 40

Appendix II Figure 85: Site TA 41

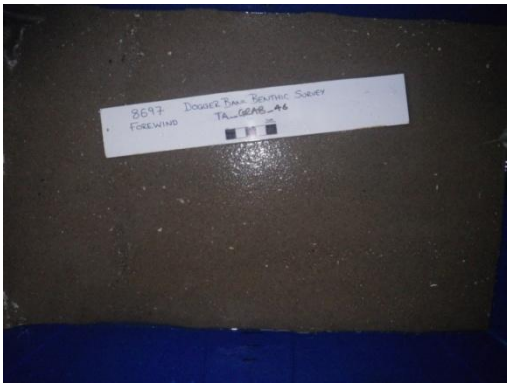
Appendix II Figure 86: Site TA 42

Appendix II Figure 87: Site TA 43

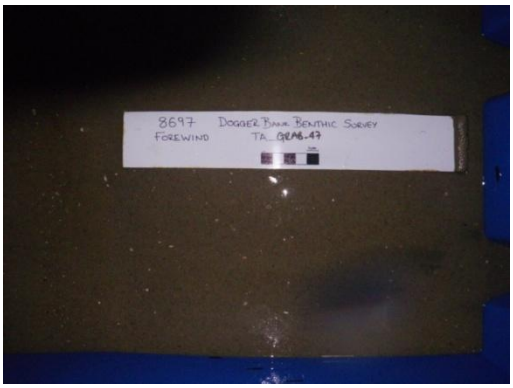
Appendix II Figure 88: Site TA 44



Appendix II Figure 89: Site TA 45



Appendix II Figure 90: Site TA 46

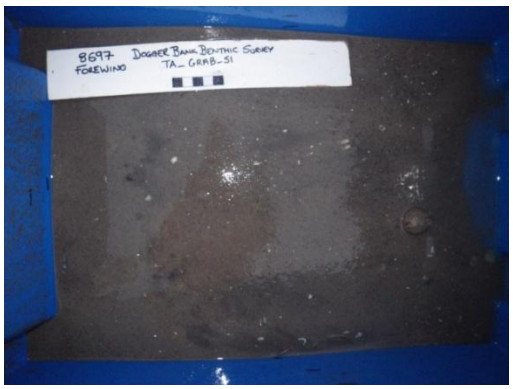


Appendix II Figure 91: Site TA 47

Appendix II Figure 92: Site TA 48

Appendix II Figure 93: Site TA 49

Appendix II Figure 94: Site TA 50



Appendix II Figure 95: Site TA 51

Appendix II Figure 96: Site TA 52

Appendix II Figure 97: Site TA 53

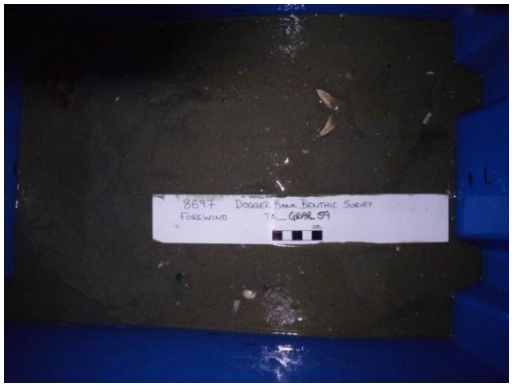
Appendix II Figure 98: Site TA 54

Appendix II Figure 99: Site TA 55

Appendix II Figure 100: Site TA 56

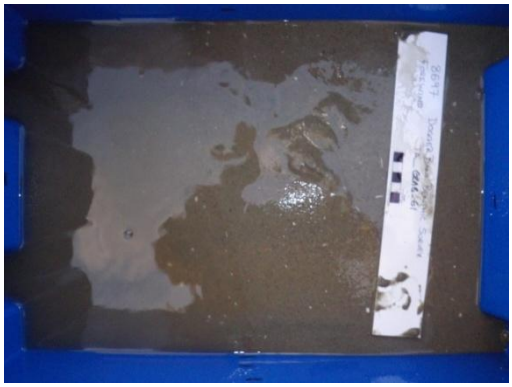
Appendix II Figure 101: Site TA 57

Appendix II Figure 102: Site TA 58

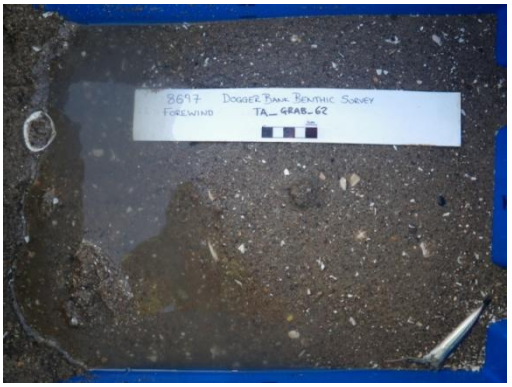


Appendix II Figure 103: Site TA 59

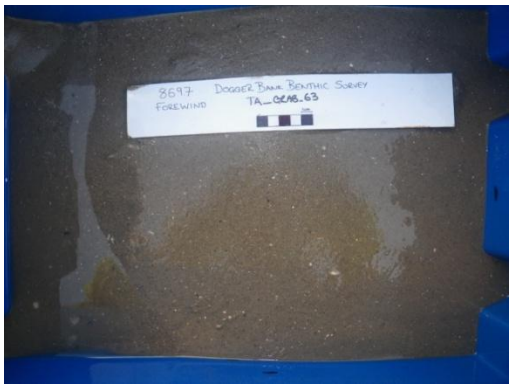
Appendix II Figure 104: Site TA 60



Appendix II Figure 105: Site TA 61



Appendix II Figure 106: Site TA 62



Appendix II Figure 107: Site TA 63

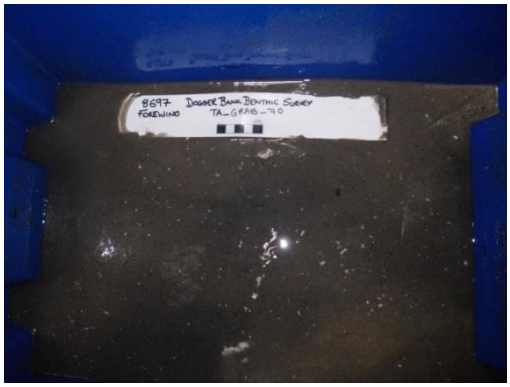
Appendix II Figure 108: Site TA 64

Appendix II Figure 109: Site TA 65 (mislabelled as 62)

Appendix II Figure 110: Site TA 66

Appendix II Figure 111: Site TA 68

Appendix II Figure 112: Site TA 69

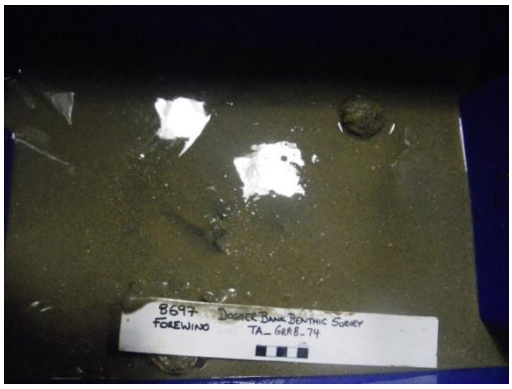


Appendix II Figure 113: Site TA 70

Appendix II Figure 114: Site TA 71

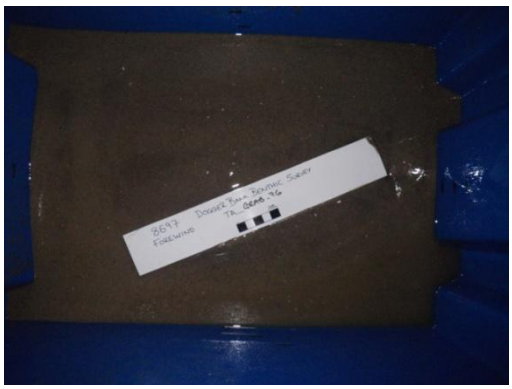
Appendix II Figure 115: Site TA 72

Appendix II Figure 116: Site TA 73

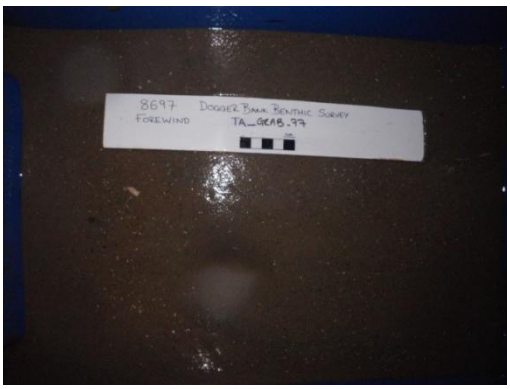


Appendix II Figure 117: Site TA 74

Appendix II Figure 118: Site TA 75



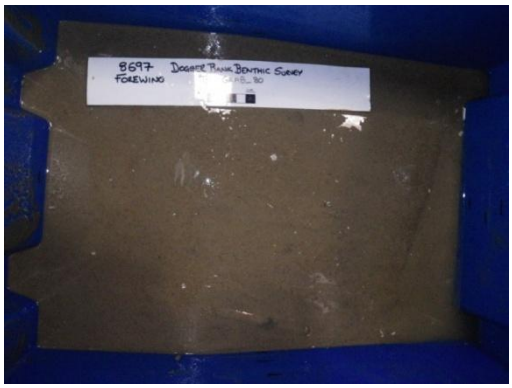
Appendix II Figure 119: Site TA 76



Appendix II Figure 120: Site TA 77

Appendix II Figure 121: Site TA 78

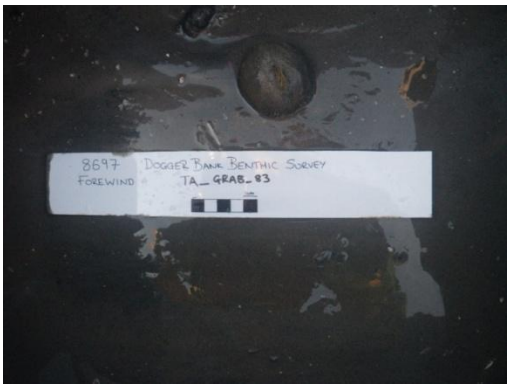
Appendix II Figure 122: Site TA 79



Appendix II Figure 123: Site TA 80

Appendix II Figure 124: Site TA 81

Appendix II Figure 125: Site TA 82



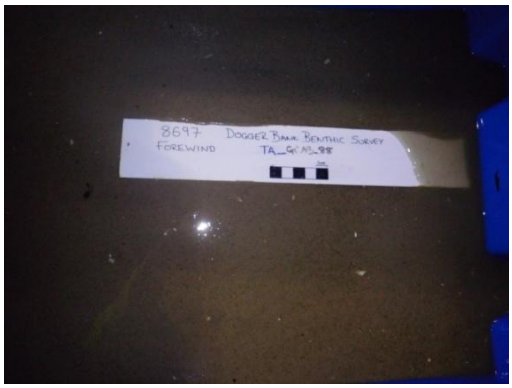
Appendix II Figure 126: Site TA 83

Appendix II Figure 127: Site TA 84

Appendix II Figure 128: Site TA 85

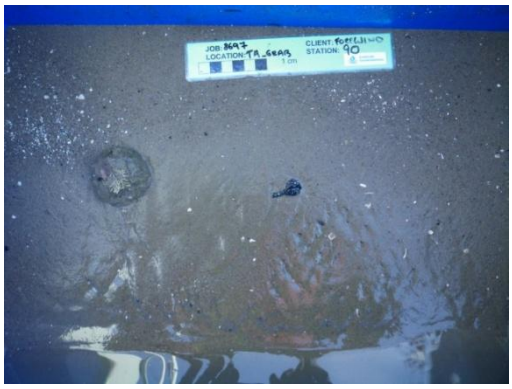
Appendix II Figure 129: Site TA 86

Appendix II Figure 130: Site TA 87



Appendix II Figure 131: Site TA 88

Appendix II Figure 132: Site TA 89



Appendix II Figure 133: Site TA 90

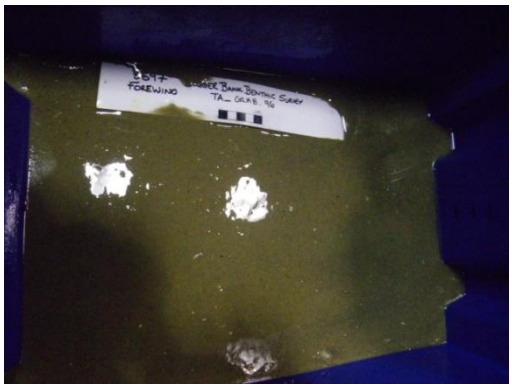
Appendix II Figure 134: Site TA 91

Appendix II Figure 135: Site TA 92

Appendix II Figure 136: Site TA 93

Appendix II Figure 137: Site TA 94

Appendix II Figure 138: Site TA 95

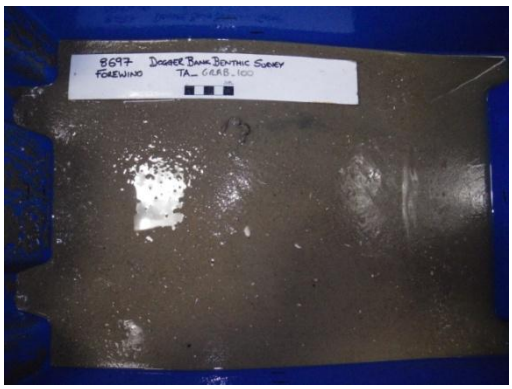


Appendix II Figure 139: Site TA 96

Appendix II Figure 140: Site TA 97

Appendix II Figure 141: Site TA 98

Appendix II Figure 142: Site TA 99



Appendix II Figure 143: Site TA 100

Appendix II Figure 144: Site TA 101

Appendix II Figure 145: Site TA 102

Appendix II Figure 146: Site TA 103

Appendix II Figure 147: Site TA 104

Appendix II Figure 148: Site TA 105

Appendix II Figure 149: Site TA 106

APPENDIX II PHOTOGRAPHS OF GRAB SAMPLES (NEARSHORE SITES)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

Figure 1: Site NS01 (mislabelled 02)

Figure 2: Site NS02 (mislabelled 01)

Figure 3: Site NS03

Figure 4: Site NS06

Figure 5: Site NS07

Figure 6: Site NS09

Figure 7: Site NS10

Figure 8: Site NS11

Figure 9: Site NS12 (mislabelled 13)

Figure 10: Site NS13

Figure 11: Site NS14

Figure 12: Site NS15

Figure 13: Site NS16

Figure 14: Site NS17

Figure 15: Site NS18

Figure 16: Site NS19

Figure 17: Site NS20

Figure 18: Site NS21

Figure 19: Site NS22

Figure 20: Site NS23

Figure 21: Site NS24

Figure 22: Site NS25

Figure 23: Site NS26

Figure 24: Site NS27

Figure 25: Site NS28

Figure 26: Site NS29

Figure 27: Site NS30

Figure 28: Site NS31

Figure 29: Site NS32

Figure 30: Site NS34

APPENDIX III Video logs

APPENDIX III HYPERDIGITAL VIDEO LOG

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Site	Date	Start Time (GMT)	Actual Start Depth (m BSL)	WGS84 UTM Z31N				WGS84 (DD)			
				Start Position		End Position		Start Position		End Position	
				Eastings	Northings	Eastings	Northings	Latitude	Longitude	Latitude	Longitude
CABA_CAM_01	25/06/2011	07:20	43.03	385656.9	6067939.0	385637.6	6067979.7	54.745678°N	1.223632°E	54.746039°N	1.223318°E
CABA_CAM_02	25/06/2011	06:14	41.86	384963.3	6067754.8	384954.8	6067762.0	54.743866°N	1.212936°E	54.743928°N	1.212802°E
CABA_CAM_03	25/06/2011	03:53	41.87	384340.2	6068327.4	384331.4	6068306.7	54.748866°N	1.203034°E	54.748678°N	1.202906°E
CABA_CAM_04	23/06/2011	18:45	41.65	383672.4	6067385.7	383665.4	6067378.1	54.740253°N	1.193041°E	54.740183°N	1.192935°E
CABA_CAM_05	23/06/2011	13:51	46.68	380296.4	6066186.8	380304.4	6066199.5	54.728692°N	1.141125°E	54.728808°N	1.141243°E
CABA_CAM_06	23/06/2011	10:35	49.35	377254.1	6064028.5	377246.8	6064022.8	54.708573°N	1.094818°E	54.708520°N	1.094707°E
CABA_CAM_07	23/06/2011	08:35	57.53	366721.9	6058606.0	366658.8	6058571.2	54.657195°N	0.933933°E	54.656866°N	0.932972°E
CABA_CAM_08	23/06/2011	06:40	66.58	363114.5	6055402.7	363128.1	6055394.9	54.627461°N	0.879552°E	54.627395°N	0.879767°E
CABA_CAM_09	23/06/2011	04:10	61.05	353871.8	6043818.1	353866.2	6043824.9	54.520839°N	0.742257°E	54.520899°N	0.742167°E
CABA_CAM_10	23/06/2011	02:00	60.07	348226.7	6035179.4	348244.0	6035213.4	54.441608°N	0.659553°E	54.441919°N	0.659801°E
CABA_CAM_11	23/06/2011	00:03	67.67	343810.4	6029290.9	343789.2	6029268.0	54.387395°N	0.594615°E	54.387183°N	0.594300°E
CABA_CAM_12	22/06/2011	22:42	67.38	343472.0	6026929.6	343469.2	6026943.7	54.366088°N	0.590651°E	54.366214°N	0.590600°E
CABA_CAM_13	22/06/2011	20:23	63.41	339689.8	6019891.6	339704.0	6019887.6	54.301718°N	0.536276°E	54.301686°N	0.536497°E
CABA_CAM_14	22/06/2011	19:11	63.39	338729.1	6017559.1	338794.1	6017506.4	54.280472°N	0.522784°E	54.280019°N	0.523810°E
CABA_CAM_15	22/06/2011	15:50	60.41	334238.1	6013782.3	334229.3	6013763.3	54.245125°N	0.455965°E	54.244952°N	0.455839°E
CABA_CAM_16	22/06/2011	13:27	56.53	331933.8	6013064.2	331920.0	6013058.1	54.237927°N	0.421040°E	54.237867°N	0.420833°E
CABA_CAM_16A	22/06/2011	17:39	53.60	331986.2	6013089.3	332001.7	6013085.8	54.238170°N	0.421830°E	54.238143°N	0.422069°E
CABA_CAM_17	22/06/2011	12:08	61.37	331109.7	6012190.3	331126.2	6012180.3	54.229810°N	0.408901°E	54.229726°N	0.409160°E
CABA_CAM_18	22/06/2011	10:38	59.36	327833.3	6010047.7	327831.1	6010050.1	54.209483°N	0.359921°E	54.209504°N	0.359886°E
CABA_CAM_19	22/06/2011	08:16	57.85	327572.8	6006957.9	327560.4	6006955.8	54.181655°N	0.357704°E	54.181632°N	0.357514°E
CABA_CAM_20	22/06/2011	09:36	59.34	325524.7	6008452.4	325517.5	6008449.4	54.194380°N	0.325489°E	54.194350°N	0.325380°E
CABA_CAM_21	22/06/2011	04:05	54.90	326978.5	6005811.8	326982.4	6005821.4	54.171165°N	0.349266°E	54.171252°N	0.349319°E
CABA_CAM_22	22/06/2011	01:23	56.55	323300.2	6006468.7	323295.4	6006466.4	54.175810°N	0.292596°E	54.175787°N	0.292523°E
CABA_CAM_23	22/06/2011	23:56	58.00	319167.4	6004733.2	319178.5	6004730.2	54.158791°N	0.230396°E	54.158767°N	0.230567°E
CABA_CAM_24	26/06/2011	00:52	26.47	408020.4	6076047.4	408022.3	6076047.4	54.823114°N	1.568353°E	54.823114°N	1.568382°E
CABA_CAM_25	26/06/2011	02:09	24.15	409241.6	6066810.5	409240.8	6066805.3	54.740352°N	1.590243°E	54.740306°N	1.590233°E
CABA_CAM_26	26/06/2011	03:05	28.94	405347.7	6068151.6	405351.4	6068147.5	54.751683°N	1.529344°E	54.751646°N	1.529403°E
CABA_CAM_27	25/06/2011	23:39	29.10	402827.5	6073674.1	402833.2	6073675.1	54.800813°N	1.488352°E	54.800824°N	1.488442°E
CABA_CAM_28	25/06/2011	21:49	28.67	398271.0	6076272.5	398269.5	6076269.5	54.823252°N	1.416587°E	54.823225°N	1.416565°E
CABA_CAM_29	25/06/2011	20:43	29.86	392500.0	6078234.2	392492.4	6078244.4	54.839670°N	1.326075°E	54.839759°N	1.325952°E
CABA_CAM_30	25/06/2011	22:46	23.27	399411.5	6072526.9	399404.2	6072530.7	54.789834°N	1.435632°E	54.789867°N	1.435518°E
CABA_CAM_31	26/06/2011	04:06	24.57	401907.1	6068592.0	401922.3	6068559.8	54.754979°N	1.475758°E	54.754693°N	1.476005°E
CABA_CAM_32	26/06/2011	07:06	26.75	394883.9	6073030.5	394880.6	6073036.4	54.793431°N	1.365068°E	54.793483°N	1.365013°E
CABA_CAM_33	26/06/2011	08:12	38.29	388963.3	6076044.7	388988.1	6076079.0	54.819230°N	1.271871°E	54.819544°N	1.272244°E
CABA_CAM_34	26/06/2011	05:12	26.26	397266.7	6067053.8	397278.1	6067050.8	54.740234°N	1.404226°E	54.740209°N	1.404404°E
CABA_CAM_35	26/06/2011	06:07	34.24	393177.1	6066916.1	393159.3	6066978.3	54.738144°N	1.340781°E	54.738699°N	1.340482°E
CABA_CAM_36	26/06/2011	09:25	45.08	385282.2	6073081.9	385261.1	6073074.1	54.791789°N	1.215783°E	54.791714°N	1.215458°E
CABA_CAM_37	26/06/2011	10:44	43.83	388512.5	6066311.6	388514.4	6066311.7	54.731701°N	1.268597°E	54.731703°N	1.268627°E
CABA_CAM_38	26/06/2011	14:46	45.69	381390.9	6070531.1	381372.2	6070528.0	54.767972°N	1.156338°E	54.767941°N	1.156048°E
CABA_CAM_39	26/06/2011	12:52	47.14	385200.1	6064075.1	385202.0	6064092.3	54.710867°N	1.218064°E	54.711021°N	1.218087°E
CABA_CAM_40	26/06/2011	17:21	47.15	380314.6	6062552.4	380327.9	6062575.8	54.696052°N	1.142899°E	54.696265°N	1.143096°E
CABA_CAM_41	26/06/2011	16:05	51.67	375284.2	6066531.0	375288.5	6066521.1	54.730566°N	1.063190°E	54.730478°N	1.063261°E
CABA_CAM_42	26/06/2011	18:23	48.77	376043.0	6060095.9	376048.9	6060103.3	54.672955°N	1.077703°E	54.673022°N	1.077792°E

Site	Date	Start Time (GMT)	Actual Start Depth (m BSL)	WGS84 UTM Z31N				WGS84 (DD)			
				Start Position		End Position		Start Position		End Position	
				Eastings	Northings	Eastings	Northings	Latitude	Longitude	Latitude	Longitude
CABA_CAM_43	26/06/2011	19:27	49.56	372662.1	6056857.1	372651.9	6056859.0	54.643022°N	1.026717°E	54.643036°N	1.026559°E
CABA_CAM_44	26/06/2011	20:41	65.19	368114.1	6063333.3	368124.9	6063325.0	54.700018°N	0.953365°E	54.699946°N	0.953537°E
CABA_CAM_45	26/06/2011	21:48	68.53	363304.1	6059977.9	363302.0	6059980.7	54.668601°N	0.880349°E	54.668626°N	0.880315°E
CABA_CAM_46	27/06/2011	05:24	64.77	367147.4	6055324.4	367150.5	6055317.8	54.627835°N	0.942014°E	54.627777°N	0.942066°E
CABA_CAM_47	26/06/2011	23:03	74.82	358950.2	6059524.3	358965.6	6059479.0	54.663328°N	0.813109°E	54.662926°N	0.813370°E
CABA_CAM_48	27/06/2011	06:35	64.26	362724.7	6052085.6	362695.5	6052073.5	54.597564°N	0.875072°E	54.597448°N	0.874626°E
CABA_CAM_49	27/06/2011	07:42	65.91	356928.3	6051530.4	356931.9	6051528.4	54.590971°N	0.785691°E	54.590954°N	0.785748°E
CABA_CAM_50	27/06/2011	08:43	66.66	352804.7	6049616.3	352808.7	6049613.0	54.572599°N	0.722885°E	54.572570°N	0.722948°E
CABA_CAM_51	27/06/2011	10:06	60.22	356866.5	6042564.9	356859.5	6042557.4	54.510440°N	0.789096°E	54.510370°N	0.788991°E
CABA_CAM_52	27/06/2011	11:21	60.29	353046.8	6039035.8	353075.1	6039063.7	54.477655°N	0.731901°E	54.477914°N	0.732324°E
CABA_CAM_53	27/06/2011	20:39	62.05	348626.2	6042440.4	348630.4	6042425.4	54.506929°N	0.661990°E	54.506795°N	0.662062°E
CABA_CAM_54	27/06/2011	22:29	63.87	346094.6	6036382.2	346087.1	6036381.0	54.451768°N	0.626080°E	54.451754°N	0.625965°E
CABA_CAM_55	28/06/2011	01:05	65.67	348985.8	6033118.8	349019.6	6033118.6	54.423331°N	0.672297°E	54.423339°N	0.672818°E
CABA_CAM_56	28/06/2011	02:34	71.02	341379.9	6033174.1	341374.2	6033181.0	54.421512°N	0.555147°E	54.421572°N	0.555056°E
CABA_CAM_57	28/06/2011	05:18	66.40	347863.9	6028355.3	347842.9	6028340.6	54.380220°N	0.657460°E	54.380083°N	0.657145°E
CABA_CAM_58	28/06/2011	03:38	69.19	340376.2	6027660.4	340391.0	6027662.8	54.371691°N	0.542655°E	54.371716°N	0.542882°E
CABA_CAM_59	28/06/2011	06:26	62.50	345720.6	6024069.1	345710.4	6024080.8	54.341087°N	0.626710°E	54.341190°N	0.626548°E
CABA_CAM_60	28/06/2011	07:26	61.31	343177.2	6020448.3	343193.0	6020446.0	54.307799°N	0.589526°E	54.307783°N	0.589771°E
CABA_CAM_61	28/06/2011	08:24	60.86	338453.3	6022158.5	338456.1	6022158.0	54.321683°N	0.516066°E	54.321679°N	0.516109°E
CABA_CAM_62	28/06/2011	09:23	62.93	335922.2	6019522.9	335931.4	6019516.5	54.297212°N	0.478637°E	54.297158°N	0.478782°E
CABA_CAM_63	28/06/2011	10:29	61.49	338690.3	6014400.5	338690.5	6014409.5	54.252099°N	0.523891°E	54.252179°N	0.523888°E
CABA_CAM_64	28/06/2011	11:42	64.17	333143.2	6016398.6	333125.6	6016396.4	54.268260°N	0.437722°E	54.268235°N	0.437454°E
CABA_CAM_65	28/06/2011	12:43	63.11	329783.0	6015663.5	329774.5	6015658.4	54.260554°N	0.386599°E	54.260505°N	0.386471°E
CABA_CAM_66	28/06/2011	21:21	59.49	333491.7	6008517.5	333492.9	6008510.1	54.197613°N	0.447440°E	54.197547°N	0.447462°E
CABA_CAM_67	28/06/2011	15:08	60.80	325211.8	6013873.4	325209.6	6013876.1	54.242942°N	0.317544°E	54.242965°N	0.317508°E
CABA_CAM_68	28/06/2011	20:06	56.06	330170.4	6003315.2	330186.6	6003326.8	54.149816°N	0.399516°E	54.149925°N	0.399758°E
CABA_CAM_69	28/06/2011	16:50	58.95	322158.5	6009274.5	322131.5	6009273.1	54.200605°N	0.273467°E	54.200582°N	0.273054°E
CABA_CAM_70	28/06/2011	18:39	55.62	323720.0	6000648.0	323715.6	6000643.7	54.123697°N	0.302421°E	54.123657°N	0.302357°E
CABA_CAM_71	29/06/2011	19:37	25.26	410501.5	6074910.6	410492.4	6074907.3	54.813350°N	1.607310°E	54.813319°N	1.607168°E
CABA_CAM_72	29/06/2011	17:19	29.19	403856.0	6070975.4	403848.7	6070990.1	54.776767°N	1.505241°E	54.776898°N	1.505124°E
CABA_CAM_73	29/06/2011	18:02	29.28	407023.2	6071116.8	407009.2	6071086.6	54.778634°N	1.554418°E	54.778361°N	1.554212°E
CABA_CAM_74	29/06/2011	18:54	26.12	407975.6	6073522.3	408000.4	6073515.1	54.800421°N	1.568458°E	54.800361°N	1.568845°E
CABA_CAM_75	29/06/2011	14:19	40.38	389468.6	6068958.1	389478.8	6068917.2	54.755686°N	1.282431°E	54.755320°N	1.282606°E
CABA_CAM_76	29/06/2011	16:11	26.80	397708.2	6069537.0	397691.0	6069541.9	54.762631°N	1.410207°E	54.762672°N	1.409939°E
CABA_CAM_77	29/06/2011	15:15	37.71	393112.9	6069835.0	393130.5	6069838.3	54.764351°N	1.338711°E	54.764385°N	1.338983°E
CABA_CAM_78	29/06/2011	21:11	25.73	398847.6	6079530.0	398818.7	6079527.0	54.852632°N	1.424419°E	54.852600°N	1.423970°E
CABA_CAM_79	29/06/2011	22:07	24.18	395908.1	6076851.9	395900.8	6076867.0	54.827972°N	1.379616°E	54.828106°N	1.379497°E
CABA_CAM_80	29/06/2011	22:43	28.73	394756.4	6076119.8	394718.4	6076112.4	54.821155°N	1.361962°E	54.821080°N	1.361374°E
CABA_CAM_81	30/06/2011	23:44	35.63	392076.7	6073792.3	392079.9	6073805.5	54.799678°N	1.321142°E	54.799797°N	1.321186°E
CABA_CAM_82	30/06/2011	00:56	37.94	388348.7	6071284.6	388378.6	6071267.1	54.776336°N	1.264144°E	54.776185°N	1.264614°E
TA_CAM_01	26/05/2011	19:24	24.34	451724.6	6081254.2	451722.5	6081257.2	54.876017°N	2.247637°E	54.876045°N	2.247603°E
TA_CAM_02	26/05/2011	20:27	24.70	449341.4	6079359.7	449361.2	6079366.2	54.858758°N	2.210831°E	54.858819°N	2.211138°E
TA_CAM_03	31/05/2011	20:44	24.08	449644.6	6075999.2	449636.6	6075989.4	54.828592°N	2.216140°E	54.828504°N	2.216017°E
TA_CAM_04	25/05/2011	21:57	25.49	447426.6	6085134.6	447467.0	6085141.4	54.910452°N	2.179952°E	54.910518°N	2.180581°E
TA_CAM_05	31/05/2011	19:37	23.08	445168.4	6079670.1	445173.4	6079661.5	54.861108°N	2.145772°E	54.861031°N	2.145851°E

Site	Date	Start Time (GMT)	Actual Start Depth (m BSL)	WGS84 UTM Z31N				WGS84 (DD)			
				Start Position		End Position		Start Position		End Position	
				Eastings	Northings	Eastings	Northings	Latitude	Longitude	Latitude	Longitude
TA_CAM_06	31/05/2011	22:01	21.39	445067.8	6072737.3	445061.2	6072701.6	54.798801°N	2.145522°E	54.798480°N	2.145426°E
TA_CAM_07	29/05/2011	20:28	26.86	447245.3	6090327.0	447251.9	6090312.1	54.957090°N	2.176172°E	54.956957°N	2.176277°E
TA_CAM_08	25/05/2011	20:40	27.98	453308.3	6087025.5	453303.2	6087025.5	54.928028°N	2.271381°E	54.928028°N	2.271301°E
TA_CAM_09	25/05/2011	19:55	26.46	454800.7	6085634.0	454805.0	6085642.1	54.915661°N	2.294885°E	54.915735°N	2.294952°E
TA_CAM_10	30/05/2011	22:53	26.64	437603.8	6097689.9	437568.6	6097702.8	55.022133°N	2.024027°E	55.022246°N	2.023473°E
TA_CAM_11	30/05/2011	00:46	27.34	440192.9	6093400.0	440179.1	6093398.2	54.983906°N	2.065414°E	54.983888°N	2.065199°E
TA_CAM_12	29/05/2011	22:42	25.39	442376.3	6088523.6	442381.3	6088519.9	54.940347°N	2.100508°E	54.940314°N	2.100588°E
TA_CAM_13	31/05/2011	18:35	24.76	443266.5	6083843.1	443258.1	6083851.9	54.898392°N	2.115326°E	54.898470°N	2.115192°E
TA_CAM_14	10/06/2011	01:42	23.53	431930.3	6087648.9	431921.4	6087639.9	54.931172°N	1.937685°E	54.931090°N	1.937548°E
TA_CAM_15	10/06/2011	21:27	26.19	425556.8	6078181.9	425559.3	6078176.6	54.845204°N	1.840686°E	54.845157°N	1.840726°E
TA_CAM_16	19/05/2011	19:10	25.60	437519.7	6074480.0	437518.2	6074478.5	54.813577°N	2.027752°E	54.813563°N	2.027730°E
TA_CAM_17	11/06/2011	01:25	25.03	423467.9	6086240.6	423467.7	6086240.9	54.917294°N	1.806024°E	54.917296°N	1.806020°E
TA_CAM_18	06/06/2011	03:07	24.80	436262.4	6086539.0	436310.6	6086556.3	54.921772°N	2.005527°E	54.921933°N	2.006274°E
TA_CAM_19	09/06/2011	21:45	24.45	438595.5	6083247.9	438549.5	6083290.5	54.892493°N	2.042626°E	54.892870°N	2.041899°E
TA_CAM_20	10/06/2011	00:37	24.05	432933.2	6084357.9	432928.4	6084336.8	54.901739°N	1.954100°E	54.901548°N	1.954030°E
TA_CAM_21	19/05/2011	17:50	24.57	436582.6	6080867.8	436598.6	6080864.7	54.870855°N	2.011770°E	54.870830°N	2.012020°E
TA_CAM_22	09/06/2011	22:55	24.95	435507.0	6083846.2	435531.4	6083827.7	54.897480°N	1.994347°E	54.897316°N	1.994730°E
TA_CAM_23	31/05/2011	23:23	33.02	439696.7	6067130.4	439704.9	6067134.9	54.747803°N	2.063151°E	54.747844°N	2.063277°E
TA_CAM_24	09/05/2011	01:15	30.09	436993.6	6064936.6	436986.0	6064936.2	54.727759°N	2.021638°E	54.727755°N	2.021519°E
TA_CAM_25	09/05/2011	02:31	27.93	435505.3	6062749.5	435477.0	6062782.1	54.707918°N	1.999015°E	54.708207°N	1.998569°E
TA_CAM_26	09/05/2011	03:59	28.04	433732.2	6061287.4	433719.5	6061250.5	54.694551°N	1.971834°E	54.694217°N	1.971645°E
TA_CAM_27	08/05/2011	22:46	30.73	430230.5	6066337.6	430231.8	6066331.5	54.739454°N	1.916305°E	54.739400°N	1.916326°E
TA_CAM_28	10/06/2011	20:26	30.67	427144.9	6074794.6	427149.0	6074793.5	54.815003°N	1.866264°E	54.814994°N	1.866329°E
TA_CAM_29	08/05/2011	23:55	30.46	434897.4	6066633.9	434909.8	6066684.1	54.742743°N	1.988714°E	54.743195°N	1.988895°E
TA_CAM_30	19/05/2011	21:20	33.65	432018.7	6069326.3	432019.3	6069312.0	54.766554°N	1.943375°E	54.766426°N	1.943388°E
TA_CAM_31	19/05/2011	22:09	33.44	429631.6	6071794.9	429622.4	6071799.1	54.788406°N	1.905682°E	54.788442°N	1.905538°E
TA_CAM_32	19/05/2011	23:11	26.08	425856.2	6071112.8	425827.2	6071118.0	54.781733°N	1.847157°E	54.781776°N	1.846705°E
TA_CAM_32_1	01/06/2011	02:31	27.12	425867.2	6071116.6	425856.8	6071105.5	54.781769°N	1.847326°E	54.781668°N	1.847168°E
TA_CAM_33	08/05/2011	22:07	29.08	427945.2	6065720.5	427957.4	6065716.8	54.733587°N	1.880968°E	54.733556°N	1.881158°E
TA_CAM_34	12/05/2011	21:47	26.78	430346.8	6060769.4	430341.2	6060771.3	54.689439°N	1.919442°E	54.689455°N	1.919355°E
TA_CAM_35	08/05/2011	20:50	27.16	425263.7	6064241.1	425248.1	6064233.8	54.719904°N	1.839713°E	54.719836°N	1.839473°E
TA_CAM_36	08/05/2011	00:07	22.71	419875.7	6065941.6	419884.1	6065946.3	54.734353°N	1.755617°E	54.734396°N	1.755747°E
TA_CAM_36_1	08/05/2011	18:54	23.57	419859.6	6065952.7	419890.1	6065931.6	54.734450°N	1.755364°E	54.734266°N	1.755843°E
TA_CAM_37	07/05/2011	21:57	23.75	414601.4	6068614.6	414610.8	6068599.9	54.757500°N	1.672942°E	54.757369°N	1.673092°E
TA_CAM_38	14/06/2011	20:22	25.55	413260.8	6076663.0	413270.0	6076655.5	54.829579°N	1.649708°E	54.829513°N	1.649853°E
TA_CAM_39	14/06/2011	19:27	24.03	416691.9	6075488.6	416690.2	6075494.4	54.819610°N	1.703444°E	54.819662°N	1.703416°E
TA_CAM_40	07/05/2011	19:04	29.34	420750.9	6073407.2	420761.7	6073403.4	54.801568°N	1.767168°E	54.801536°N	1.767337°E
TA_CAM_41	08/05/2011	19:52	28.33	423968.8	6067829.1	423971.5	6067820.6	54.751948°N	1.818677°E	54.751872°N	1.818721°E
TA_CAM_42	07/05/2011	20:10	26.64	418077.6	6070516.3	418074.6	6070518.9	54.775165°N	1.726410°E	54.775188°N	1.726362°E
TA_CAM_43	06/06/2011	19:38	27.01	394108.8	6083248.4	394095.8	6083247.6	54.885054°N	1.349274°E	54.885045°N	1.349073°E
TA_CAM_44	06/06/2011	22:24	28.30	396495.0	6085553.0	396494.4	6085539.6	54.906256°N	1.385628°E	54.906136°N	1.385624°E
TA_CAM_45	02/06/2011	03:44	28.48	396066.7	6092501.5	396068.6	6092514.2	54.968585°N	1.376437°E	54.968700°N	1.376462°E
TA_CAM_46	02/06/2011	02:35	27.48	397685.7	6089717.9	397692.2	6089716.1	54.943915°N	1.402709°E	54.943900°N	1.402811°E
TA_CAM_47	30/05/2011	21:54	25.97	433689.9	6097586.6	433700.2	6097577.9	55.020699°N	1.962842°E	55.020623°N	1.963005°E
TA_CAM_48	30/05/2011	21:00	25.32	430643.0	6099845.1	430636.6	6099873.8	55.040576°N	1.914646°E	55.040833°N	1.914539°E

Site	Date	Start Time (GMT)	Actual Start Depth (m BSL)	WGS84 UTM Z31N				WGS84 (DD)			
				Start Position		End Position		Start Position		End Position	
				Eastings	Northings	Eastings	Northings	Latitude	Longitude	Latitude	Longitude
TA_CAM_49	08/06/2011	21:56	29.98	427446.4	6102368.1	427446.0	6102362.9	55.062788°N	1.863992°E	55.062741°N	1.863987°E
TA_CAM_50	08/06/2011	20:42	32.79	424259.0	6103752.4	424261.5	6103752.2	55.074749°N	1.813729°E	55.074748°N	1.813769°E
TA_CAM_51	16/06/2011	19:56	29.52	420778.8	6104849.2	420769.2	6104846.5	55.084060°N	1.758931°E	55.084034°N	1.758780°E
TA_CAM_52	16/06/2011	21:00	32.44	416986.4	6105057.9	416999.3	6105087.5	55.085316°N	1.699475°E	55.085583°N	1.699669°E
TA_CAM_53	16/06/2011	22:36	32.12	413511.3	6105049.2	413505.5	6105049.0	55.084643°N	1.645052°E	55.084641°N	1.644961°E
TA_CAM_54	11/05/2011	02:22	30.90	415507.9	6101761.4	415514.2	6101792.1	55.055450°N	1.677296°E	55.055727°N	1.677385°E
TA_CAM_55	10/05/2011	23:06	29.27	418791.8	6097372.1	418764.4	6097396.1	55.016563°N	1.729938°E	55.016775°N	1.729503°E
TA_CAM_56	10/05/2011	20:29	26.55	420972.2	6091421.0	420967.9	6091423.8	54.963448°N	1.765673°E	54.963472°N	1.765604°E
TA_CAM_57	08/06/2011	23:12	28.06	424765.0	6100174.7	424765.6	6100179.3	55.042683°N	1.822597°E	55.042724°N	1.822604°E
TA_CAM_58	10/05/2011	21:55	29.33	425380.0	6094190.1	425352.7	6094198.3	54.989007°N	1.833781°E	54.989076°N	1.833351°E
TA_CAM_59	10/05/2011	19:17	27.84	427249.3	6090131.3	427213.9	6090108.4	54.952816°N	1.864018°E	54.952605°N	1.863471°E
TA_CAM_60	11/05/2011	00:30	30.67	420571.4	6100189.5	420583.5	6100183.5	55.042163°N	1.756981°E	55.042111°N	1.757172°E
TA_CAM_61	10/05/2011	18:18	25.04	431841.7	6092128.3	431823.8	6092105.0	54.971407°N	1.935239°E	54.971196°N	1.934965°E
TA_CAM_62	01/06/2011	17:51	35.76	397389.6	6101172.2	397385.6	6101153.4	55.046747°N	1.393984°E	55.046577°N	1.393929°E
TA_CAM_63	01/06/2011	18:44	33.13	400367.0	6101983.2	400372.0	6101961.1	55.054638°N	1.440282°E	55.054440°N	1.440369°E
TA_CAM_64	17/06/2011	01:20	35.75	404272.6	6102830.4	404246.6	6102873.6	55.063016°N	1.501114°E	55.063399°N	1.500693°E
TA_CAM_65	17/06/2011	00:27	34.07	407730.3	6103399.0	407719.8	6103399.6	55.068778°N	1.555051°E	55.068782°N	1.554887°E
TA_CAM_66	02/06/2011	01:25	31.45	400478.2	6089524.3	400482.1	6089499.5	54.942741°N	1.446353°E	54.942519°N	1.446423°E
TA_CAM_67	07/06/2011	02:00	27.79	404441.2	6088027.1	404444.4	6088025.7	54.930065°N	1.508695°E	54.930053°N	1.508746°E
TA_CAM_68	15/06/2011	22:30	22.52	409526.0	6087830.9	409530.3	6087832.9	54.929250°N	1.588083°E	54.929269°N	1.588149°E
TA_CAM_69	09/05/2011	19:31	30.99	413410.1	6085837.7	413422.4	6085829.9	54.912031°N	1.649278°E	54.911964°N	1.649473°E
TA_CAM_70	14/06/2011	23:06	28.10	419876.9	6083667.1	419888.7	6083659.9	54.893609°N	1.750730°E	54.893546°N	1.750917°E
TA_CAM_71	25/06/2011	13:21	30.86	410725.5	6095293.9	410752.0	6095287.7	54.996512°N	1.604474°E	54.996461°N	1.604889°E
TA_CAM_72	01/06/2011	19:42	32.97	400876.0	6098076.7	400858.8	6098080.0	55.019647°N	1.449604°E	55.019674°N	1.449332°E
TA_CAM_73	01/06/2011	21:41	33.90	405487.9	6093630.7	405484.0	6093617.4	54.980604°N	1.523178°E	54.980484°N	1.523122°E
TA_CAM_74	15/06/2011	21:30	24.67	407737.4	6084148.9	407732.0	6084156.1	54.895844°N	1.561360°E	54.895908°N	1.561274°E
TA_CAM_75	15/06/2011	20:24	27.72	403557.1	6082760.0	403553.2	6082762.9	54.882578°N	1.496667°E	54.882604°N	1.496605°E
TA_CAM_76	07/05/2011	23:04	22.09	419580.1	6064439.1	419583.0	6064448.4	54.720806°N	1.751442°E	54.720890°N	1.751485°E
TA_CAM_77	02/06/2011	00:27	33.36	400072.5	6093206.5	400090.3	6093197.1	54.975737°N	1.438741°E	54.975656°N	1.439022°E
TA_CAM_78	01/06/2011	22:43	33.30	402236.1	6095708.9	402249.2	6095710.7	54.998646°N	1.471678°E	54.998665°N	1.471882°E
TA_CAM_79	01/06/2011	20:36	33.94	404457.4	6097989.9	404444.3	6097982.0	55.019568°N	1.505627°E	55.019495°N	1.505425°E
TA_CAM_80	10/06/2011	22:36	24.59	429738.1	6080364.3	429740.7	6080364.2	54.865417°N	1.905257°E	54.865416°N	1.905297°E
TA_CAM_81	29/05/2011	23:49	25.50	439394.0	6089127.0	439384.5	6089128.4	54.945416°N	2.053835°E	54.945427°N	2.053686°E
TA_CAM_82	14/06/2011	21:24	29.96	416690.2	6079576.1	416691.4	6079568.0	54.856334°N	1.702240°E	54.856261°N	1.702260°E
TA_CAM_83	19/05/2011	20:23	30.68	431337.6	6073327.9	431322.1	6073297.0	54.802417°N	1.931844°E	54.802137°N	1.931610°E
TA_CAM_84	30/05/2011	20:08	31.36	430844.0	6103148.0	430835.2	6103169.0	55.070280°N	1.916990°E	55.070467°N	1.916847°E
TA_CAM_85	25/05/2011	18:29	26.37	457285.6	6083857.5	457291.3	6083859.1	54.899917°N	2.333911°E	54.899932°N	2.333999°E
TA_CAM_85	25/05/2011	19:06	26.21	457311.5	6083843.6	457301.3	6083839.7	54.899794°N	2.334317°E	54.899758°N	2.334159°E
TA_CAM_86	15/06/2011	23:52	30.37	415300.0	6091917.9	415303.9	6091902.8	54.966981°N	1.676957°E	54.966846°N	1.677023°E
TA_CAM_87	06/06/2011	23:52	30.03	394823.1	6090521.8	394838.9	6090543.9	54.950541°N	1.357745°E	54.950742°N	1.357984°E
TA_CAM_88	06/06/2011	19:07	28.15	393771.7	6083894.5	393770.3	6083903.9	54.890786°N	1.343783°E	54.890870°N	1.343758°E
TA_CAM_89	06/06/2011	20:21	28.06	394924.6	6081943.5	394924.3	6081935.9	54.873504°N	1.362462°E	54.873436°N	1.362459°E
TA_CAM_90	25/06/2011	18:31	36.69	398032.6	6105962.9	398021.3	6105952.3	55.089913°N	1.402330°E	55.089816°N	1.402157°E
TA_CAM_91	25/06/2011	17:44	35.01	401097.3	6105973.3	401096.4	6105963.5	55.090627°N	1.450325°E	55.090539°N	1.450315°E
TA_CAM_92	25/06/2011	17:02	33.40	402159.3	6104135.3	402172.4	6104123.1	55.074326°N	1.467590°E	55.074219°N	1.467799°E

Site	Date	Start Time (GMT)	Actual Start Depth (m BSL)	WGS84 UTM Z31N				WGS84 (DD)			
				Start Position		End Position		Start Position		End Position	
				Eastings	Northings	Eastings	Northings	Latitude	Longitude	Latitude	Longitude
TA_CAM_93	11/05/2011	03:41	31.27	407398.7	6105412.9	407488.9	6105424.8	55.086808°N	1.549205°E	55.086932°N	1.550615°E
TA_CAM_94	25/06/2011	15:18	28.13	411247.2	6097950.8	411278.9	6097957.2	55.020474°N	1.611802°E	55.020537°N	1.612295°E
TA_CAM_95	25/06/2011	14:38	30.09	409297.2	6097099.1	409314.0	6097102.7	55.012471°N	1.581581°E	55.012506°N	1.581843°E
TA_CAM_96	09/05/2011	18:51	27.01	414723.8	6086024.5	414763.0	6086045.2	54.913936°N	1.669710°E	54.914128°N	1.670314°E
TA_CAM_97	15/06/2011	19:17	29.95	404193.9	6086002.4	404195.0	6086007.1	54.911828°N	1.505512°E	54.911871°N	1.505526°E
TA_CAM_98	16/06/2011	21:53	32.79	414325.7	6105919.4	414323.7	6105920.6	55.092603°N	1.657545°E	55.092613°N	1.657514°E
TA_CAM_99	11/05/2011	01:23	29.63	419510.1	6101509.0	419532.0	6101526.4	55.053847°N	1.740003°E	55.054007°N	1.740341°E
TA_CAM_100	10/05/2011	21:03	27.45	422283.1	6091758.3	422265.4	6091756.0	54.966685°N	1.786050°E	54.966661°N	1.785775°E
TA_CAM_101	10/06/2011	02:53	23.19	429501.2	6083815.8	429487.8	6083832.3	54.896395°N	1.900722°E	54.896541°N	1.900510°E
TA_CAM_102	31/05/2011	23:57	30.91	441132.4	6095860.6	441102.3	6095861.8	55.006127°N	2.079587°E	55.006135°N	2.079117°E
TA_CAM_103	06/06/2011	03:40	24.26	436248.3	6085925.6	436248.6	6085904.2	54.916258°N	2.005443°E	54.916066°N	2.005452°E
TA_CAM_104	29/05/2011	21:46	26.96	446317.9	6089109.9	446311.8	6089088.7	54.946055°N	2.161919°E	54.945864°N	2.161827°E
TA_CAM_105	08/05/2011	21:23	29.75	426427.0	6063951.8	426456.4	6063958.3	54.717475°N	1.857842°E	54.717538°N	1.858297°E
TA_CAM_106	07/05/2011	20:58	27.15	415001.8	6072019.0	415015.7	6072016.5	54.788154°N	1.678166°E	54.788134°N	1.678383°E

APPENDIX III STATIC IMAGES

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Site	Date	UTM WGS84 Z31N		WGS84 (DD)	
		Eastings	Northings	Latitude	Longitude
CABA_CAM_01	25/06/2011	385657.9	6067938.0	54.745670°N	1.223648°E
CABA_CAM_01	25/06/2011	385652.8	6067970.6	54.745961°N	1.223557°E
CABA_CAM_01	25/06/2011	385637.6	6067979.7	54.746039°N	1.223318°E
CABA_CAM_02	25/06/2011	384963.3	6067754.8	54.743866°N	1.212936°E
CABA_CAM_02	25/06/2011	384959.6	6067754.8	54.743865°N	1.212878°E
CABA_CAM_02	25/06/2011	384947.9	6067754.3	54.743858°N	1.212698°E
CABA_CAM_03	25/06/2011	384333.7	6068323.2	54.748827°N	1.202934°E
CABA_CAM_03	25/06/2011	384321.6	6068325.4	54.748844°N	1.202745°E
CABA_CAM_03	25/06/2011	384335.6	6068308.8	54.748698°N	1.202970°E
CABA_CAM_04	23/06/2011	383674.7	6067389.9	54.740291°N	1.193074°E
CABA_CAM_04	23/06/2011	383654.6	6067376.9	54.740170°N	1.192769°E
CABA_CAM_04	23/06/2011	383646.6	6067382.1	54.740214°N	1.192642°E
CABA_CAM_05	23/06/2011	380299.3	6066192.5	54.728744°N	1.141166°E
CABA_CAM_05	23/06/2011	380304.5	6066196.2	54.728779°N	1.141246°E
CABA_CAM_05	23/06/2011	380312.9	6066193.3	54.728754°N	1.141376°E
CABA_CAM_06	23/06/2011	377246.4	6064031.0	54.708594°N	1.094697°E
CABA_CAM_06	23/06/2011	377236.5	6064033.9	54.708617°N	1.094544°E
CABA_CAM_06	23/06/2011	377247.6	6064026.6	54.708555°N	1.094718°E
CABA_CAM_07	23/06/2011	366721.9	6058606.0	54.657195°N	0.933933°E
CABA_CAM_07	23/06/2011	366706.7	6058605.1	54.657183°N	0.933698°E
CABA_CAM_07	23/06/2011	366715.6	6058597.6	54.657118°N	0.933840°E
CABA_CAM_08	23/06/2011	363135.8	6055404.0	54.627478°N	0.879881°E
CABA_CAM_08	23/06/2011	363122.1	6055401.9	54.627455°N	0.879670°E
CABA_CAM_08	23/06/2011	363129.7	6055395.3	54.627398°N	0.879791°E
CABA_CAM_09	23/06/2011	353871.8	6043818.1	54.520839°N	0.742257°E
CABA_CAM_09	23/06/2011	353869.9	6043816.7	54.520827°N	0.742228°E
CABA_CAM_09	23/06/2011	353866.2	6043824.9	54.520899°N	0.742167°E
CABA_CAM_10	23/06/2011	348245.4	6035189.7	54.441707°N	0.659835°E
CABA_CAM_10	23/06/2011	348250.4	6035194.2	54.441748°N	0.659910°E
CABA_CAM_10	23/06/2011	348246.6	6035207.7	54.441868°N	0.659845°E
CABA_CAM_11	23/06/2011	343810.4	6029290.9	54.387395°N	0.594615°E
CABA_CAM_11	23/06/2011	343809.7	6029294.9	54.387431°N	0.594602°E
CABA_CAM_11	23/06/2011	343786.7	6029262.1	54.387129°N	0.594265°E
CABA_CAM_12	22/06/2011	343472.0	6026929.6	54.366088°N	0.590651°E
CABA_CAM_12	22/06/2011	343474.4	6026945.9	54.366235°N	0.590680°E
CABA_CAM_12	22/06/2011	343469.2	6026943.7	54.366214°N	0.590600°E
CABA_CAM_13	22/06/2011	339706.9	6019886.4	54.301677°N	0.536541°E
CABA_CAM_13	22/06/2011	339702.0	6019900.4	54.301801°N	0.536459°E
CABA_CAM_13	22/06/2011	339704.0	6019887.6	54.301686°N	0.536497°E
CABA_CAM_14	22/06/2011	338735.2	6017551.9	54.280409°N	0.522883°E
CABA_CAM_14	22/06/2011	338748.9	6017554.2	54.280434°N	0.523091°E
CABA_CAM_14	22/06/2011	338752.0	6017553.7	54.280431°N	0.523139°E
CABA_CAM_15	22/06/2011	334238.1	6013782.3	54.245125°N	0.455965°E
CABA_CAM_15	22/06/2011	334225.3	6013787.1	54.245164°N	0.455765°E
CABA_CAM_15	22/06/2011	334229.3	6013763.3	54.244952°N	0.455839°E
CABA_CAM_16A	22/06/2011	331986.2	6013089.3	54.238170°N	0.421830°E
CABA_CAM_16A	22/06/2011	331972.5	6013091.4	54.238184°N	0.421619°E
CABA_CAM_16A	22/06/2011	332001.7	6013085.8	54.238143°N	0.422069°E
CABA_CAM_17	22/06/2011	331109.7	6012190.3	54.229810°N	0.408901°E
CABA_CAM_17	22/06/2011	331108.4	6012191.9	54.229824°N	0.408880°E
CABA_CAM_17	22/06/2011	331134.4	6012175.6	54.229685°N	0.409288°E

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CABA_CAM_18	22/06/2011	327833.3	6010047.7	54.209483°N	0.359921°E
CABA_CAM_18	22/06/2011	327835.2	6010053.1	54.209532°N	0.359947°E
CABA_CAM_18	22/06/2011	327823.3	6010047.5	54.209477°N	0.359768°E
CABA_CAM_19	22/06/2011	327572.8	6006957.9	54.181655°N	0.357704°E
CABA_CAM_19	22/06/2011	327568.5	6006961.7	54.181687°N	0.357635°E
CABA_CAM_19	22/06/2011	327575.1	6006963.0	54.181701°N	0.357736°E
CABA_CAM_20	22/06/2011	325524.7	6008452.4	54.194380°N	0.325489°E
CABA_CAM_20	22/06/2011	325515.5	6008458.5	54.194432°N	0.325344°E
CABA_CAM_20	22/06/2011	325517.5	6008449.4	54.194350°N	0.325380°E
CABA_CAM_21	22/06/2011	326978.5	6005811.8	54.171165°N	0.349266°E
CABA_CAM_21	22/06/2011	327005.3	6005823.5	54.171279°N	0.349668°E
CABA_CAM_21	22/06/2011	326976.4	6005824.6	54.171279°N	0.349226°E
CABA_CAM_22	22/06/2011	323300.2	6006468.7	54.175810°N	0.292596°E
CABA_CAM_22	22/06/2011	323336.8	6006455.7	54.175705°N	0.293164°E
CABA_CAM_22	22/06/2011	323295.4	6006466.4	54.175787°N	0.292523°E
CABA_CAM_23	21/06/2011	319167.4	6004733.2	54.158791°N	0.230396°E
CABA_CAM_23	22/06/2011	319192.0	6004735.0	54.158815°N	0.230770°E
CABA_CAM_23	22/06/2011	319178.5	6004730.2	54.158767°N	0.230567°E
CABA_CAM_24	26/06/2011	408020.4	6076047.4	54.823114°N	1.568353°E
CABA_CAM_24	26/06/2011	408022.3	6076047.4	54.823114°N	1.568382°E
CABA_CAM_24	26/06/2011	408022.3	6076047.4	54.823114°N	1.568382°E
CABA_CAM_25	26/06/2011	409241.6	6066810.5	54.740352°N	1.590243°E
CABA_CAM_25	26/06/2011	409242.6	6066808.8	54.740337°N	1.590259°E
CABA_CAM_25	26/06/2011	409240.8	6066805.3	54.740306°N	1.590233°E
CABA_CAM_26	26/06/2011	405347.7	6068151.6	54.751683°N	1.529344°E
CABA_CAM_26	26/06/2011	405352.8	6068163.7	54.751792°N	1.529420°E
CABA_CAM_26	26/06/2011	405351.4	6068147.5	54.751646°N	1.529403°E
CABA_CAM_27	25/06/2011	402827.5	6073674.1	54.800813°N	1.488352°E
CABA_CAM_27	25/06/2011	402833.2	6073671.5	54.800791°N	1.488443°E
CABA_CAM_27	25/06/2011	402833.2	6073675.1	54.800824°N	1.488442°E
CABA_CAM_28	25/06/2011	398271.0	6076272.5	54.823252°N	1.416587°E
CABA_CAM_28	25/06/2011	398262.9	6076269.1	54.823220°N	1.416462°E
CABA_CAM_28	25/06/2011	398269.5	6076269.5	54.823225°N	1.416565°E
CABA_CAM_29	25/06/2011	392500.0	6078234.2	54.839670°N	1.326075°E
CABA_CAM_29	25/06/2011	392493.9	6078245.2	54.839767°N	1.325975°E
CABA_CAM_29	25/06/2011	392492.4	6078244.4	54.839759°N	1.325952°E
CABA_CAM_30	25/06/2011	399411.5	6072526.9	54.789834°N	1.435632°E
CABA_CAM_30	25/06/2011	399405.7	6072530.7	54.789867°N	1.435541°E
CABA_CAM_30	25/06/2011	399404.2	6072530.7	54.789867°N	1.435518°E
CABA_CAM_31	26/06/2011	401907.1	6068592.0	54.754979°N	1.475758°E
CABA_CAM_31	26/06/2011	401903.1	6068587.7	54.754939°N	1.475698°E
CABA_CAM_31	26/06/2011	401922.3	6068559.8	54.754693°N	1.476005°E
CABA_CAM_32	26/06/2011	394883.9	6073030.5	54.793431°N	1.365068°E
CABA_CAM_32	26/06/2011	394891.5	6073037.2	54.793492°N	1.365182°E
CABA_CAM_32	26/06/2011	394880.6	6073036.4	54.793483°N	1.365013°E
CABA_CAM_33	26/06/2011	388963.3	6076044.7	54.819230°N	1.271871°E
CABA_CAM_33	26/06/2011	388965.3	6076047.6	54.819257°N	1.271900°E
CABA_CAM_33	26/06/2011	388988.1	6076079.0	54.819544°N	1.272244°E
CABA_CAM_34	26/06/2011	397266.7	6067053.8	54.740234°N	1.404226°E
CABA_CAM_34	26/06/2011	397267.7	6067078.2	54.740453°N	1.404233°E
CABA_CAM_34	26/06/2011	397278.1	6067050.8	54.740209°N	1.404404°E
CABA_CAM_35	26/06/2011	393177.1	6066916.1	54.738144°N	1.340781°E
CABA_CAM_35	26/06/2011	393177.1	6066919.3	54.738173°N	1.340781°E
CABA_CAM_35	26/06/2011	393159.3	6066978.3	54.738699°N	1.340482°E
CABA_CAM_36	26/06/2011	385282.2	6073081.9	54.791789°N	1.215783°E

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CABA_CAM_36	26/06/2011	385312.1	6073114.4	54.792087°N	1.216234°E
CABA_CAM_36	26/06/2011	385261.1	6073074.1	54.791714°N	1.215458°E
CABA_CAM_37	26/06/2011	388512.5	6066311.6	54.731701°N	1.268597°E
CABA_CAM_37	26/06/2011	388508.8	6066314.3	54.731725°N	1.268538°E
CABA_CAM_37	26/06/2011	388514.4	6066311.7	54.731703°N	1.268627°E
CABA_CAM_38	26/06/2011	381390.9	6070531.1	54.767972°N	1.156338°E
CABA_CAM_38	26/06/2011	381378.4	6070553.5	54.768171°N	1.156135°E
CABA_CAM_38	26/06/2011	381372.2	6070528.0	54.767941°N	1.156048°E
CABA_CAM_39	26/06/2011	385200.1	6064075.1	54.710867°N	1.218064°E
CABA_CAM_39	26/06/2011	385197.6	6064077.6	54.710889°N	1.218024°E
CABA_CAM_39	26/06/2011	385202.0	6064092.3	54.711021°N	1.218087°E
CABA_CAM_40	26/06/2011	380314.6	6062552.4	54.696052°N	1.142899°E
CABA_CAM_40	26/06/2011	380317.4	6062564.2	54.696159°N	1.142938°E
CABA_CAM_40	26/06/2011	380327.9	6062575.8	54.696265°N	1.143096°E
CABA_CAM_41	26/06/2011	375284.2	6066531.0	54.730566°N	1.063190°E
CABA_CAM_41	26/06/2011	375288.5	6066541.3	54.730660°N	1.063253°E
CABA_CAM_41	26/06/2011	375288.5	6066521.1	54.730478°N	1.063261°E
CABA_CAM_42	26/06/2011	376043.0	6060095.9	54.672955°N	1.077703°E
CABA_CAM_42	26/06/2011	376042.7	6060101.7	54.673006°N	1.077695°E
CABA_CAM_42	26/06/2011	376048.9	6060103.3	54.673022°N	1.077792°E
CABA_CAM_43	26/06/2011	372662.1	6056857.1	54.643022°N	1.026717°E
CABA_CAM_43	26/06/2011	372651.1	6056868.8	54.643125°N	1.026542°E
CABA_CAM_43	26/06/2011	372651.9	6056859.0	54.643036°N	1.026559°E
CABA_CAM_44	26/06/2011	368114.1	6063333.3	54.700018°N	0.953365°E
CABA_CAM_44	26/06/2011	368098.4	6063336.5	54.700042°N	0.953120°E
CABA_CAM_44	26/06/2011	368124.9	6063325.0	54.699946°N	0.953537°E
CABA_CAM_45	26/06/2011	363304.1	6059977.9	54.668601°N	0.880349°E
CABA_CAM_45	26/06/2011	363292.7	6059980.6	54.668622°N	0.880171°E
CABA_CAM_45	26/06/2011	363302.0	6059980.7	54.668626°N	0.880315°E
CABA_CAM_46	27/06/2011	367147.4	6055324.4	54.627835°N	0.942014°E
CABA_CAM_46	27/06/2011	367152.7	6055322.9	54.627822°N	0.942098°E
CABA_CAM_46	27/06/2011	367150.5	6055317.8	54.627777°N	0.942066°E
CABA_CAM_47	26/06/2011	358950.2	6059524.3	54.663328°N	0.813109°E
CABA_CAM_47	26/06/2011	358970.5	6059480.5	54.662940°N	0.813445°E
CABA_CAM_47	26/06/2011	358965.6	6059479.0	54.662926°N	0.813370°E
CABA_CAM_48	27/06/2011	362724.7	6052085.6	54.597564°N	0.875072°E
CABA_CAM_48	27/06/2011	362715.6	6052085.7	54.597563°N	0.874931°E
CABA_CAM_48	27/06/2011	362695.5	6052073.5	54.597448°N	0.874626°E
CABA_CAM_49	27/06/2011	356928.3	6051530.4	54.590971°N	0.785691°E
CABA_CAM_49	27/06/2011	356934.2	6051522.7	54.590903°N	0.785786°E
CABA_CAM_49	27/06/2011	356931.9	6051528.4	54.590954°N	0.785748°E
CABA_CAM_50	27/06/2011	352804.7	6049616.3	54.572599°N	0.722885°E
CABA_CAM_50	27/06/2011	352805.2	6049616.5	54.572601°N	0.722892°E
CABA_CAM_50	27/06/2011	352808.7	6049613.0	54.572570°N	0.722948°E
CABA_CAM_51	27/06/2011	356866.5	6042564.9	54.510440°N	0.789096°E
CABA_CAM_51	27/06/2011	356869.7	6042564.8	54.510440°N	0.789145°E
CABA_CAM_51	27/06/2011	356859.5	6042557.4	54.510370°N	0.788991°E
CABA_CAM_52	27/06/2011	353046.8	6039035.8	54.477655°N	0.731901°E
CABA_CAM_52	27/06/2011	353075.6	6039036.0	54.477666°N	0.732346°E
CABA_CAM_52	27/06/2011	353075.1	6039063.7	54.477914°N	0.732324°E
CABA_CAM_53	27/06/2011	348626.2	6042440.4	54.506929°N	0.661990°E
CABA_CAM_53	27/06/2011	348628.4	6042428.1	54.506819°N	0.662031°E
CABA_CAM_53	27/06/2011	348630.4	6042425.4	54.506795°N	0.662062°E
CABA_CAM_54	27/06/2011	346094.6	6036382.2	54.451768°N	0.626080°E
CABA_CAM_54	27/06/2011	346099.0	6036386.1	54.451804°N	0.626146°E

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CABA_CAM_54	27/06/2011	346087.1	6036381.0	54.451754°N	0.625965°E
CABA_CAM_55	28/06/2011	348985.8	6033118.8	54.423331°N	0.672297°E
CABA_CAM_55	28/06/2011	349012.8	6033090.5	54.423084°N	0.672728°E
CABA_CAM_55	28/06/2011	349019.6	6033118.6	54.423339°N	0.672818°E
CABA_CAM_56	28/06/2011	341379.9	6033174.1	54.421512°N	0.555147°E
CABA_CAM_56	28/06/2011	341388.0	6033178.3	54.421553°N	0.555270°E
CABA_CAM_56	28/06/2011	341374.2	6033181.0	54.421572°N	0.555056°E
CABA_CAM_57	28/06/2011	347863.9	6028355.3	54.380220°N	0.657460°E
CABA_CAM_57	28/06/2011	347860.9	6028349.5	54.380168°N	0.657417°E
CABA_CAM_57	28/06/2011	347842.9	6028340.6	54.380083°N	0.657145°E
CABA_CAM_58	28/06/2011	340376.2	6027660.4	54.371691°N	0.542655°E
CABA_CAM_58	28/06/2011	340372.2	6027661.7	54.371701°N	0.542593°E
CABA_CAM_58	28/06/2011	340391.0	6027662.8	54.371716°N	0.542882°E
CABA_CAM_59	28/06/2011	345720.6	6024069.1	54.341087°N	0.626710°E
CABA_CAM_59	28/06/2011	345714.7	6024054.8	54.340957°N	0.626628°E
CABA_CAM_59	28/06/2011	345710.4	6024080.8	54.341190°N	0.626548°E
CABA_CAM_60	28/06/2011	343177.2	6020448.3	54.307799°N	0.589526°E
CABA_CAM_60	28/06/2011	343170.9	6020458.0	54.307885°N	0.589425°E
CABA_CAM_60	28/06/2011	343193.0	6020446.0	54.307783°N	0.589771°E
CABA_CAM_61	28/06/2011	338453.3	6022158.5	54.321683°N	0.516066°E
CABA_CAM_61	28/06/2011	338456.1	6022176.0	54.321841°N	0.516100°E
CABA_CAM_61	28/06/2011	338456.1	6022158.0	54.321679°N	0.516109°E
CABA_CAM_62	28/06/2011	335922.2	6019522.9	54.297212°N	0.478637°E
CABA_CAM_62	28/06/2011	335927.6	6019524.5	54.297228°N	0.478719°E
CABA_CAM_62	28/06/2011	335931.4	6019516.5	54.297158°N	0.478782°E
CABA_CAM_63	28/06/2011	338690.3	6014400.5	54.252099°N	0.523891°E
CABA_CAM_63	28/06/2011	338704.6	6014341.9	54.251577°N	0.524142°E
CABA_CAM_63	28/06/2011	338690.5	6014409.5	54.252179°N	0.523888°E
CABA_CAM_64	28/06/2011	333143.2	6016398.6	54.268260°N	0.437722°E
CABA_CAM_64	28/06/2011	333132.1	6016401.0	54.268278°N	0.437550°E
CABA_CAM_64	28/06/2011	333125.6	6016396.4	54.268235°N	0.437454°E
CABA_CAM_65	28/06/2011	329783.0	6015663.5	54.260554°N	0.386599°E
CABA_CAM_65	28/06/2011	329771.5	6015667.1	54.260582°N	0.386420°E
CABA_CAM_65	28/06/2011	329774.5	6015658.4	54.260505°N	0.386471°E
CABA_CAM_66	28/06/2011	333491.7	6008517.5	54.197613°N	0.447440°E
CABA_CAM_66	28/06/2011	333497.2	6008511.1	54.197557°N	0.447528°E
CABA_CAM_66	28/06/2011	333492.9	6008510.1	54.197547°N	0.447462°E
CABA_CAM_67	28/06/2011	325211.8	6013873.4	54.242942°N	0.317544°E
CABA_CAM_67	28/06/2011	325189.1	6013888.4	54.243069°N	0.317187°E
CABA_CAM_67	28/06/2011	325209.6	6013876.1	54.242965°N	0.317508°E
CABA_CAM_68	28/06/2011	330170.4	6003315.2	54.149816°N	0.399516°E
CABA_CAM_68	28/06/2011	330168.7	6003320.9	54.149866°N	0.399487°E
CABA_CAM_68	28/06/2011	330186.6	6003326.8	54.149925°N	0.399758°E
CABA_CAM_69	28/06/2011	322158.5	6009274.5	54.200605°N	0.273467°E
CABA_CAM_69	28/06/2011	322163.3	6009276.4	54.200623°N	0.273539°E
CABA_CAM_69	28/06/2011	322131.5	6009273.1	54.200582°N	0.273054°E
CABA_CAM_70	28/06/2011	323720.0	6000648.0	54.123697°N	0.302421°E
CABA_CAM_70	28/06/2011	323693.1	6000660.8	54.123803°N	0.302004°E
CABA_CAM_70	28/06/2011	323715.6	6000643.7	54.123657°N	0.302357°E
CABA_CAM_71	29/06/2011	410501.5	6074910.6	54.813350°N	1.607310°E
CABA_CAM_71	29/06/2011	410493.4	6074907.2	54.813318°N	1.607185°E
CABA_CAM_71	29/06/2011	410492.4	6074907.3	54.813319°N	1.607168°E
CABA_CAM_72	29/06/2011	403856.0	6070975.4	54.776767°N	1.505241°E
CABA_CAM_72	29/06/2011	403835.7	6070969.1	54.776707°N	1.504928°E
CABA_CAM_72	29/06/2011	403853.1	6070994.2	54.776936°N	1.505190°E

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CABA_CAM_73	29/06/2011	407023.2	6071116.8	54.778634°N	1.554418°E
CABA_CAM_73	29/06/2011	407002.8	6071094.1	54.778426°N	1.554109°E
CABA_CAM_73	29/06/2011	407009.2	6071086.6	54.778361°N	1.554212°E
CABA_CAM_74	29/06/2011	407975.6	6073522.3	54.800421°N	1.568458°E
CABA_CAM_74	29/06/2011	407976.4	6073526.9	54.800462°N	1.568470°E
CABA_CAM_74	29/06/2011	408000.4	6073515.1	54.800361°N	1.568845°E
CABA_CAM_75	29/06/2011	389468.6	6068958.1	54.755686°N	1.282431°E
CABA_CAM_75	29/06/2011	389484.0	6068960.7	54.755712°N	1.282669°E
CABA_CAM_75	29/06/2011	389478.8	6068917.2	54.755320°N	1.282606°E
CABA_CAM_76	29/06/2011	397708.2	6069537.0	54.762631°N	1.410207°E
CABA_CAM_76	29/06/2011	397705.8	6069546.1	54.762712°N	1.410167°E
CABA_CAM_76	29/06/2011	397691.0	6069541.9	54.762672°N	1.409939°E
CABA_CAM_77	29/06/2011	393112.9	6069835.0	54.764351°N	1.338711°E
CABA_CAM_77	29/06/2011	393112.8	6069846.5	54.764455°N	1.338706°E
CABA_CAM_77	29/06/2011	393130.5	6069838.3	54.764385°N	1.338983°E
CABA_CAM_78	29/06/2011	398847.6	6079530.0	54.852632°N	1.424419°E
CABA_CAM_78	29/06/2011	398831.9	6079526.5	54.852597°N	1.424175°E
CABA_CAM_78	29/06/2011	398818.7	6079527.0	54.852600°N	1.423970°E
CABA_CAM_79	29/06/2011	395908.1	6076851.9	54.827972°N	1.379616°E
CABA_CAM_79	29/06/2011	395904.2	6076860.7	54.828050°N	1.379552°E
CABA_CAM_79	29/06/2011	395900.8	6076867.0	54.828106°N	1.379497°E
CABA_CAM_80	29/06/2011	394756.4	6076119.8	54.821155°N	1.361962°E
CABA_CAM_80	29/06/2011	394742.8	6076112.7	54.821088°N	1.361753°E
CABA_CAM_80	29/06/2011	394718.4	6076112.4	54.821080°N	1.361374°E
CABA_CAM_81	29/06/2011	392076.7	6073792.3	54.799678°N	1.321142°E
CABA_CAM_81	29/06/2011	392110.3	6073790.9	54.799672°N	1.321664°E
CABA_CAM_81	30/06/2011	392079.9	6073805.5	54.799797°N	1.321186°E
CABA_CAM_82	30/06/2011	388348.7	6071284.6	54.776336°N	1.264144°E
CABA_CAM_82	30/06/2011	388378.5	6071265.9	54.776174°N	1.264614°E
CABA_CAM_82	30/06/2011	388319.5	6071270.5	54.776202°N	1.263695°E
TA_CAM_01	26/05/2011	451732.3	6081262.3	54.876092°N	2.247755°E
TA_CAM_01	26/05/2011	451732.4	6081257.5	54.876049°N	2.247757°E
TA_CAM_01	26/05/2011	451728.8	6081253.3	54.876011°N	2.247701°E
TA_CAM_02	26/05/2011	449342.5	6079357.9	54.858742°N	2.210848°E
TA_CAM_02	26/05/2011	449333.5	6079360.5	54.858765°N	2.210707°E
TA_CAM_02	26/05/2011	449361.2	6079366.2	54.858819°N	2.211138°E
TA_CAM_03	31/05/2011	449631.5	6075993.7	54.828541°N	2.215936°E
TA_CAM_03	31/05/2011	449630.3	6075994.1	54.828545°N	2.215917°E
TA_CAM_03	31/05/2011	449623.1	6075991.6	54.828522°N	2.215807°E
TA_CAM_04	25/05/2011	447433.5	6085179.6	54.910858°N	2.180051°E
TA_CAM_04	25/05/2011	447451.6	6085149.6	54.910590°N	2.180340°E
TA_CAM_04	25/05/2011	447467.0	6085141.4	54.910518°N	2.180581°E
TA_CAM_05	31/05/2011	445173.1	6079674.8	54.861151°N	2.145844°E
TA_CAM_05	31/05/2011	445175.9	6079678.0	54.861180°N	2.145888°E
TA_CAM_05	31/05/2011	445178.7	6079672.1	54.861127°N	2.145932°E
TA_CAM_06	31/05/2011	445069.8	6072730.9	54.798744°N	2.145554°E
TA_CAM_06	31/05/2011	445063.7	6072697.6	54.798444°N	2.145465°E
TA_CAM_06	31/05/2011	445061.2	6072701.6	54.798480°N	2.145426°E
TA_CAM_07	29/05/2011	447243.9	6090320.6	54.957032°N	2.176150°E
TA_CAM_07	29/05/2011	447247.5	6090309.1	54.956930°N	2.176209°E
TA_CAM_07	29/05/2011	447251.9	6090312.1	54.956957°N	2.176277°E
TA_CAM_08	25/05/2011	453300.5	6087029.4	54.928063°N	2.271259°E
TA_CAM_08	25/05/2011	453294.9	6087033.2	54.928096°N	2.271170°E
TA_CAM_08	25/05/2011	453311.8	6087032.0	54.928087°N	2.271434°E
TA_CAM_09	25/05/2011	454803.8	6085632.8	54.915651°N	2.294935°E

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TA_CAM_09	25/05/2011	454807.0	6085630.6	54.915632°N	2.294985°E
TA_CAM_09	25/05/2011	454803.7	6085641.1	54.915726°N	2.294931°E
TA_CAM_10	30/05/2011	437573.8	6097676.0	55.022005°N	2.023561°E
TA_CAM_10	30/05/2011	437575.1	6097676.9	55.022013°N	2.023580°E
TA_CAM_10	30/05/2011	437569.8	6097675.4	55.022000°N	2.023498°E
TA_CAM_11	30/05/2011	440192.9	6093400.0	54.983906°N	2.065414°E
TA_CAM_11	30/05/2011	440190.5	6093400.4	54.983909°N	2.065376°E
TA_CAM_11	30/05/2011	440182.5	6093391.3	54.983827°N	2.065254°E
TA_CAM_12	29/05/2011	442367.3	6088512.7	54.940248°N	2.100369°E
TA_CAM_12	29/05/2011	442364.2	6088525.9	54.940366°N	2.100318°E
TA_CAM_12	29/05/2011	442367.8	6088520.9	54.940321°N	2.100376°E
TA_CAM_13	31/05/2011	443270.7	6083844.6	54.898407°N	2.115391°E
TA_CAM_13	31/05/2011	443272.1	6083850.2	54.898457°N	2.115411°E
TA_CAM_13	31/05/2011	443269.6	6083858.9	54.898535°N	2.115371°E
TA_CAM_14	10/06/2011	431930.3	6087648.9	54.931172°N	1.937685°E
TA_CAM_14	10/06/2011	431923.3	6087647.6	54.931160°N	1.937575°E
TA_CAM_14	10/06/2011	431920.0	6087641.9	54.931108°N	1.937526°E
TA_CAM_15	10/06/2011	425556.8	6078181.9	54.845204°N	1.840686°E
TA_CAM_15	10/06/2011	425551.1	6078181.1	54.845196°N	1.840596°E
TA_CAM_15	10/06/2011	425552.7	6078170.8	54.845104°N	1.840624°E
TA_CAM_16	19/05/2011	437524.1	6074486.6	54.813636°N	2.027818°E
TA_CAM_16	19/05/2011	437511.7	6074487.1	54.813640°N	2.027625°E
TA_CAM_16	19/05/2011	437518.2	6074478.5	54.813563°N	2.027730°E
TA_CAM_17	11/06/2011	423467.9	6086240.6	54.917294°N	1.806024°E
TA_CAM_17	11/06/2011	423472.5	6086233.4	54.917230°N	1.806096°E
TA_CAM_17	11/06/2011	423474.2	6086248.7	54.917367°N	1.806119°E
TA_CAM_18	06/06/2011	436262.4	6086539.0	54.921772°N	2.005527°E
TA_CAM_18	06/06/2011	436294.1	6086544.7	54.921827°N	2.006020°E
TA_CAM_18	06/06/2011	436307.0	6086558.7	54.921955°N	2.006219°E
TA_CAM_19	09/06/2011	438593.1	6083254.8	54.892554°N	2.042586°E
TA_CAM_19	09/06/2011	438559.1	6083283.8	54.892811°N	2.042050°E
TA_CAM_19	09/06/2011	438549.5	6083290.5	54.892870°N	2.041899°E
TA_CAM_20	10/06/2011	432929.8	6084357.0	54.901730°N	1.954048°E
TA_CAM_20	10/06/2011	432939.4	6084355.2	54.901714°N	1.954198°E
TA_CAM_20	10/06/2011	432926.3	6084338.2	54.901560°N	1.953997°E
TA_CAM_21	19/05/2011	436583.8	6080860.7	54.870792°N	2.011790°E
TA_CAM_21	19/05/2011	436582.3	6080862.9	54.870811°N	2.011767°E
TA_CAM_21	19/05/2011	436592.1	6080867.0	54.870849°N	2.011919°E
TA_CAM_22	09/06/2011	435507.0	6083846.2	54.897480°N	1.994347°E
TA_CAM_22	09/06/2011	435505.0	6083830.9	54.897342°N	1.994319°E
TA_CAM_22	09/06/2011	435527.5	6083825.8	54.897299°N	1.994671°E
TA_CAM_23	31/05/2011	439696.7	6067130.4	54.747803°N	2.063151°E
TA_CAM_23	31/05/2011	439685.2	6067130.0	54.747798°N	2.062972°E
TA_CAM_23	31/05/2011	439665.1	6067174.6	54.748196°N	2.062650°E
TA_CAM_23	31/05/2011	439672.5	6067141.7	54.747902°N	2.062772°E
TA_CAM_23	31/05/2011	439692.3	6067106.3	54.747586°N	2.063088°E
TA_CAM_23	31/05/2011	439704.9	6067134.9	54.747844°N	2.063277°E
TA_CAM_24	09/05/2011	436993.6	6064936.6	54.727759°N	2.021638°E
TA_CAM_24	09/05/2011	436989.6	6064942.5	54.727812°N	2.021574°E
TA_CAM_24	09/05/2011	436986.3	6064942.7	54.727813°N	2.021523°E
TA_CAM_25	09/05/2011	435505.2	6062748.2	54.707906°N	1.999015°E
TA_CAM_25	09/05/2011	435489.9	6062749.7	54.707918°N	1.998777°E
TA_CAM_25	09/05/2011	435481.5	6062719.3	54.707644°N	1.998653°E
TA_CAM_26	09/05/2011	433712.0	6061317.2	54.694815°N	1.971514°E
TA_CAM_26	09/05/2011	433722.3	6061278.9	54.694473°N	1.971681°E

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TA_CAM_26	09/05/2011	433719.5	6061250.5	54.694217°N	1.971645°E
TA_CAM_27	08/05/2011	430229.4	6066340.8	54.739483°N	1.916287°E
TA_CAM_27	08/05/2011	430234.3	6066345.1	54.739523°N	1.916362°E
TA_CAM_27	08/05/2011	430222.5	6066337.2	54.739450°N	1.916181°E
TA_CAM_28	10/06/2011	427147.0	6074786.3	54.814929°N	1.866300°E
TA_CAM_28	10/06/2011	427145.3	6074789.2	54.814954°N	1.866272°E
TA_CAM_28	10/06/2011	427148.7	6074793.1	54.814990°N	1.866324°E
TA_CAM_29	08/05/2011	434897.4	6066633.9	54.742743°N	1.988714°E
TA_CAM_29	08/05/2011	434917.9	6066642.5	54.742823°N	1.989031°E
TA_CAM_29	08/05/2011	434933.6	6066660.7	54.742988°N	1.989271°E
TA_CAM_30	19/05/2011	432018.7	6069326.3	54.766554°N	1.943375°E
TA_CAM_30	19/05/2011	432004.7	6069349.4	54.766760°N	1.943153°E
TA_CAM_30	19/05/2011	432016.3	6069312.8	54.766432°N	1.943342°E
TA_CAM_31	19/05/2011	429634.3	6071786.8	54.788334°N	1.905726°E
TA_CAM_31	19/05/2011	429628.5	6071798.3	54.788436°N	1.905633°E
TA_CAM_31	19/05/2011	429622.4	6071799.1	54.788442°N	1.905538°E
TA_CAM_32	19/05/2011	425856.2	6071112.8	54.781733°N	1.847157°E
TA_CAM_32	19/05/2011	425831.5	6071119.7	54.781792°N	1.846770°E
TA_CAM_32	19/05/2011	425827.2	6071118.0	54.781776°N	1.846705°E
TA_CAM_32_1	01/06/2011	425867.2	6071116.6	54.781769°N	1.847326°E
TA_CAM_32_1	01/06/2011	425875.7	6071128.2	54.781875°N	1.847456°E
TA_CAM_32_1	01/06/2011	425860.3	6071110.9	54.781717°N	1.847221°E
TA_CAM_33	08/05/2011	427951.9	6065725.6	54.733634°N	1.881071°E
TA_CAM_33	08/05/2011	427948.6	6065708.7	54.733482°N	1.881024°E
TA_CAM_33	08/05/2011	427958.5	6065715.2	54.733541°N	1.881176°E
TA_CAM_34	12/05/2011	430345.0	6060766.6	54.689414°N	1.919415°E
TA_CAM_34	12/05/2011	430332.6	6060751.8	54.689279°N	1.919226°E
TA_CAM_34	12/05/2011	430337.7	6060764.3	54.689392°N	1.919303°E
TA_CAM_35	08/05/2011	425263.7	6064241.1	54.719904°N	1.839713°E
TA_CAM_35	08/05/2011	425263.8	6064239.3	54.719888°N	1.839714°E
TA_CAM_35	08/05/2011	425265.9	6064234.9	54.719848°N	1.839748°E
TA_CAM_36	08/05/2011	419875.7	6065941.6	54.734353°N	1.755617°E
TA_CAM_36	08/05/2011	419886.4	6065941.8	54.734357°N	1.755783°E
TA_CAM_36	08/05/2011	419884.1	6065946.3	54.734396°N	1.755747°E
TA_CAM_36_1	08/05/2011	419859.6	6065952.7	54.734450°N	1.755364°E
TA_CAM_36_1	08/05/2011	419862.5	6065910.1	54.734068°N	1.755420°E
TA_CAM_36_1	08/05/2011	419890.1	6065931.6	54.734266°N	1.755843°E
TA_CAM_37	07/05/2011	414601.4	6068614.6	54.757500°N	1.672942°E
TA_CAM_37	07/05/2011	414603.9	6068623.3	54.757579°N	1.672978°E
TA_CAM_37	07/05/2011	414616.7	6068619.6	54.757548°N	1.673179°E
TA_CAM_38	14/06/2011	413260.8	6076663.0	54.829579°N	1.649708°E
TA_CAM_38	14/06/2011	413265.4	6076658.5	54.829539°N	1.649781°E
TA_CAM_38	14/06/2011	413254.5	6076666.8	54.829612°N	1.649609°E
TA_CAM_39	14/06/2011	416691.9	6075488.6	54.819610°N	1.703444°E
TA_CAM_39	14/06/2011	416688.2	6075495.0	54.819667°N	1.703385°E
TA_CAM_39	14/06/2011	416686.3	6075492.6	54.819646°N	1.703355°E
TA_CAM_40	07/05/2011	420750.9	6073407.2	54.801568°N	1.767168°E
TA_CAM_40	07/05/2011	420759.9	6073400.0	54.801505°N	1.767310°E
TA_CAM_40	07/05/2011	420772.1	6073400.8	54.801514°N	1.767499°E
TA_CAM_41	08/05/2011	423973.5	6067835.5	54.752005°N	1.818748°E
TA_CAM_41	08/05/2011	423965.7	6067815.1	54.751821°N	1.818632°E
TA_CAM_41	08/05/2011	423971.5	6067820.6	54.751872°N	1.818721°E
TA_CAM_42	07/05/2011	418106.7	6070512.1	54.775132°N	1.726862°E
TA_CAM_42	07/05/2011	418097.5	6070525.2	54.775248°N	1.726717°E
TA_CAM_42	07/05/2011	418093.8	6070496.4	54.774989°N	1.726666°E

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TA_CAM_43	06/06/2011	394114.3	6083249.5	54.885065°N	1.349360°E
TA_CAM_43	06/06/2011	394103.0	6083249.9	54.885067°N	1.349184°E
TA_CAM_43	06/06/2011	394114.7	6083256.4	54.885128°N	1.349364°E
TA_CAM_43	06/06/2011	394100.2	6083247.5	54.885044°N	1.349140°E
TA_CAM_44	06/06/2011	396489.3	6085545.3	54.906186°N	1.385542°E
TA_CAM_44	06/06/2011	396491.8	6085544.2	54.906176°N	1.385582°E
TA_CAM_44	06/06/2011	396494.7	6085542.9	54.906165°N	1.385628°E
TA_CAM_45	02/06/2011	396063.3	6092499.0	54.968562°N	1.376385°E
TA_CAM_45	02/06/2011	396059.1	6092502.0	54.968588°N	1.376319°E
TA_CAM_45	02/06/2011	396058.1	6092507.0	54.968633°N	1.376301°E
TA_CAM_46	02/06/2011	397685.7	6089717.9	54.943915°N	1.402709°E
TA_CAM_46	02/06/2011	397685.8	6089717.7	54.943913°N	1.402711°E
TA_CAM_46	02/06/2011	397674.3	6089712.8	54.943867°N	1.402534°E
TA_CAM_47	30/05/2011	433696.6	6097579.9	55.020640°N	1.962948°E
TA_CAM_47	30/05/2011	433699.1	6097579.5	55.020636°N	1.962987°E
TA_CAM_47	30/05/2011	433699.7	6097577.7	55.020620°N	1.962997°E
TA_CAM_48	30/05/2011	430643.0	6099846.5	55.040589°N	1.914645°E
TA_CAM_48	30/05/2011	430646.5	6099853.0	55.040647°N	1.914699°E
TA_CAM_48	30/05/2011	430652.7	6099871.6	55.040816°N	1.914791°E
TA_CAM_49	08/06/2011	427446.4	6102368.1	55.062788°N	1.863992°E
TA_CAM_49	08/06/2011	427451.6	6102360.4	55.062720°N	1.864075°E
TA_CAM_49	08/06/2011	427452.9	6102363.1	55.062743°N	1.864095°E
TA_CAM_50	08/06/2011	424257.0	6103748.5	55.074714°N	1.813699°E
TA_CAM_50	08/06/2011	424262.1	6103750.7	55.074735°N	1.813779°E
TA_CAM_50	08/06/2011	424260.7	6103749.7	55.074725°N	1.813757°E
TA_CAM_51	16/06/2011	420777.5	6104856.1	55.084122°N	1.758908°E
TA_CAM_51	16/06/2011	420776.7	6104851.2	55.084078°N	1.758897°E
TA_CAM_51	16/06/2011	420769.2	6104846.5	55.084034°N	1.758780°E
TA_CAM_52	16/06/2011	416986.4	6105057.9	55.085316°N	1.699475°E
TA_CAM_52	16/06/2011	416997.2	6105043.5	55.085188°N	1.699649°E
TA_CAM_52	16/06/2011	417009.9	6105049.7	55.085246°N	1.699846°E
TA_CAM_53	16/06/2011	413508.9	6105049.9	55.084649°N	1.645014°E
TA_CAM_53	16/06/2011	413509.1	6105044.4	55.084600°N	1.645019°E
TA_CAM_53	16/06/2011	413506.6	6105046.3	55.084617°N	1.644979°E
TA_CAM_54	11/05/2011	415501.4	6101742.1	55.055276°N	1.677200°E
TA_CAM_54	11/05/2011	415498.2	6101736.6	55.055225°N	1.677152°E
TA_CAM_54	11/05/2011	415514.2	6101792.1	55.055727°N	1.677385°E
TA_CAM_55	10/05/2011	418791.8	6097372.1	55.016563°N	1.729938°E
TA_CAM_55	10/05/2011	418790.7	6097372.5	55.016567°N	1.729921°E
TA_CAM_55	10/05/2011	418789.6	6097395.9	55.016777°N	1.729897°E
TA_CAM_56	10/05/2011	420979.2	6091404.5	54.963301°N	1.765787°E
TA_CAM_56	10/05/2011	420975.9	6091411.8	54.963366°N	1.765733°E
TA_CAM_56	10/05/2011	420974.9	6091409.9	54.963349°N	1.765717°E
TA_CAM_57	08/06/2011	424765.0	6100174.7	55.042683°N	1.822597°E
TA_CAM_57	08/06/2011	424762.6	6100170.6	55.042646°N	1.822560°E
TA_CAM_57	08/06/2011	424770.5	6100182.8	55.042756°N	1.822680°E
TA_CAM_58	10/05/2011	425366.9	6094189.2	54.988996°N	1.833575°E
TA_CAM_58	10/05/2011	425367.5	6094192.8	54.989029°N	1.833584°E
TA_CAM_58	10/05/2011	425353.3	6094198.3	54.989076°N	1.833360°E
TA_CAM_59	10/05/2011	427247.1	6090114.3	54.952663°N	1.863988°E
TA_CAM_59	10/05/2011	427243.6	6090111.0	54.952633°N	1.863934°E
TA_CAM_59	10/05/2011	427232.2	6090109.6	54.952618°N	1.863758°E
TA_CAM_59	10/05/2011	427214.6	6090111.7	54.952635°N	1.863482°E
TA_CAM_59	10/05/2011	427213.9	6090108.4	54.952605°N	1.863471°E
TA_CAM_60	11/05/2011	420571.4	6100189.5	55.042163°N	1.756981°E

Site	Date	UTM WGS84 Z31N		WGS84 (DD)	
		Eastings	Northings	Latitude	Longitude
TA_CAM_60	11/05/2011	420617.7	6100193.4	55.042206°N	1.757704°E
TA_CAM_60	11/05/2011	420596.0	6100188.0	55.042153°N	1.757366°E
TA_CAM_61	10/05/2011	431838.5	6092102.4	54.971175°N	1.935194°E
TA_CAM_61	10/05/2011	431814.4	6092098.1	54.971132°N	1.934819°E
TA_CAM_61	10/05/2011	431831.2	6092101.6	54.971166°N	1.935081°E
TA_CAM_62	01/06/2011	397386.0	6101165.2	55.046684°N	1.393931°E
TA_CAM_62	01/06/2011	397390.7	6101178.8	55.046806°N	1.393998°E
TA_CAM_62	01/06/2011	397390.6	6101162.4	55.046659°N	1.394003°E
TA_CAM_63	01/06/2011	400375.1	6101981.9	55.054628°N	1.440410°E
TA_CAM_63	01/06/2011	400394.2	6101976.2	55.054580°N	1.440710°E
TA_CAM_63	01/06/2011	400370.4	6101959.1	55.054421°N	1.440344°E
TA_CAM_64	17/06/2011	404279.9	6102832.3	55.063035°N	1.501228°E
TA_CAM_64	17/06/2011	404284.0	6102848.7	55.063183°N	1.501287°E
TA_CAM_64	17/06/2011	404270.0	6102858.8	55.063270°N	1.501065°E
TA_CAM_65	17/06/2011	407730.3	6103399.0	55.068778°N	1.555051°E
TA_CAM_65	17/06/2011	407736.5	6103389.5	55.068694°N	1.555151°E
TA_CAM_65	17/06/2011	407726.1	6103399.9	55.068786°N	1.554985°E
TA_CAM_65	17/06/2011	407719.4	6103402.1	55.068805°N	1.554879°E
TA_CAM_66	02/06/2011	400468.5	6089517.0	54.942673°N	1.446205°E
TA_CAM_66	02/06/2011	400461.5	6089512.5	54.942631°N	1.446097°E
TA_CAM_66	02/06/2011	400482.1	6089499.5	54.942519°N	1.446423°E
TA_CAM_67	07/06/2011	404432.1	6088033.8	54.930123°N	1.508551°E
TA_CAM_67	07/06/2011	404425.9	6088043.7	54.930211°N	1.508451°E
TA_CAM_67	07/06/2011	404446.5	6088024.9	54.930046°N	1.508777°E
TA_CAM_68	15/06/2011	409523.9	6087821.8	54.929167°N	1.588053°E
TA_CAM_68	15/06/2011	409522.1	6087841.5	54.929344°N	1.588019°E
TA_CAM_68	15/06/2011	409532.0	6087835.5	54.929292°N	1.588175°E
TA_CAM_69	09/05/2011	413410.1	6085837.7	54.912031°N	1.649278°E
TA_CAM_69	09/05/2011	413411.9	6085841.4	54.912065°N	1.649305°E
TA_CAM_69	09/05/2011	413437.7	6085848.9	54.912137°N	1.649706°E
TA_CAM_69	09/05/2011	413415.2	6085835.6	54.912014°N	1.649359°E
TA_CAM_69	09/05/2011	413409.3	6085845.7	54.912103°N	1.649263°E
TA_CAM_69	09/05/2011	413422.4	6085829.9	54.911964°N	1.649473°E
TA_CAM_70	14/06/2011	419876.9	6083667.1	54.893609°N	1.750730°E
TA_CAM_70	14/06/2011	419872.4	6083662.8	54.893569°N	1.750661°E
TA_CAM_70	14/06/2011	419873.6	6083653.6	54.893487°N	1.750683°E
TA_CAM_71	25/06/2011	410728.4	6095280.3	54.996390°N	1.604523°E
TA_CAM_71	25/06/2011	410719.0	6095295.3	54.996523°N	1.604372°E
TA_CAM_71	25/06/2011	410752.0	6095287.7	54.996461°N	1.604889°E
TA_CAM_72	01/06/2011	400861.0	6098086.6	55.019733°N	1.449364°E
TA_CAM_72	01/06/2011	400865.6	6098088.6	55.019752°N	1.449436°E
TA_CAM_72	01/06/2011	400860.6	6098082.8	55.019699°N	1.449361°E
TA_CAM_73	01/06/2011	405483.9	6093624.4	54.980547°N	1.523118°E
TA_CAM_73	01/06/2011	405488.2	6093623.8	54.980542°N	1.523186°E
TA_CAM_73	01/06/2011	405479.4	6093626.9	54.980569°N	1.523047°E
TA_CAM_74	15/06/2011	407737.6	6084145.9	54.895818°N	1.561365°E
TA_CAM_74	15/06/2011	407734.2	6084144.8	54.895807°N	1.561312°E
TA_CAM_74	15/06/2011	407731.0	6084151.9	54.895870°N	1.561260°E
TA_CAM_75	15/06/2011	403555.4	6082769.2	54.882660°N	1.496638°E
TA_CAM_75	15/06/2011	403559.8	6082752.7	54.882513°N	1.496712°E
TA_CAM_75	15/06/2011	403555.7	6082756.8	54.882549°N	1.496646°E
TA_CAM_76	07/05/2011	419595.3	6064450.6	54.720912°N	1.751675°E
TA_CAM_76	07/05/2011	419590.6	6064456.6	54.720965°N	1.751600°E
TA_CAM_76	07/05/2011	419584.9	6064430.2	54.720727°N	1.751519°E
TA_CAM_77	02/06/2011	400073.2	6093209.6	54.975765°N	1.438751°E

Site	Date	UTM WGS84 Z31N		WGS84 (DD)	
		Eastings	Northings	Latitude	Longitude
TA_CAM_77	02/06/2011	400077.2	6093211.4	54.975782°N	1.438812°E
TA_CAM_77	02/06/2011	400078.5	6093207.5	54.975747°N	1.438834°E
TA_CAM_78	01/06/2011	402238.7	6095709.8	54.998654°N	1.471718°E
TA_CAM_78	01/06/2011	402243.2	6095711.8	54.998673°N	1.471788°E
TA_CAM_78	01/06/2011	402249.2	6095710.7	54.998665°N	1.471882°E
TA_CAM_79	01/06/2011	404457.4	6097989.9	55.019568°N	1.505627°E
TA_CAM_79	01/06/2011	404446.6	6097988.0	55.019549°N	1.505458°E
TA_CAM_79	01/06/2011	404443.4	6097981.3	55.019488°N	1.505411°E
TA_CAM_80	10/06/2011	429738.1	6080364.3	54.865417°N	1.905257°E
TA_CAM_80	10/06/2011	429746.0	6080355.5	54.865339°N	1.905382°E
TA_CAM_80	10/06/2011	429734.0	6080357.1	54.865352°N	1.905195°E
TA_CAM_81	29/05/2011	439394.0	6089127.0	54.945416°N	2.053835°E
TA_CAM_81	29/05/2011	439393.5	6089126.3	54.945409°N	2.053827°E
TA_CAM_81	29/05/2011	439387.9	6089124.9	54.945396°N	2.053740°E
TA_CAM_82	14/06/2011	416692.6	6079567.3	54.856255°N	1.702279°E
TA_CAM_82	14/06/2011	416691.6	6079567.4	54.856255°N	1.702264°E
TA_CAM_82	14/06/2011	416687.3	6079568.7	54.856266°N	1.702196°E
TA_CAM_83	19/05/2011	431337.6	6073327.9	54.802417°N	1.931844°E
TA_CAM_83	19/05/2011	431321.8	6073291.8	54.802090°N	1.931607°E
TA_CAM_83	19/05/2011	431322.1	6073297.0	54.802137°N	1.931610°E
TA_CAM_84	30/05/2011	430856.0	6103147.6	55.070278°N	1.917178°E
TA_CAM_84	30/05/2011	430839.1	6103173.5	55.070508°N	1.916907°E
TA_CAM_84	30/05/2011	430835.2	6103169.0	55.070467°N	1.916847°E
TA_CAM_85	25/05/2011	457285.4	6083856.3	54.899906°N	2.333909°E
TA_CAM_85	25/05/2011	457311.5	6083843.6	54.899794°N	2.334317°E
TA_CAM_85	25/05/2011	457291.7	6083860.6	54.899945°N	2.334006°E
TA_CAM_86	15/06/2011	415300.0	6091917.9	54.966981°N	1.676957°E
TA_CAM_86	15/06/2011	415303.1	6091916.2	54.966966°N	1.677007°E
TA_CAM_86	16/06/2011	415308.5	6091914.2	54.966949°N	1.677091°E
TA_CAM_87	07/06/2011	394807.3	6090529.2	54.950604°N	1.357497°E
TA_CAM_87	07/06/2011	394863.8	6090533.3	54.950652°N	1.358377°E
TA_CAM_87	07/06/2011	394840.6	6090544.1	54.950745°N	1.358010°E
TA_CAM_88	06/06/2011	393773.8	6083895.3	54.890794°N	1.343817°E
TA_CAM_88	06/06/2011	393772.8	6083898.3	54.890821°N	1.343800°E
TA_CAM_88	06/06/2011	393771.3	6083893.1	54.890774°N	1.343779°E
TA_CAM_89	06/06/2011	394925.4	6081941.9	54.873490°N	1.362475°E
TA_CAM_89	06/06/2011	394928.6	6081944.0	54.873509°N	1.362523°E
TA_CAM_89	06/06/2011	394917.5	6081943.2	54.873501°N	1.362351°E
TA_CAM_90	25/06/2011	398032.6	6105962.9	55.089913°N	1.402330°E
TA_CAM_90	25/06/2011	398037.0	6105958.7	55.089876°N	1.402399°E
TA_CAM_90	25/06/2011	398043.8	6105943.0	55.089737°N	1.402513°E
TA_CAM_91	25/06/2011	401097.3	6105973.3	55.090627°N	1.450325°E
TA_CAM_91	25/06/2011	401093.2	6106002.4	55.090887°N	1.450252°E
TA_CAM_91	25/06/2011	401069.1	6105977.0	55.090654°N	1.449883°E
TA_CAM_91	25/06/2011	401066.5	6105980.3	55.090683°N	1.449840°E
TA_CAM_91	25/06/2011	401077.1	6105965.6	55.090553°N	1.450011°E
TA_CAM_92	25/06/2011	402159.3	6104130.7	55.074285°N	1.467592°E
TA_CAM_92	25/06/2011	402161.6	6104119.0	55.074180°N	1.467632°E
TA_CAM_92	25/06/2011	402163.8	6104127.5	55.074257°N	1.467664°E
TA_CAM_93	11/05/2011	407414.0	6105409.1	55.086777°N	1.549447°E
TA_CAM_93	11/05/2011	407433.7	6105406.1	55.086753°N	1.549757°E
TA_CAM_93	11/05/2011	407451.5	6105425.3	55.086929°N	1.550028°E
TA_CAM_94	25/06/2011	411215.4	6097950.5	55.020466°N	1.611304°E
TA_CAM_94	25/06/2011	411259.9	6097955.1	55.020515°N	1.611999°E
TA_CAM_94	25/06/2011	411286.5	6097947.0	55.020447°N	1.612417°E

Site	Date	UTM WGS84 Z31N		WGS84 (DD)	
		Eastings	Northings	Latitude	Longitude
TA_CAM_95	25/06/2011	409297.2	6097099.1	55.012471°N	1.581581°E
TA_CAM_95	25/06/2011	409293.0	6097101.9	55.012496°N	1.581516°E
TA_CAM_95	25/06/2011	409293.5	6097107.8	55.012549°N	1.581521°E
TA_CAM_95	25/06/2011	409290.8	6097104.7	55.012520°N	1.581480°E
TA_CAM_96	09/05/2011	414763.1	6086056.7	54.914232°N	1.670313°E
TA_CAM_96	09/05/2011	414770.8	6086042.7	54.914108°N	1.670436°E
TA_CAM_96	09/05/2011	414757.1	6086051.0	54.914179°N	1.670220°E
TA_CAM_97	15/06/2011	404193.9	6086002.4	54.911828°N	1.505512°E
TA_CAM_97	15/06/2011	404203.5	6086006.3	54.911866°N	1.505659°E
TA_CAM_97	15/06/2011	404193.1	6086007.8	54.911877°N	1.505497°E
TA_CAM_98	16/06/2011	414325.7	6105919.4	55.092603°N	1.657545°E
TA_CAM_98	16/06/2011	414318.5	6105926.8	55.092667°N	1.657430°E
TA_CAM_98	16/06/2011	414325.2	6105923.2	55.092636°N	1.657536°E
TA_CAM_99	11/05/2011	419510.1	6101509.0	55.053847°N	1.740003°E
TA_CAM_99	11/05/2011	419515.4	6101467.0	55.053471°N	1.740099°E
TA_CAM_99	11/05/2011	419532.0	6101526.4	55.054007°N	1.740341°E
TA_CAM_100	10/05/2011	422280.9	6091753.0	54.966637°N	1.786018°E
TA_CAM_100	10/05/2011	422280.0	6091744.3	54.966558°N	1.786006°E
TA_CAM_100	10/05/2011	422283.0	6091755.5	54.966659°N	1.786050°E
TA_CAM_101	10/06/2011	429499.5	6083812.0	54.896360°N	1.900696°E
TA_CAM_101	10/06/2011	429492.2	6083818.1	54.896415°N	1.900581°E
TA_CAM_101	10/06/2011	429487.8	6083832.3	54.896541°N	1.900510°E
TA_CAM_102	30/05/2011	441133.4	6095855.0	55.006077°N	2.079604°E
TA_CAM_102	31/05/2011	441146.8	6095850.4	55.006037°N	2.079815°E
TA_CAM_102	31/05/2011	441091.0	6095831.9	55.005865°N	2.078945°E
TA_CAM_103	06/06/2011	436249.9	6085909.5	54.916114°N	2.005471°E
TA_CAM_103	06/06/2011	436251.4	6085912.5	54.916141°N	2.005494°E
TA_CAM_103	06/06/2011	436252.3	6085938.7	54.916377°N	2.005503°E
TA_CAM_104	29/05/2011	446300.6	6089088.8	54.945863°N	2.161653°E
TA_CAM_104	29/05/2011	446320.8	6089089.4	54.945871°N	2.161968°E
TA_CAM_104	29/05/2011	446307.7	6089094.3	54.945914°N	2.161761°E
TA_CAM_105	08/05/2011	426422.8	6063959.8	54.717547°N	1.857776°E
TA_CAM_105	08/05/2011	426422.6	6063954.6	54.717500°N	1.857774°E
TA_CAM_105	08/05/2011	426429.5	6063947.7	54.717439°N	1.857883°E
TA_CAM_106	07/05/2011	415014.4	6071995.3	54.787944°N	1.678368°E
TA_CAM_106	07/05/2011	414992.5	6072039.5	54.788337°N	1.678015°E
TA_CAM_106	07/05/2011	415016.8	6072013.0	54.788103°N	1.678400°E

APPENDIX III HYPERDIGITAL VIDEO LOG (NEARSHORE SITES)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

Site	Date	Start Time (GMT)	Actual Start Depth (m BSL)	WGS84 UTM Z31N				WGS84 (DD)			
				Start Position		End Position		Start Position		End Position	
				Eastings	Northings	Eastings	Northings	Latitude	Longitude	Latitude	Longitude
NS01	20/11/2011	10:30	55.1	318513.0	6002609.0	318510.0	6002658.0	54.139491°N	0.221664°E	54.139930°N	0.221588°E
NS02	20/11/2011	10:55	57.4	318435.0	6000502.0	318455.0	6000521.0	54.120548°N	0.221738°E	54.120726°N	0.222032°E
NS03	20/11/2011	10:05	58.0	317749.0	6003255.0	317727.0	6003313.0	54.145020°N	0.209593°E	54.145532°N	0.209222°E
NS04	20/11/2011	09:34	55.5	317030.0	6003913.0	317005.0	6003953.0	54.150671°N	0.198200°E	54.151021°N	0.197793°E
NS05	20/11/2011	09:05	53.4	316704.0	6004405.0	316675.0	6004391.0	54.154971°N	0.192916°E	54.154835°N	0.192481°E
NS06	20/11/2011	08:35	55.2	316078.0	6003234.0	316034.0	6003242.0	54.144236°N	0.184056°E	54.144292°N	0.183378°E
NS07	19/11/2011	15:31	54.0	315627.0	6002239.0	315648.0	6002207.0	54.135142°N	0.177768°E	54.134863°N	0.178108°E
NS08	19/11/2011	15:07	51.4	315236.0	6002735.0	315250.0	6002680.0	54.139454°N	0.171487°E	54.138966°N	0.171735°E
NS09	19/11/2011	12:36	53.0	314852.0	5998089.0	314846.0	5998148.0	54.097610°N	0.168463°E	54.098138°N	0.168335°E
NS10	19/11/2011	13:10	55.3	314082.0	5999549.0	314051.0	5999598.0	54.110439°N	0.155805°E	54.110867°N	0.155302°E
NS11	19/11/2011	13:39	55.0	313841.0	5999948.0	313833.0	5999946.0	54.113933°N	0.151878°E	54.113912°N	0.151757°E
NS12	19/11/2011	14:07	54.1	313114.0	6000667.0	313126.0	6000615.0	54.120124°N	0.140326°E	54.119661°N	0.140541°E
NS13	19/11/2011	14:35	54.6	312215.0	6002686.0	312243.0	6002644.0	54.137920°N	0.125333°E	54.137553°N	0.125787°E
NS14	19/11/2011	12:02	53.4	311605.0	5998970.0	311567.0	5999015.0	54.104340°N	0.118325°E	54.104731°N	0.117717°E
NS15	19/11/2011	11:34	51.2	309911.0	5994561.0	309900.0	5994621.0	54.064141°N	0.095218°E	54.064676°N	0.095013°E
NS16	19/11/2011	10:56	51.4	309417.0	5998110.0	309412.0	5998170.0	54.095816°N	0.085447°E	54.096352°N	0.085333°E
NS17	19/11/2011	10:23	53.2	308957.0	6000445.0	308951.0	6000510.0	54.116604°N	0.076947°E	54.117185°N	0.076815°E
NS18	19/11/2011	09:28	48.7	306957.0	5997001.0	306956.0	5997059.0	54.084945°N	0.048589°E	54.085465°N	0.048536°E
NS19	19/11/2011	09:53	49.2	306285.0	5998068.0	306267.0	5998123.0	54.094270°N	0.037647°E	54.094757°N	0.037337°E
NS20	19/11/2011	08:44	40.9	305737.0	5994628.0	305741.0	5994663.0	54.063187°N	0.031485°E	54.063502°N	0.031524°E
NS21	19/11/2011	09:01	41.2	305535.0	5995307.0	305556.0	5995321.0	54.069205°N	0.027967°E	54.069339°N	0.028279°E
NS22	19/11/2011	08:08	32.7	303934.0	5993610.0	303928.0	5993608.0	54.053367°N	0.004633°E	54.053347°N	0.004543°E
NS23	17/11/2011	15:17	31.3	303825.2	5993904.2	303844.4	5993971.9	54.055966°N	0.002783°E	54.056581°N	0.003032°E
NS24	17/11/2011	14:57	30.3	303824.5	5994337.9	303851.2	5994413.1	54.059859°N	0.002492°E	54.060544°N	0.002851°E
NS25	17/11/2011	13:10	22.3	301808.2	5990382.5	301799.3	5990458.5	54.023587°N	0.025688°W	54.024265°N	0.025873°W
NS26	17/11/2011	13:51	26.5	301368.8	5996146.2	301332.1	5996217.8	54.075148°N	0.036158°W	54.075777°N	0.036765°W
NS27	17/11/2011	14:26	26.9	301355.0	5993431.7	301369.4	5993527.5	54.050780°N	0.034590°W	54.051645°N	0.034433°W
NS28	17/11/2011	12:38	23.4	300783.8	5992344.1	300826.3	5992421.1	54.040798°N	0.042589°W	54.041505°N	0.041991°W
NS29	17/11/2011	12:06	19.6	298934.1	5993090.6	298940.4	5993180.3	54.046780°N	0.071288°W	54.047588°N	0.071252°W
NS30	17/11/2011	11:28	12.0	293035.0	5990783.5	293000.1	5990848.1	54.023743°N	0.159676°W	54.024308°N	0.160252°W
NS31	17/11/2011	09:55	14.0	291317.5	5990261.3	291361.6	5989270.6	54.018365°N	0.185494°W	54.009492°N	0.184142°W
NS32	17/11/2011	10:31	12.3	290565.6	5989107.3	290578.3	5989124.8	54.007705°N	0.196157°W	54.007867°N	0.195976°W
NS33	17/11/2011	08:59	10.5	290259.3	5990942.5	290263.1	5990972.4	54.024049°N	0.202089°W	54.024319°N	0.202052°W
NS34	17/11/2011	08:36	6.4	289752.2	5990578.5	289738.1	5990464.2	54.020577°N	0.209566°W	54.019545°N	0.209702°W
NS34 (Repeat)	17/11/2011	11:04	-	-	-	-	-	-	-	-	-

APPENDIX III STATIC IMAGES (NEARSHORE SITES)

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

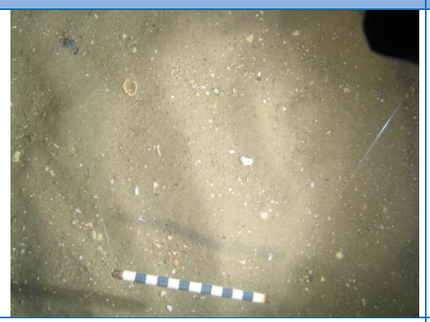
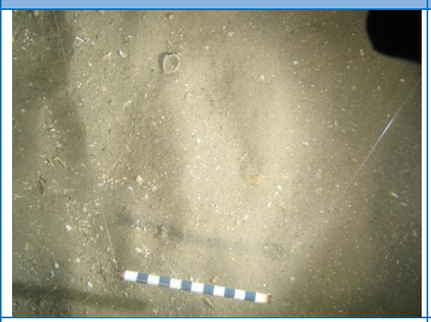
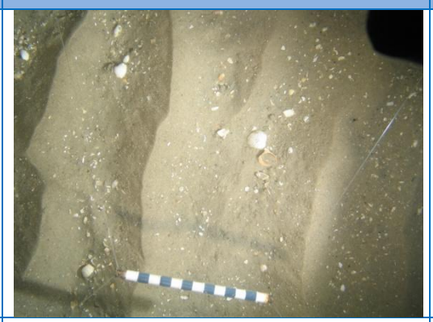
Site	Date	UTM WGS84 Z31N		WGS84 (DD)	
		Eastings	Northings	Latitude	Longitude
NS01	20/11/2011	318510.0	6002612.0	54.139517°N	0.221616°E
NS01	20/11/2011	318503.0	6002633.0	54.139703°N	0.221496°E
NS01	20/11/2011	318502.0	6002650.0	54.139855°N	0.221471°E
NS02	20/11/2011	318433.0	6000506.0	54.120584°N	0.221705°E
NS02	20/11/2011	318421.0	6000547.0	54.120947°N	0.221497°E
NS02	20/11/2011	318455.0	6000521.0	54.120726°N	0.222032°E
NS03	20/11/2011	317742.0	6003262.0	54.145080°N	0.209482°E
NS03	20/11/2011	317729.0	6003289.0	54.145318°N	0.209267°E
NS03	20/11/2011	317727.0	6003295.0	54.145371°N	0.209233°E
NS04	20/11/2011	317023.0	6003912.0	54.150659°N	0.198094°E
NS04	20/11/2011	317012.0	6003921.0	54.150736°N	0.197920°E
NS04	20/11/2011	317006.0	6003941.0	54.150914°N	0.197816°E
NS05	20/11/2011	316689.0	6004387.0	54.154804°N	0.192697°E
NS05	20/11/2011	316689.0	6004378.0	54.154724°N	0.192703°E
NS05	20/11/2011	316667.0	6004386.0	54.154788°N	0.192361°E
NS06	20/11/2011	316063.0	6003250.0	54.144374°N	0.183816°E
NS06	20/11/2011	316046.0	6003255.0	54.144413°N	0.183553°E
NS06	20/11/2011	316038.0	6003242.0	54.144293°N	0.183439°E
NS07	20/11/2011	315625.0	6002216.0	54.134935°N	0.177751°E
NS07	20/11/2011	315642.0	6002210.0	54.134887°N	0.178015°E
NS07	20/11/2011	315638.0	6002204.0	54.134832°N	0.177957°E
NS08	19/11/2011	315241.0	6002694.0	54.139088°N	0.171588°E
NS08	19/11/2011	315249.0	6002692.0	54.139073°N	0.171712°E
NS08	19/11/2011	315627.0	6002239.0	54.135142°N	0.177768°E
NS09	19/11/2011	314837.0	5998134.0	54.098009°N	0.168206°E
NS09	19/11/2011	314854.0	5998118.0	54.097871°N	0.168475°E
NS09	19/11/2011	314866.0	5998146.0	54.098127°N	0.168642°E
NS10	19/11/2011	314082.0	5999549.0	54.110439°N	0.155805°E
NS10	19/11/2011	314075.0	5999611.0	54.110993°N	0.155660°E
NS10	19/11/2011	314051.0	5999598.0	54.110867°N	0.155302°E
NS11	19/11/2011	313845.0	5999938.0	54.113845°N	0.151945°E
NS11	19/11/2011	313846.0	5999913.0	54.113621°N	0.151976°E
NS11	19/11/2011	313833.0	5999946.0	54.113912°N	0.151757°E
NS12	19/11/2011	313119.0	6000655.0	54.120018°N	0.140410°E
NS12	19/11/2011	313117.0	6000648.0	54.119954°N	0.140383°E
NS12	19/11/2011	313119.0	6000630.0	54.119794°N	0.140425°E
NS13	19/11/2011	312216.0	6002659.0	54.137678°N	0.125365°E
NS13	19/11/2011	312231.0	6002646.0	54.137567°N	0.125603°E
NS13	19/11/2011	312243.0	6002644.0	54.137553°N	0.125787°E
NS14	19/11/2011	311603.0	5998980.0	54.104430°N	0.118288°E
NS14	19/11/2011	311589.0	5998993.0	54.104541°N	0.118066°E
NS14	19/11/2011	311572.0	5999001.0	54.104607°N	0.117802°E
NS15	19/11/2011	309900.0	5994599.0	54.064479°N	0.095026°E
NS15	19/11/2011	309898.0	5994606.0	54.064541°N	0.094991°E
NS15	19/11/2011	309900.0	5994621.0	54.064676°N	0.095013°E
NS16	19/11/2011	309409.0	5998130.0	54.095992°N	0.085312°E
NS16	19/11/2011	309408.0	5998156.0	54.096225°N	0.085281°E
NS16	19/11/2011	309412.0	5998170.0	54.096352°N	0.085333°E
NS17	19/11/2011	308950.0	6000451.0	54.116655°N	0.076837°E
NS17	19/11/2011	308951.0	6000488.0	54.116988°N	0.076829°E
NS17	19/11/2011	308949.0	6000500.0	54.117095°N	0.076790°E
NS18	19/11/2011	306953.0	5997008.0	54.085006°N	0.048523°E

Site	Date	UTM WGS84 Z31N		WGS84 (DD)	
		Eastings	Northings	Latitude	Longitude
NS18	19/11/2011	306951.0	5997016.0	54.085077°N	0.048487°E
NS18	19/11/2011	306951.0	5997053.0	54.085409°N	0.048464°E
NS19	19/11/2011	306270.0	5998088.0	54.094444°N	0.037405°E
NS19	19/11/2011	306274.0	5998106.0	54.094607°N	0.037455°E
NS19	19/11/2011	306272.0	5998112.0	54.094660°N	0.037420°E
NS20	19/11/2011	305720.0	5994648.0	54.063360°N	0.031213°E
NS20	19/11/2011	305743.0	5994649.0	54.063377°N	0.031563°E
NS20	19/11/2011	305757.0	5994662.0	54.063499°N	0.031768°E
NS21	19/11/2011	305538.0	5995303.0	54.069170°N	0.028016°E
NS21	19/11/2011	305527.0	5995329.0	54.069400°N	0.027831°E
NS21	19/11/2011	305534.0	5995327.0	54.069384°N	0.027939°E
NS22	19/11/2011	303942.0	5993632.0	54.053567°N	0.004741°E
NS22	19/11/2011	303946.0	5993644.0	54.053677°N	0.004794°E
NS22	19/11/2011	303943.0	5993627.0	54.053523°N	0.004759°E
NS23	17/11/2011	303878.2	5993984.6	54.056708°N	0.003540°E
NS23	17/11/2011	303849.3	5993949.1	54.056378°N	0.003122°E
NS23	17/11/2011	303843.2	5993969.0	54.056555°N	0.003016°E
NS24	17/11/2011	303821.8	5994344.0	54.059912°N	0.002447°E
NS24	17/11/2011	303835.1	5994363.1	54.060089°N	0.002637°E
NS24	17/11/2011	303846.3	5994401.6	54.060439°N	0.002783°E
NS25	17/11/2011	301812.8	5990403.1	54.023773°N	0.025631°W
NS25	17/11/2011	301826.5	5990421.2	54.023941°N	0.025434°W
NS25	17/11/2011	301799.3	5990458.5	54.024265°N	0.025873°W
NS26	17/11/2011	301322.2	5996185.8	54.075486°N	0.036895°W
NS26	17/11/2011	301327.4	5996204.2	54.075653°N	0.036827°W
NS26	17/11/2011	301332.1	5996217.8	54.075777°N	0.036765°W
NS27	17/11/2011	301374.2	5993468.5	54.051117°N	0.034321°W
NS27	17/11/2011	301394.7	5993483.5	54.051260°N	0.034018°W
NS27	17/11/2011	301352.7	5993515.6	54.051532°N	0.034680°W
NS28	17/11/2011	300790.9	5992358.7	54.040932°N	0.042490°W
NS28	17/11/2011	300810.1	5992372.9	54.041067°N	0.042206°W
NS28	17/11/2011	300818.3	5992399.0	54.041304°N	0.042098°W
NS29	17/11/2011	298939.2	5993108.7	54.046945°N	0.071223°W
NS29	17/11/2011	298957.9	5993138.5	54.047224°N	0.070956°W
NS29	17/11/2011	298899.4	5993106.2	54.046905°N	0.071834°W
NS30	17/11/2011	293035.0	5990783.5	54.023743°N	0.159676°W
NS30	17/11/2011	292989.2	5990805.6	54.023923°N	0.160389°W
NS30	17/11/2011	292997.4	5990833.8	54.024179°N	0.160284°W
NS31	17/11/2011	291317.5	5990261.3	54.018365°N	0.185494°W
NS31	17/11/2011	291369.4	5989292.7	54.009694°N	0.184039°W
NS31	17/11/2011	291361.6	5989270.6	54.009492°N	0.184142°W
NS32	17/11/2011	290562.6	5989093.9	54.007583°N	0.196194°W
NS32	17/11/2011	290575.4	5989114.4	54.007772°N	0.196013°W
NS32	17/11/2011	290582.2	5989113.5	54.007767°N	0.195909°W
NS33	17/11/2011	290257.0	5990975.9	54.024348°N	0.202147°W
NS33	17/11/2011	290260.2	5990976.1	54.024351°N	0.202099°W
NS33	17/11/2011	290263.1	5990972.4	54.024319°N	0.202052°W

APPENDIX IV Seabed images

APPENDIX IV TRANCHE A SEABED IMAGES

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Station ID					
TA_CAM_01					
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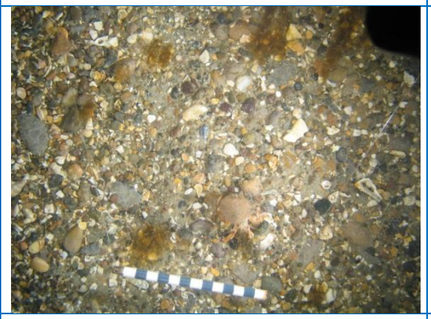
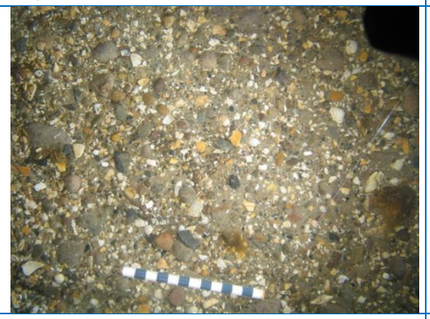
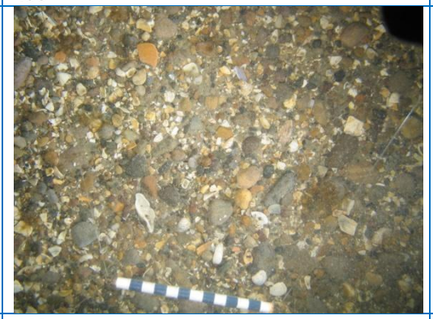
TA_CAM_02					
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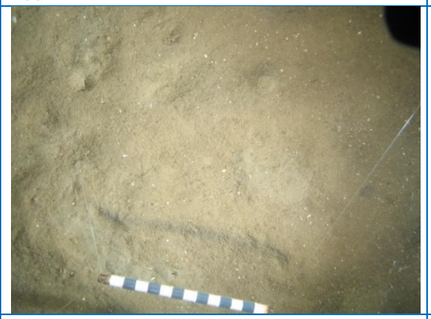
TA_CAM_03					
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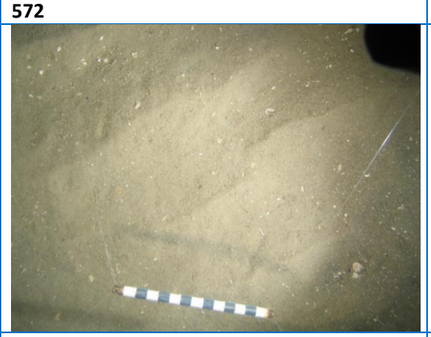
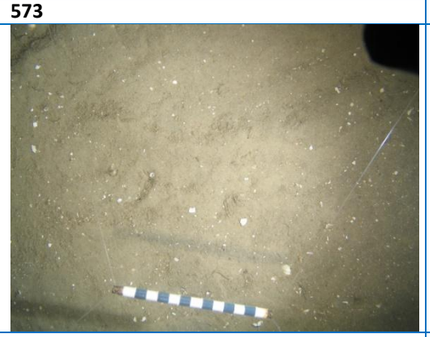
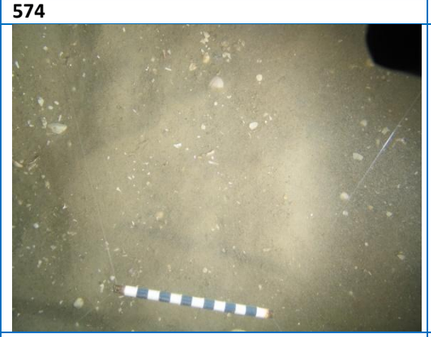
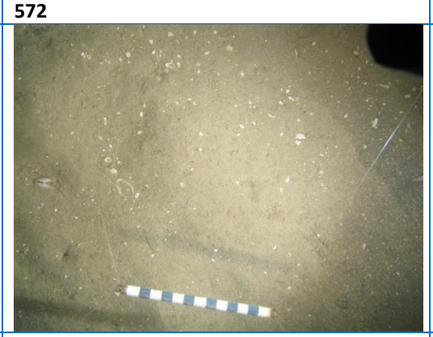
TA_CAM_04					
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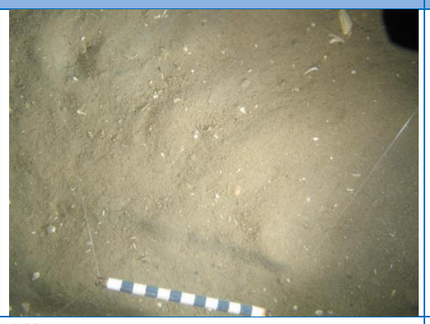
Station ID					
TA_CAM_05					
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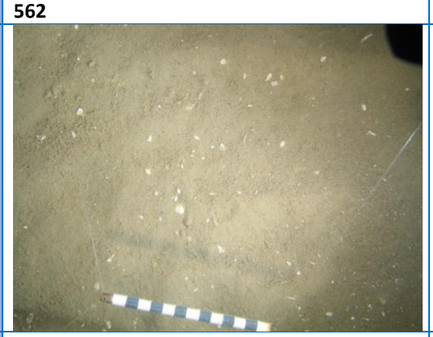
TA_CAM_06					
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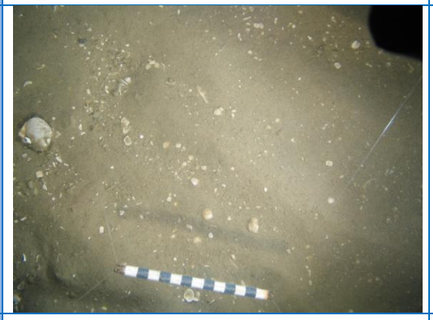
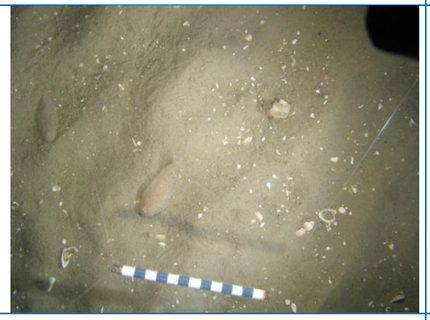
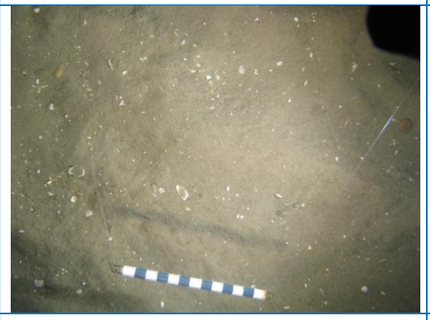
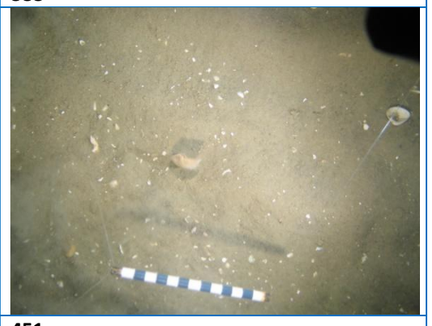
TA_CAM_07					
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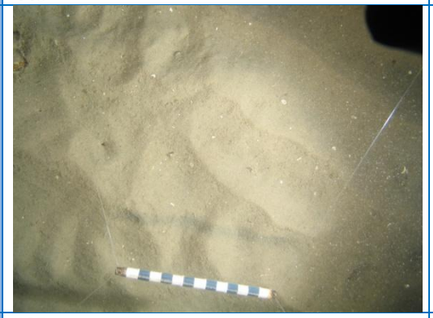
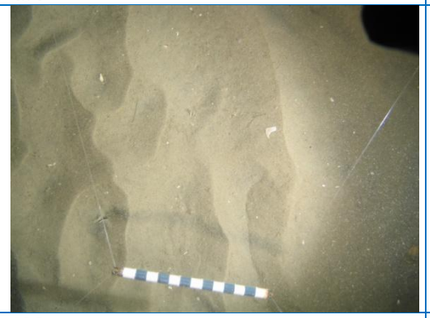
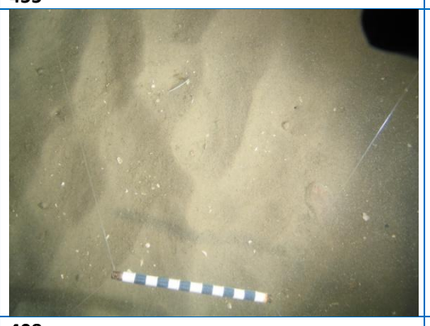
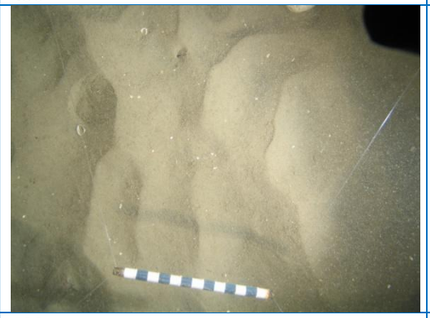
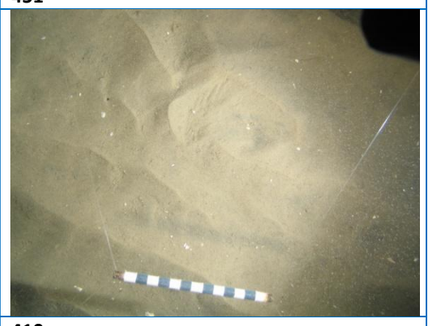
TA_CAM_08					
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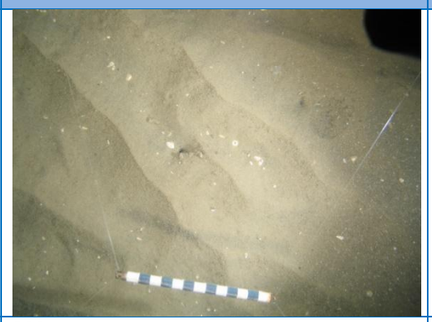
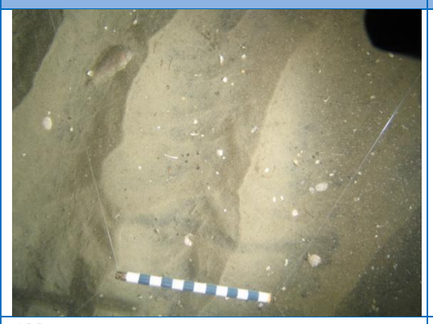
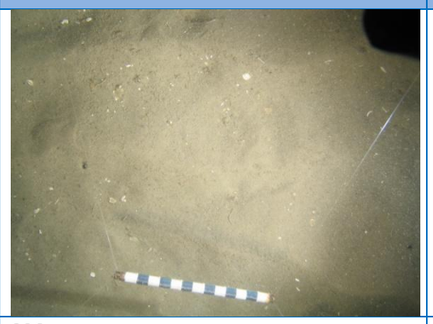
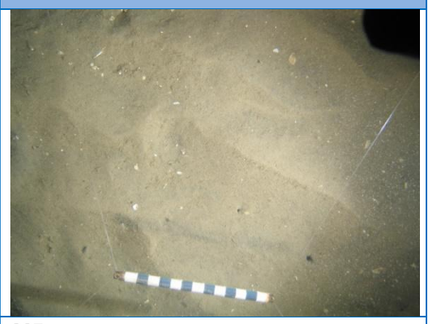
Station ID					
TA_CAM_09					
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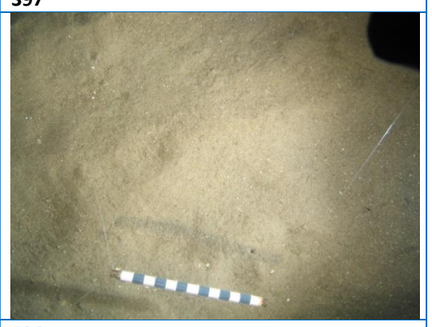
TA_CAM_10					
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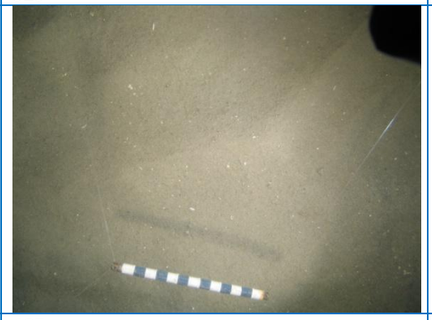
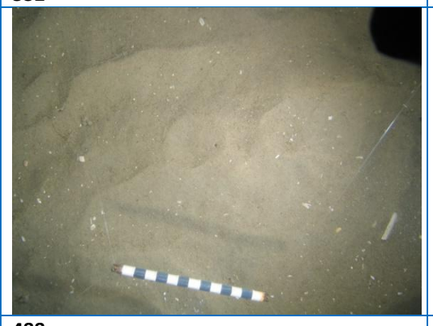
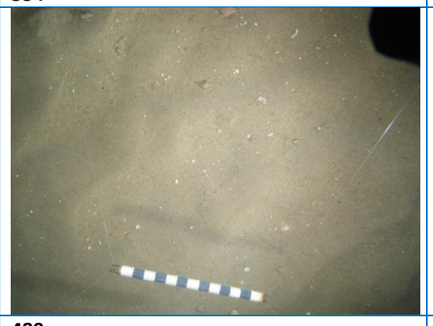
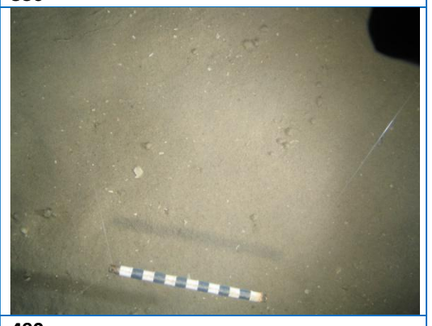
TA_CAM_11					
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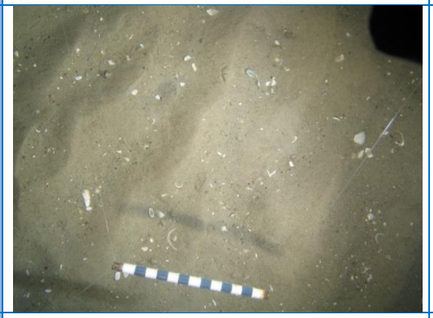
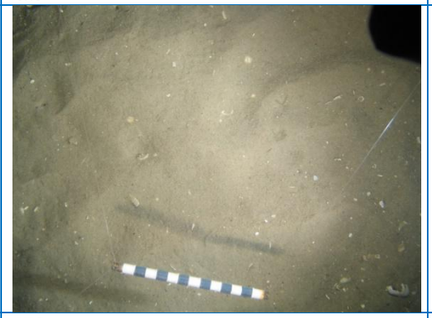
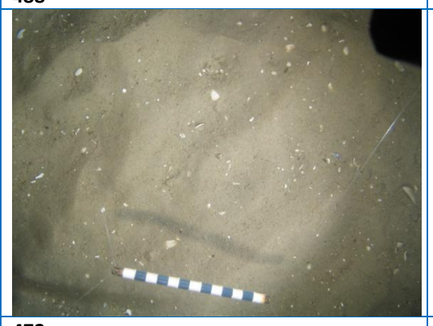
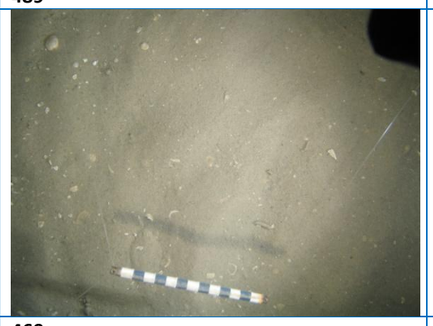
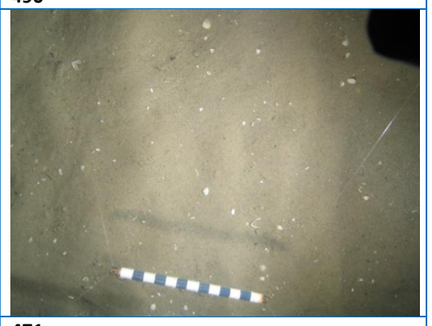
TA_CAM_12					
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Station ID					
TA_CAM_13					
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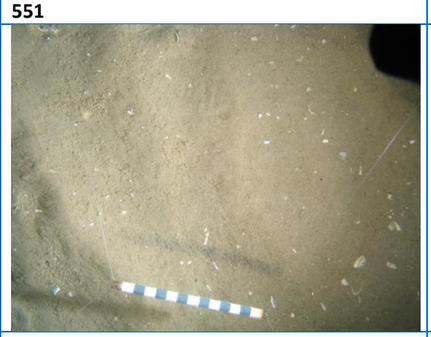
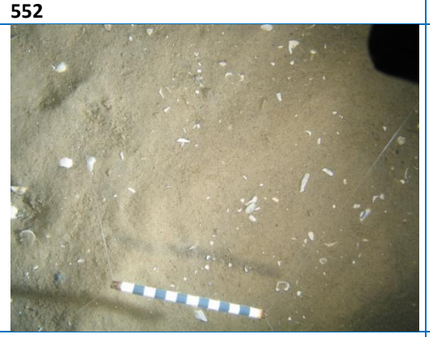
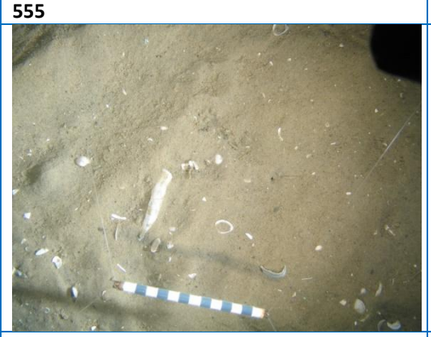
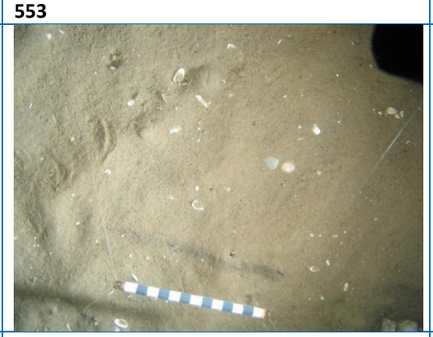
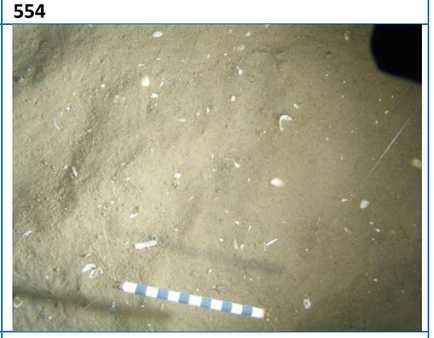
TA_CAM_14					
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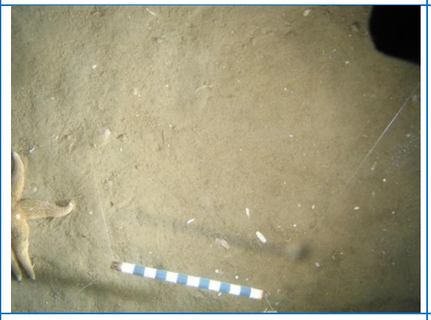
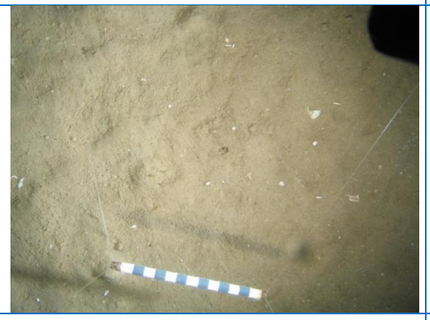
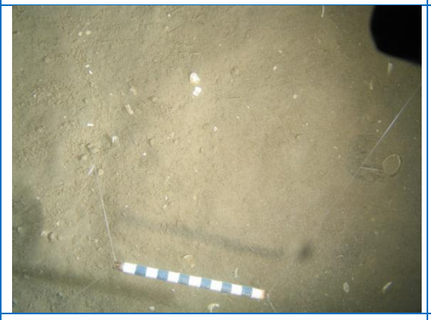
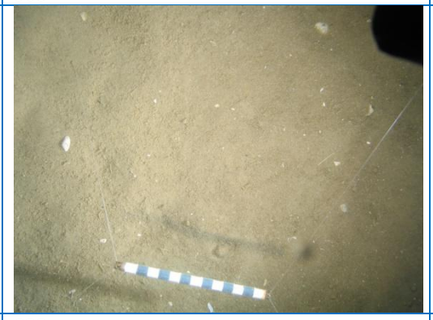
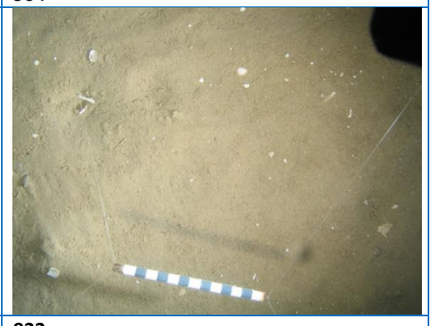
TA_CAM_15					
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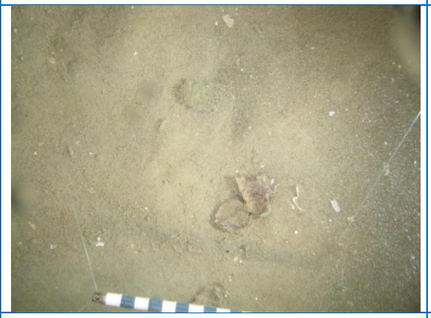
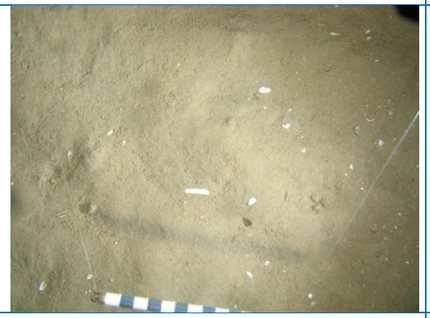
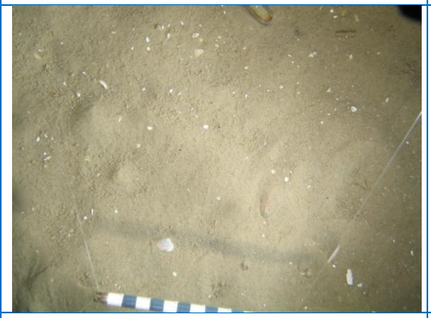
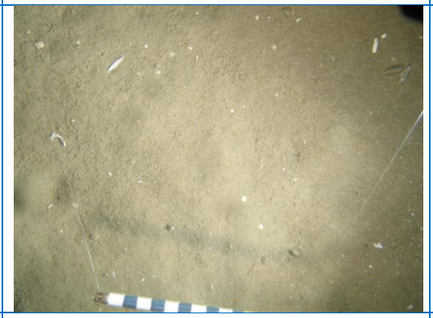
TA_CAM_16					
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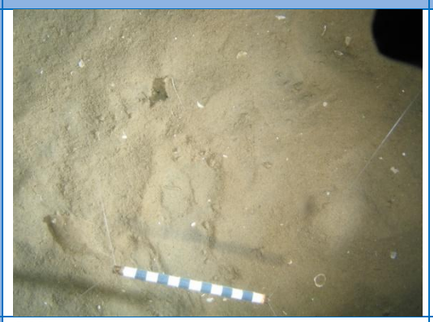
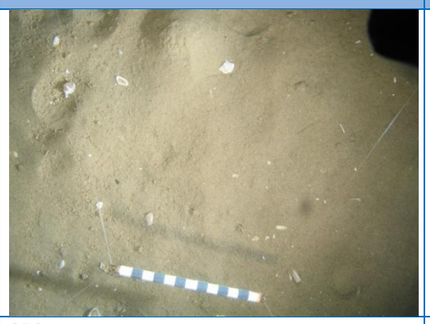
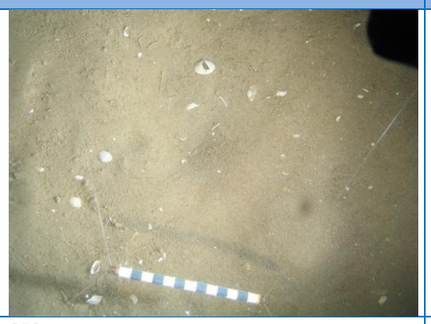
Station ID					
TA_CAM_17					
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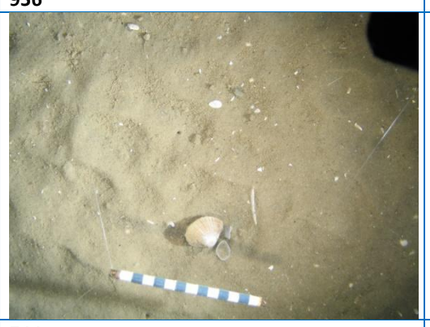
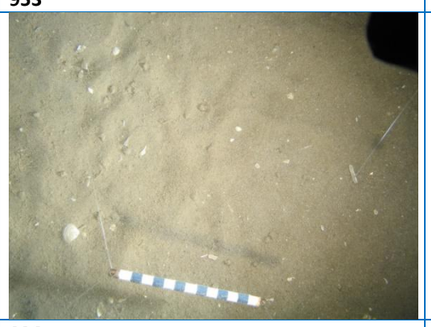
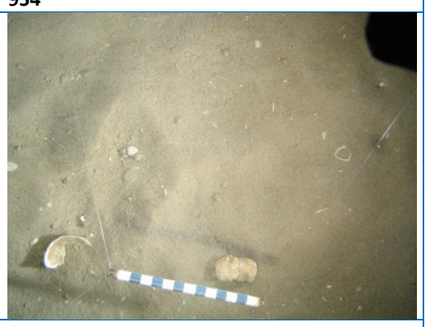
TA_CAM_18					
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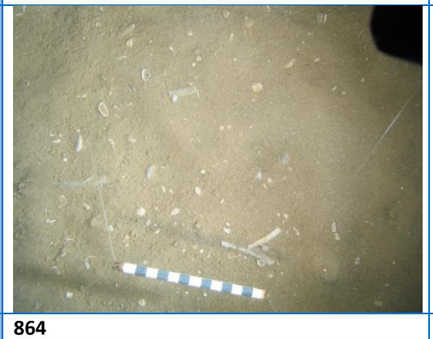
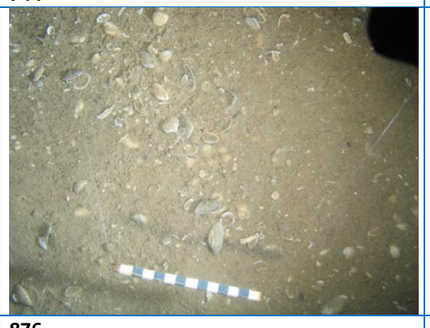
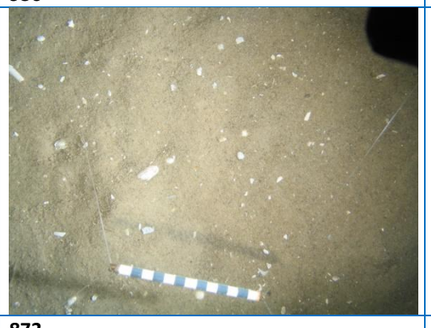
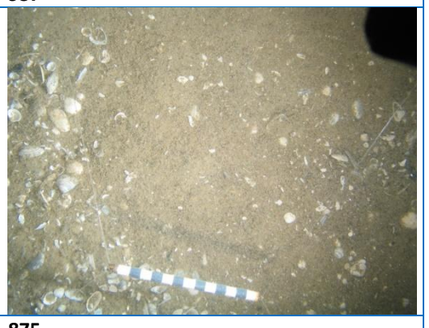
TA_CAM_19					
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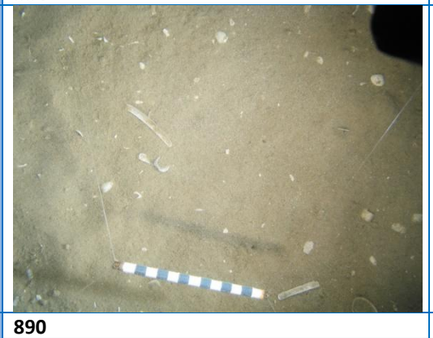
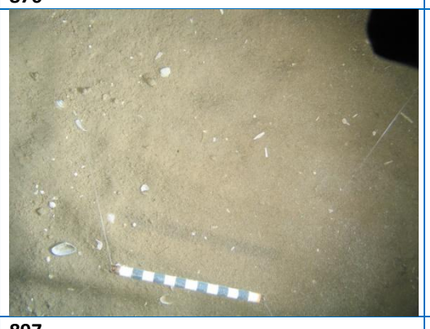
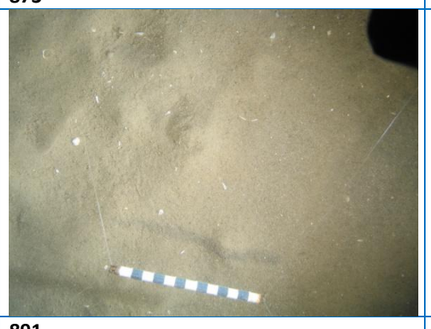
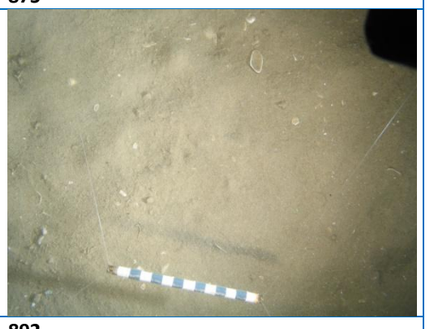
TA_CAM_20					
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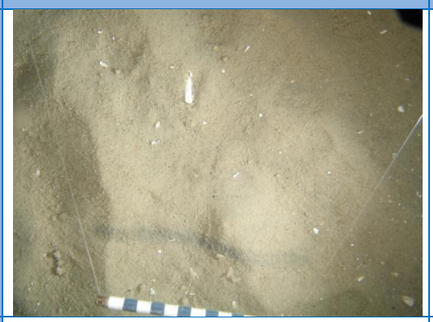
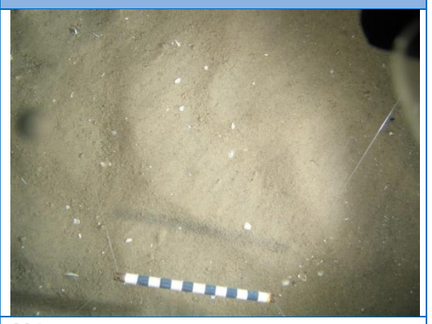
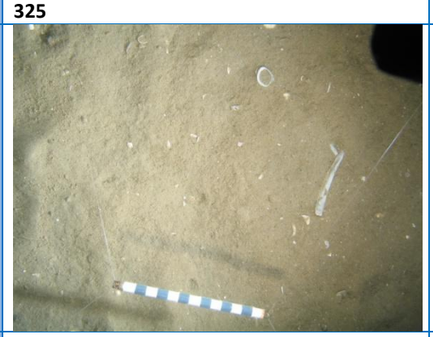
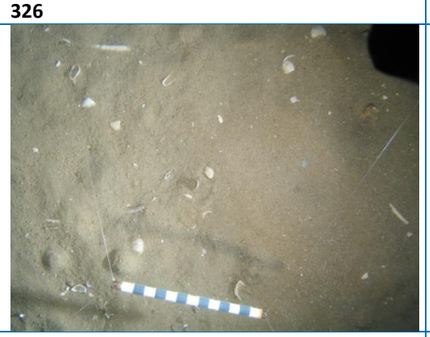
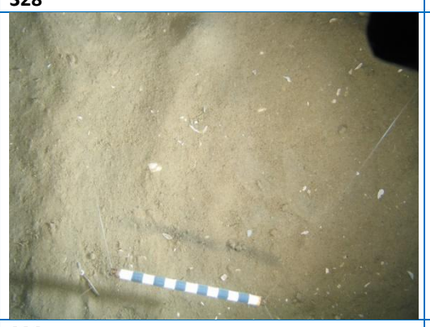
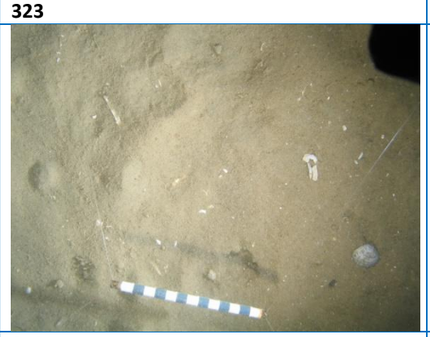
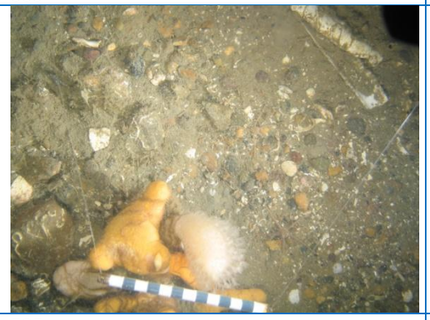
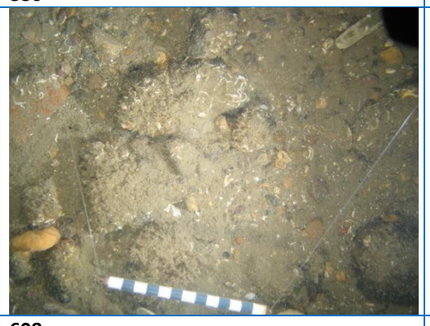
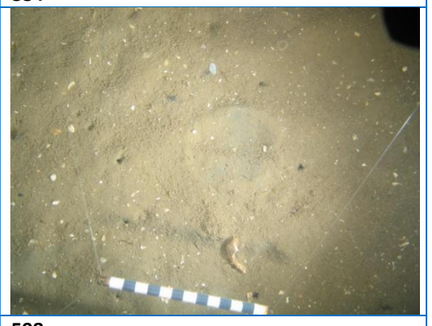
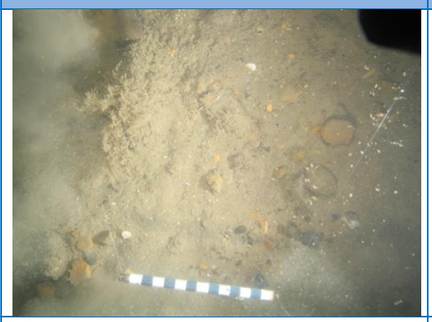
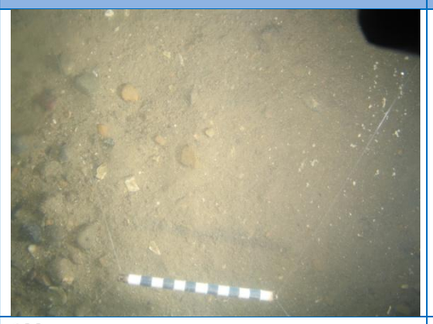
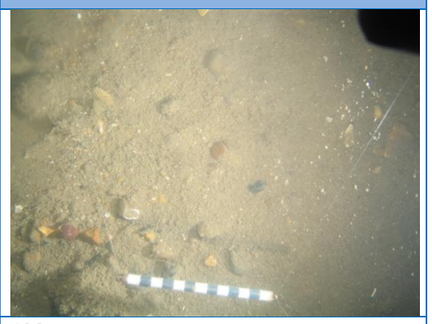
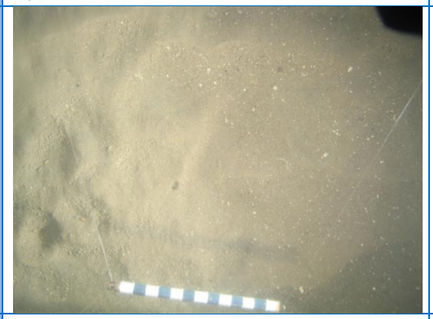
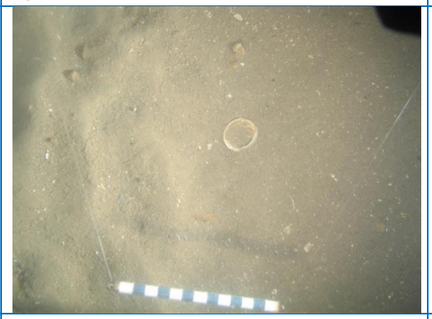
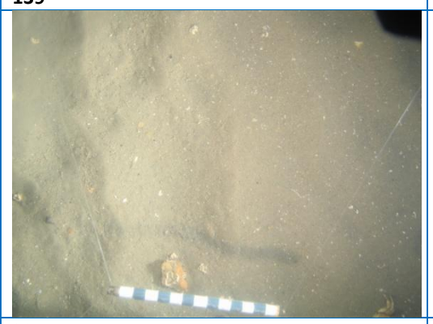
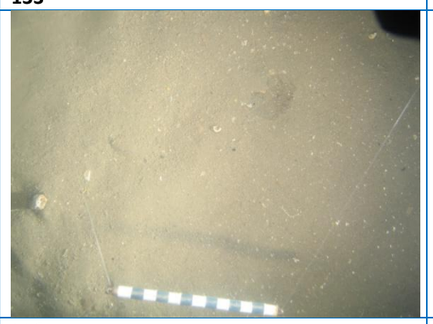
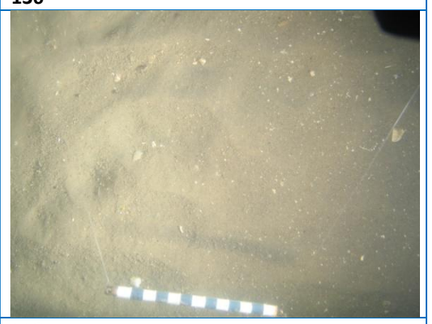
Station ID					
TA_CAM_21					
	325	326	328	323	324
TA_CAM_22					
	877	883	886	878	884
TA_CAM_23					
	593	595	608	612	598
					
	605				

Station ID					
TA_CAM_24					
	132	134	139	133	136
TA_CAM_25					
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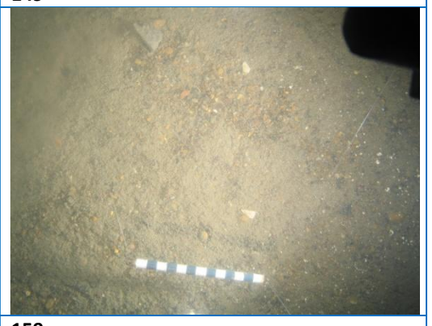
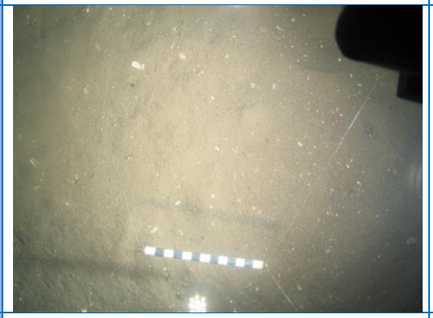
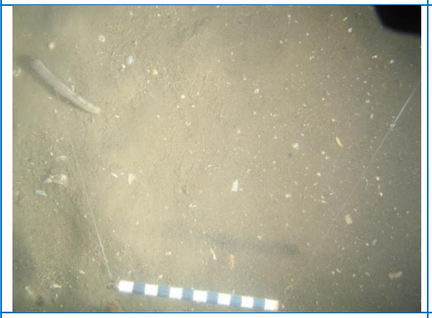
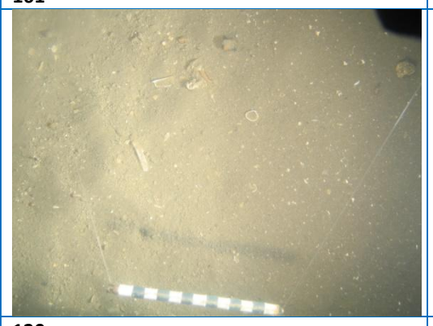
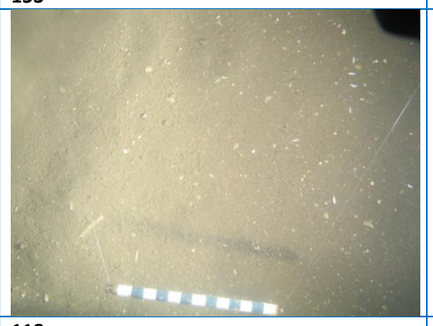
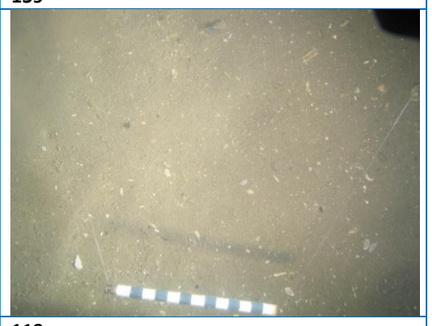
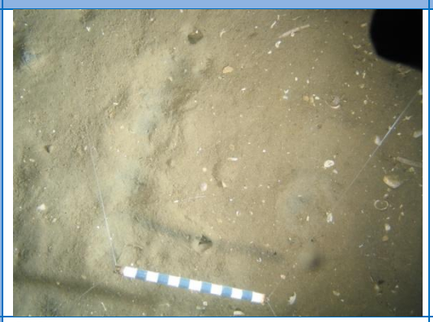
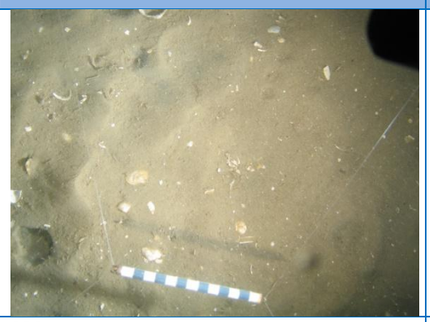
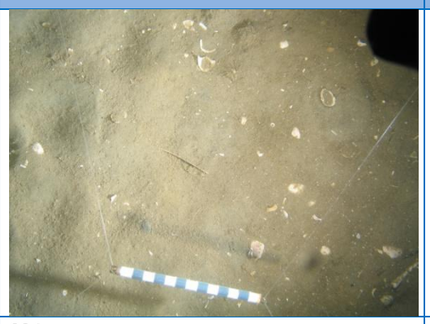
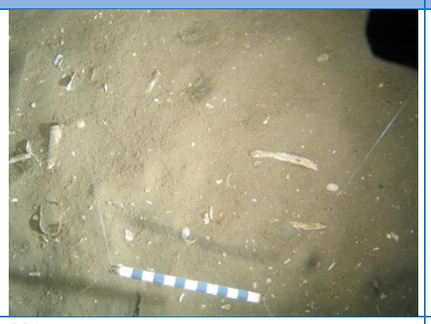
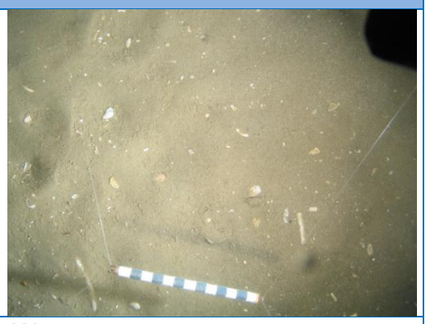
TA_CAM_26					
	154	158	161	153	159
TA_CAM_27					
	115	117	120	118	119

Station ID					
TA_CAM_28					
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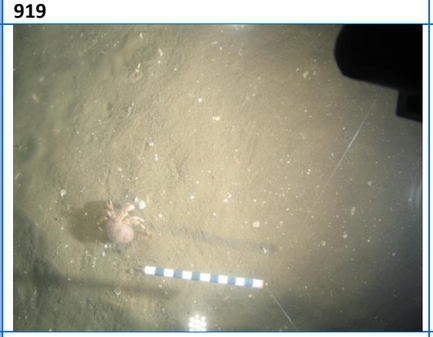
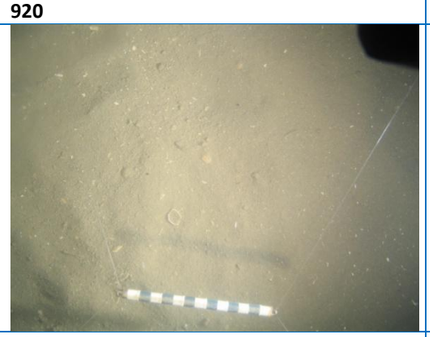
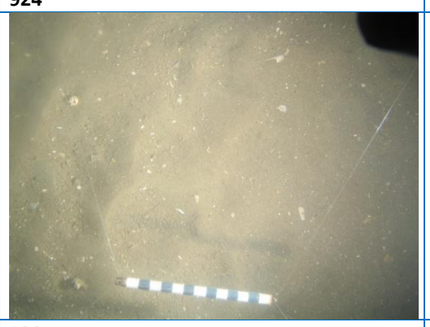
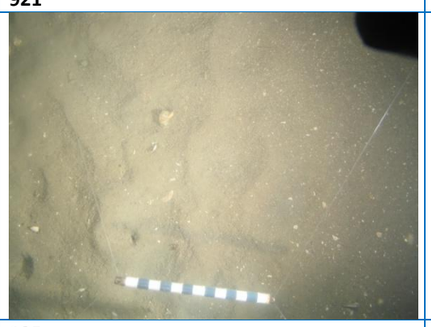
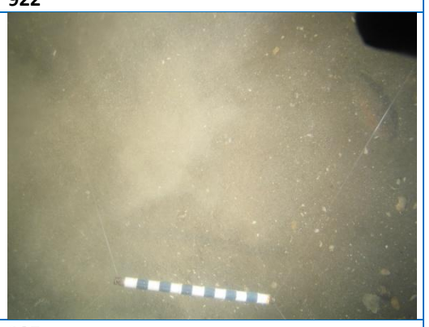
TA_CAM_29					
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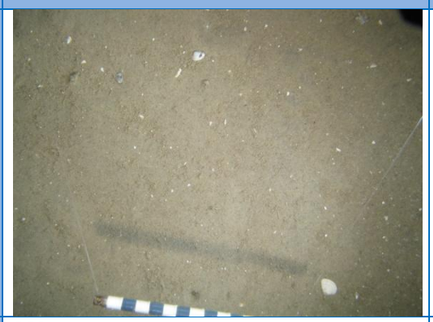
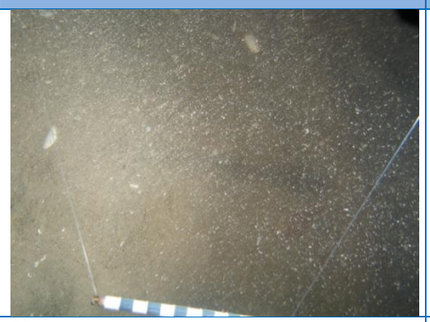
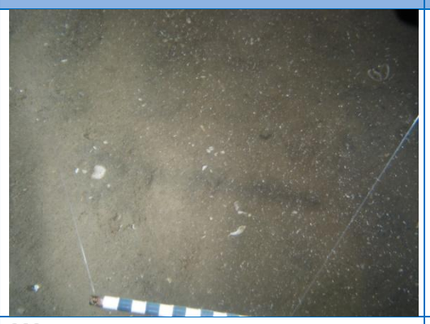
TA_CAM_30					
	356	361	364	361	362
TA_CAM_31					
	370	376	379	371	375

Station ID					
TA_CAM_32					
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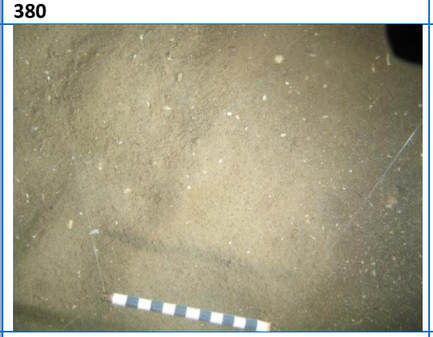
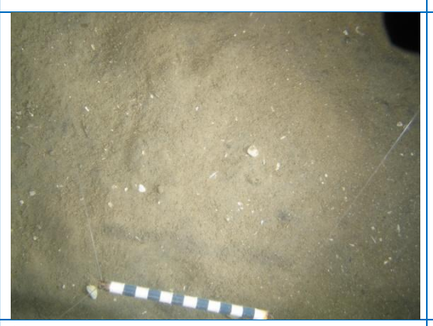
TA_CAM_32_1					
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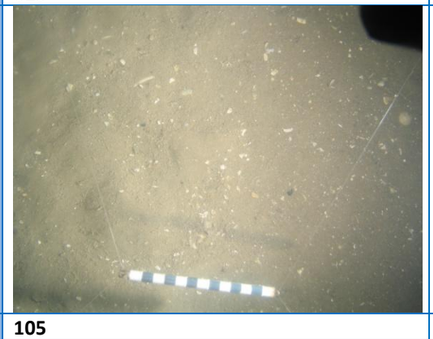
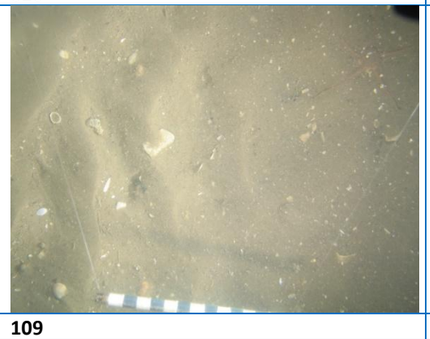
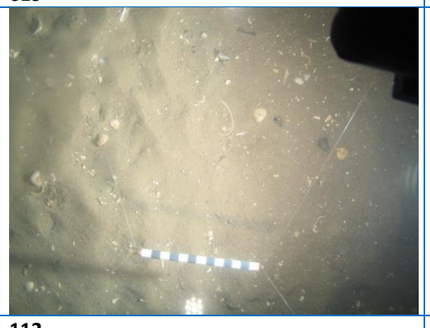
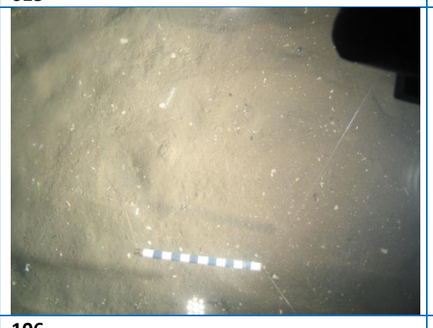
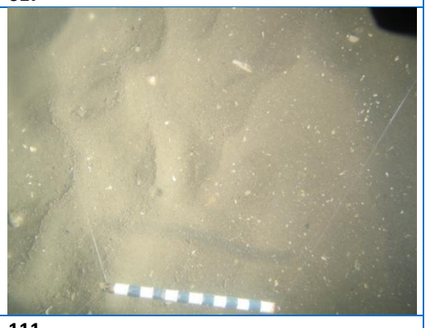
TA_CAM_33					
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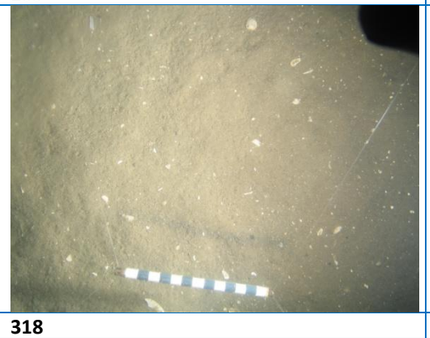
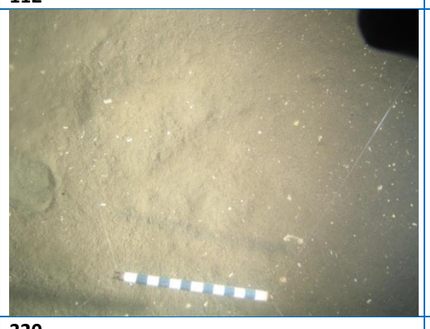
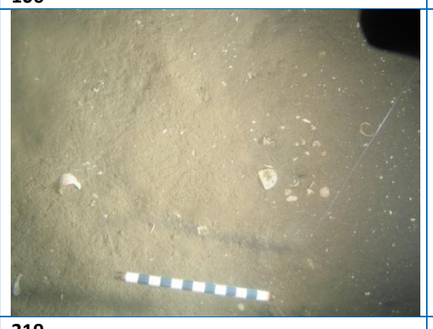
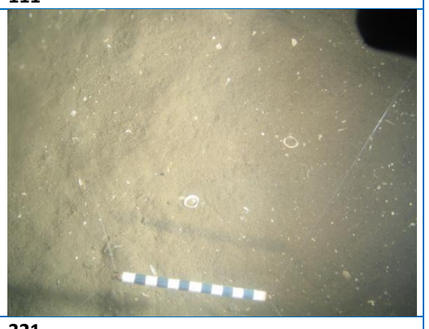
TA_CAM_34					
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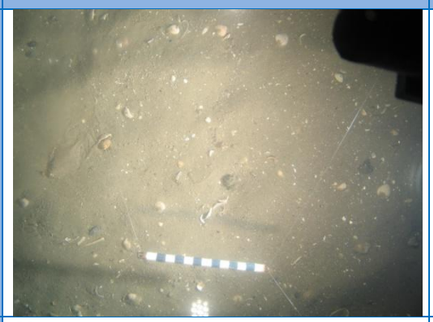
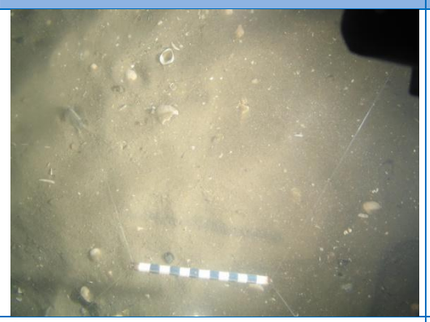
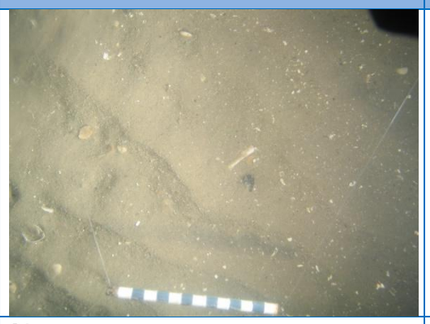
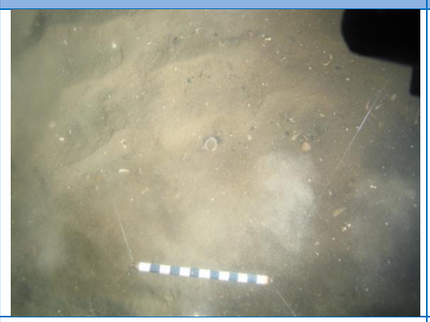
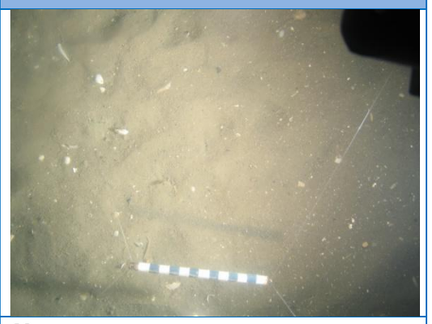
Station ID					
TA_CAM_35					
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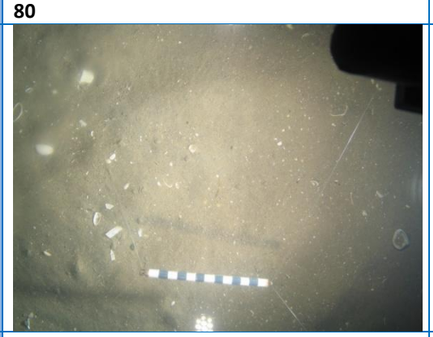
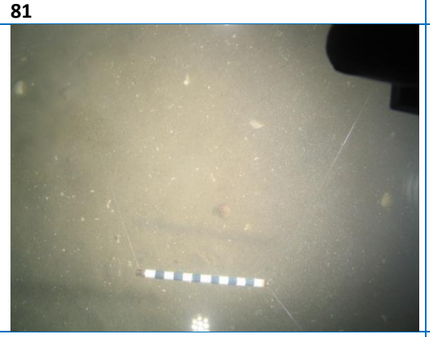
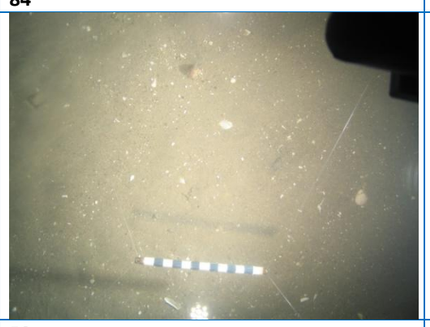
TA_CAM_36					
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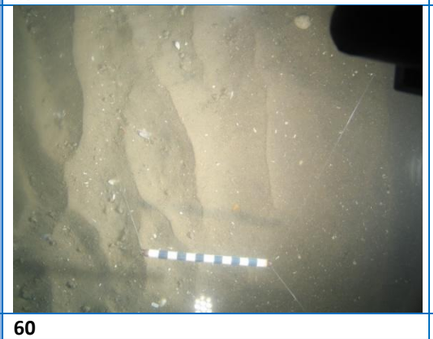
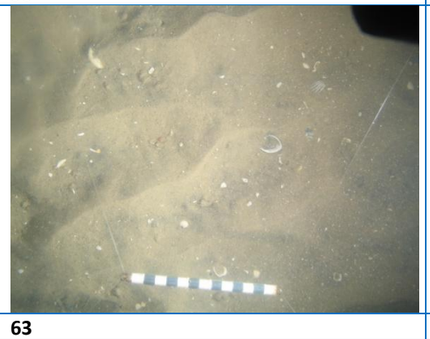
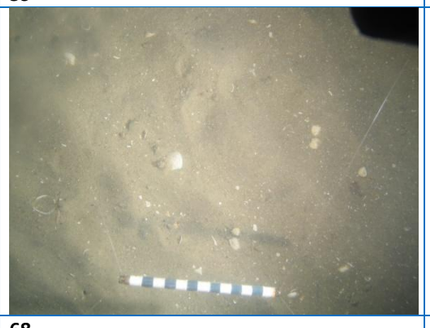
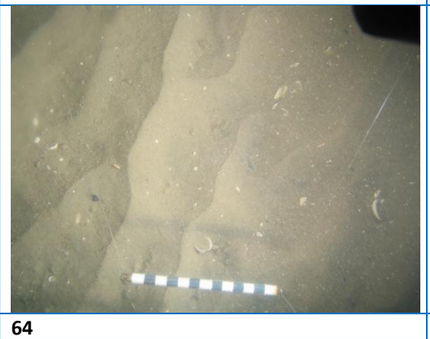
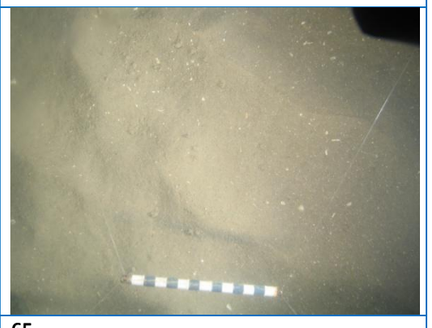
TA_CAM_36_1					
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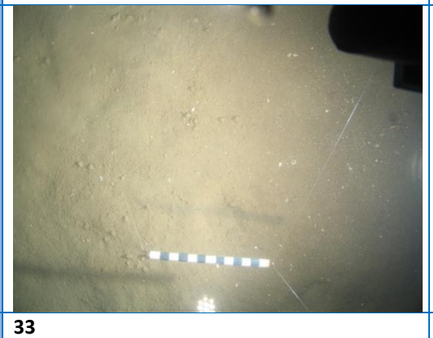
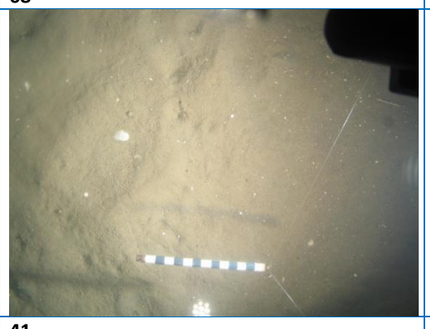
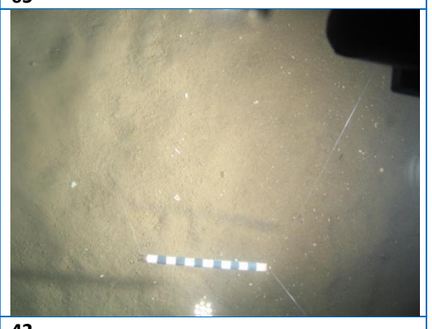
TA_CAM_37					
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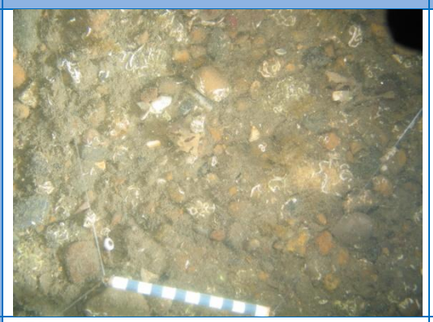
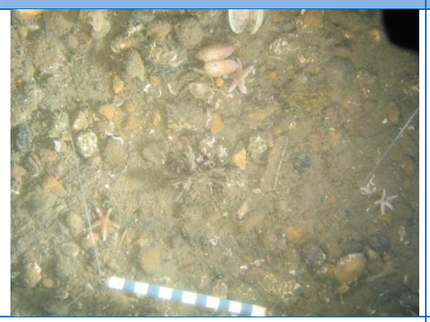
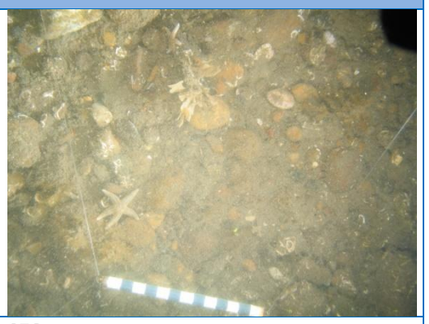
Station ID					
TA_CAM_38					
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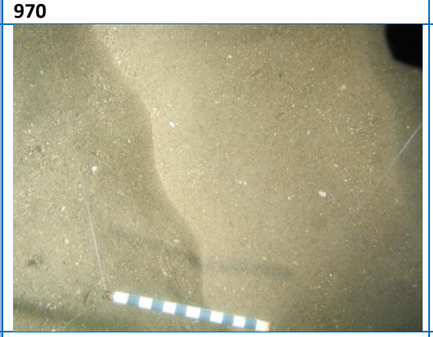
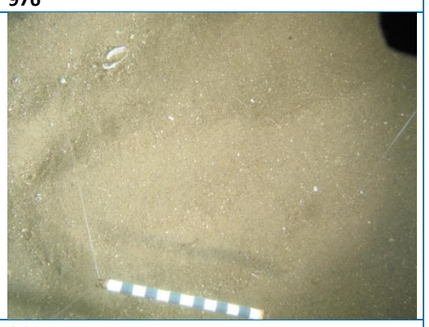
TA_CAM_39					
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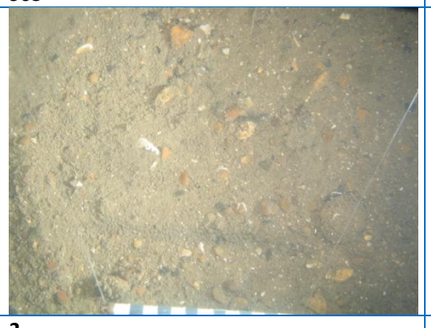
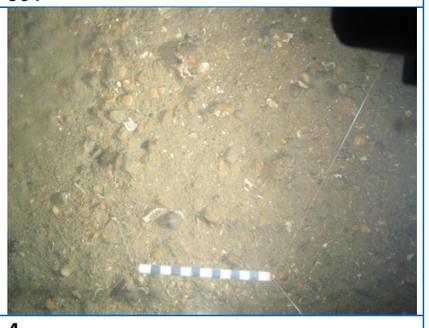
TA_CAM_40					
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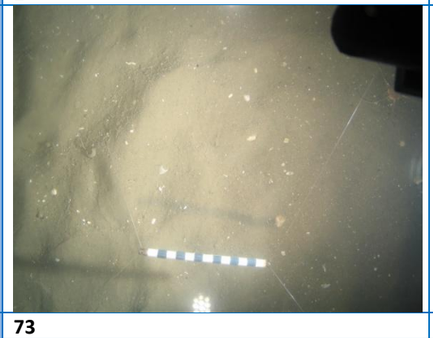
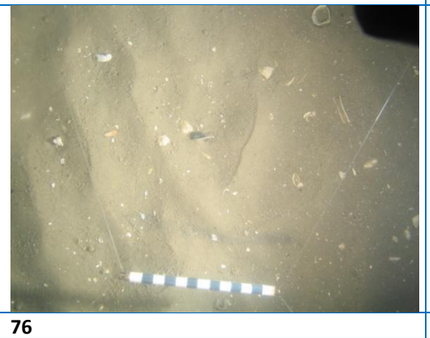
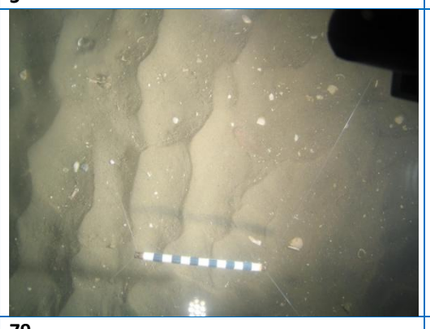
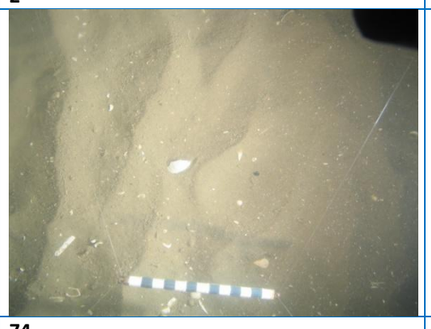
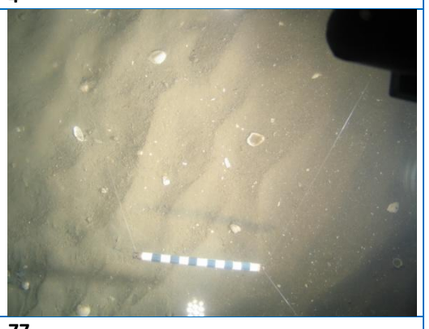
TA_CAM_41					
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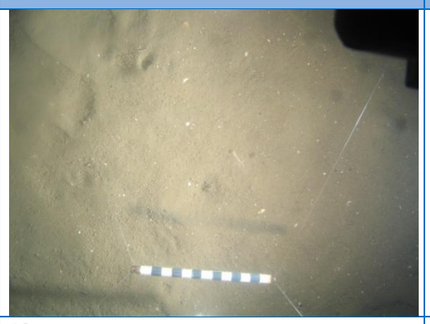
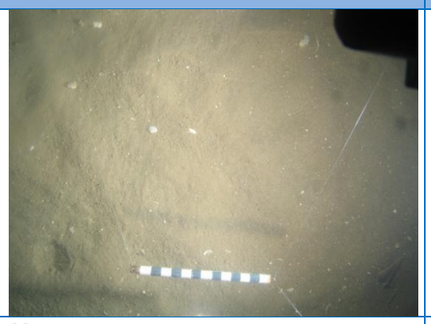
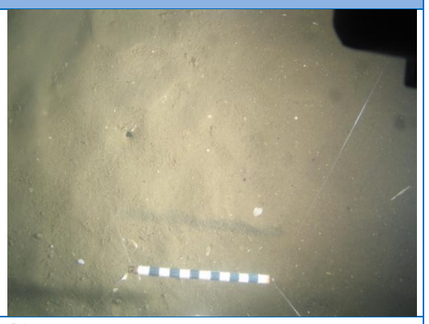
Station ID					
TA_CAM_42					
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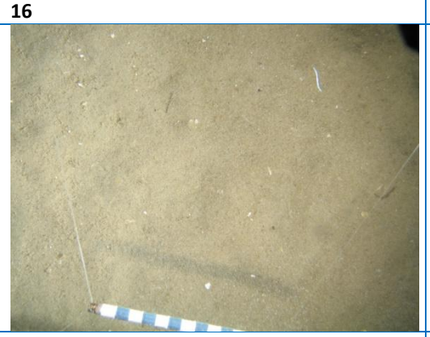
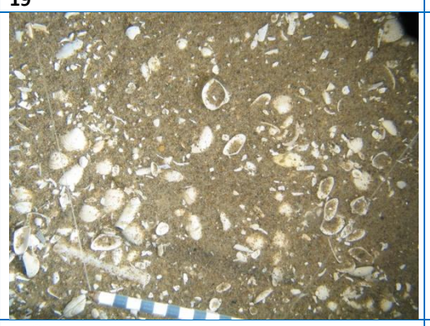
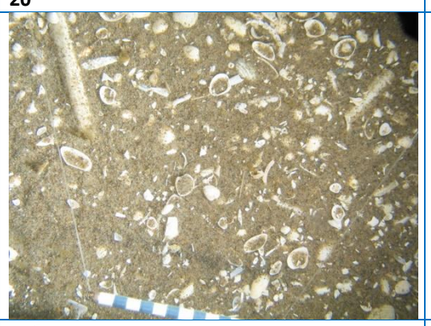
TA_CAM_43					
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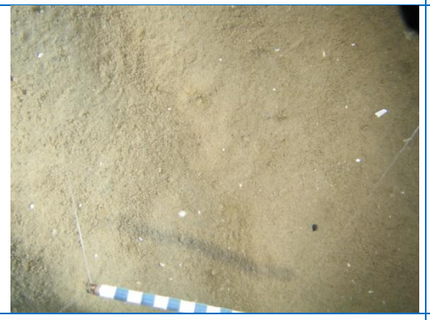
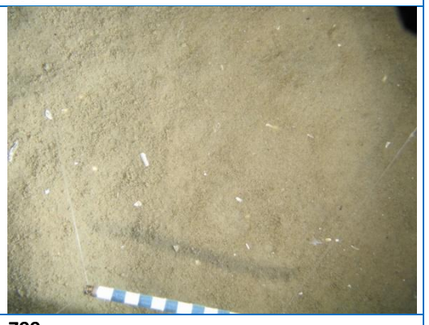
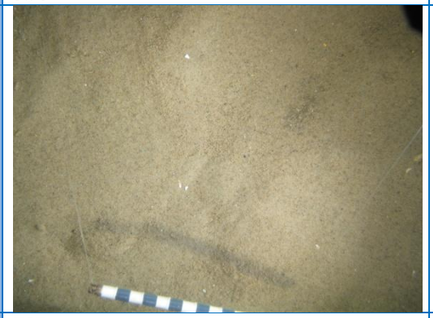
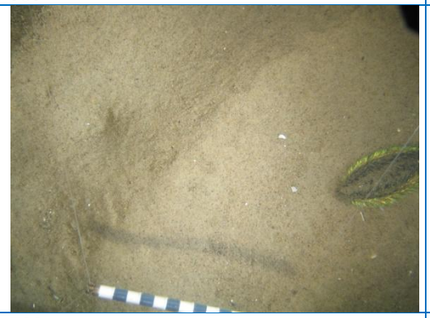
TA_CAM_44					
	794	797	798	796	799
TA_CAM_45					
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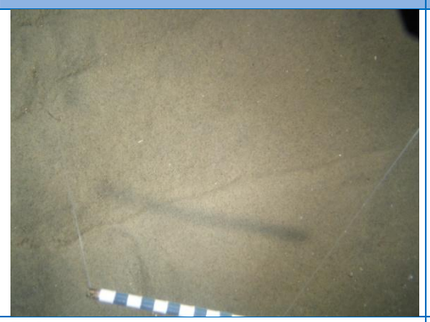
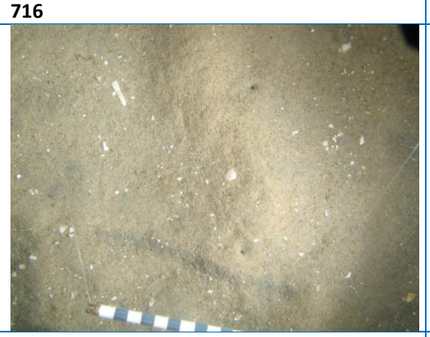
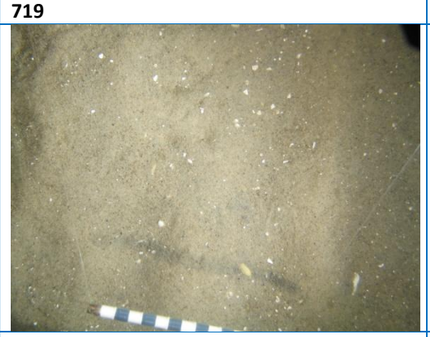
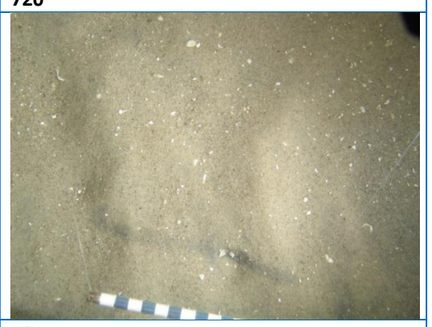
Station ID					
TA_CAM_46					
	714	716	721	719	720
TA_CAM_47					
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TA_CAM_48					
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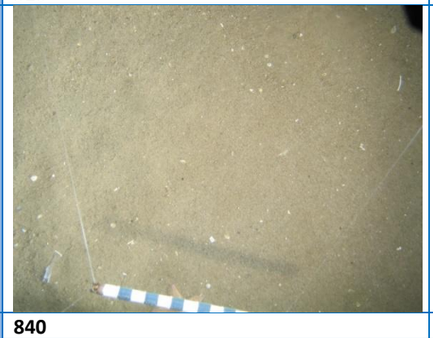
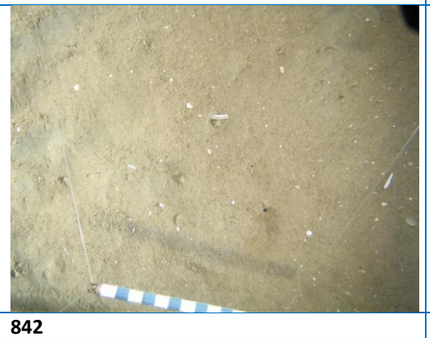
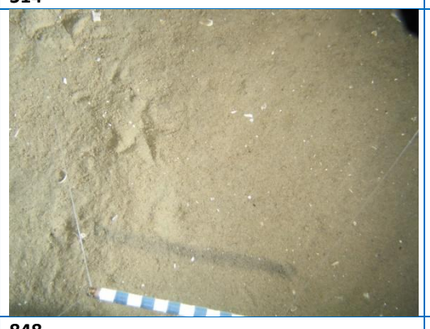
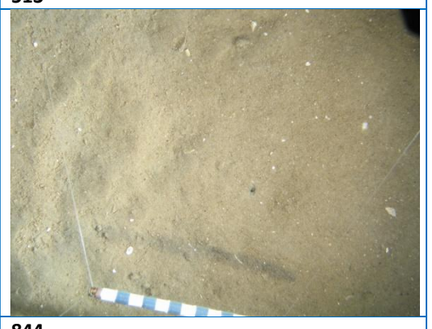
TA_CAM_49					
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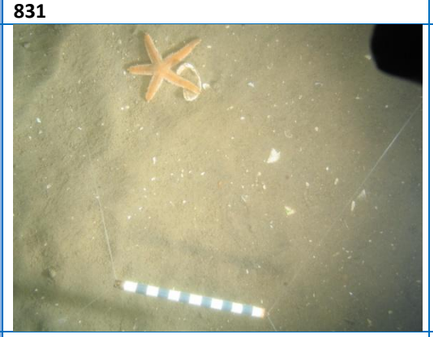
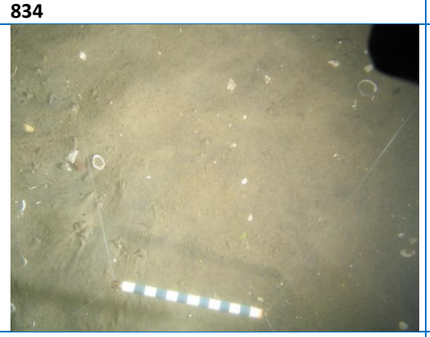
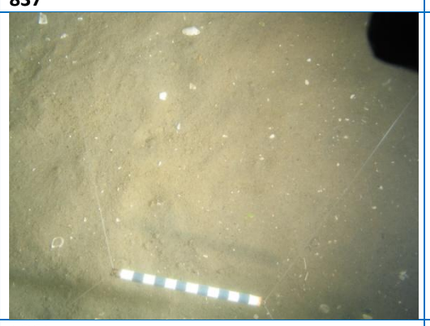
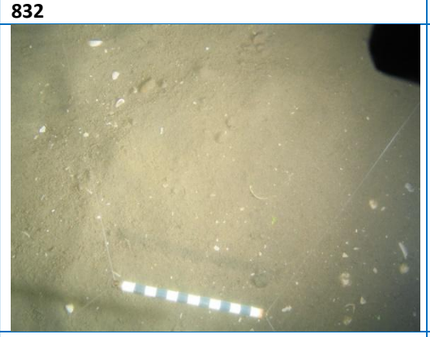
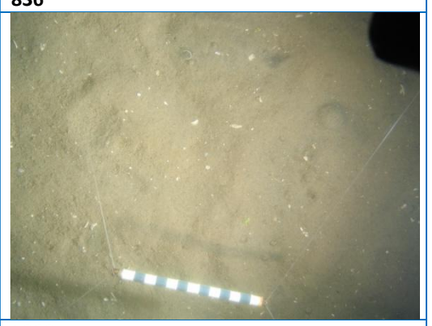
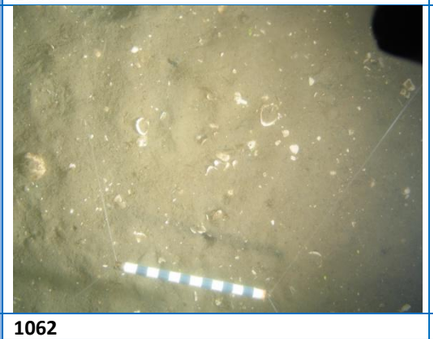
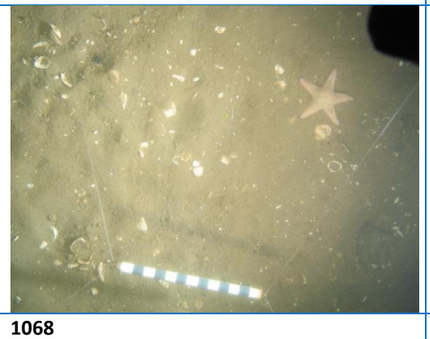
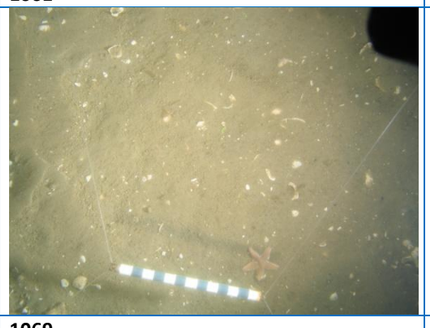
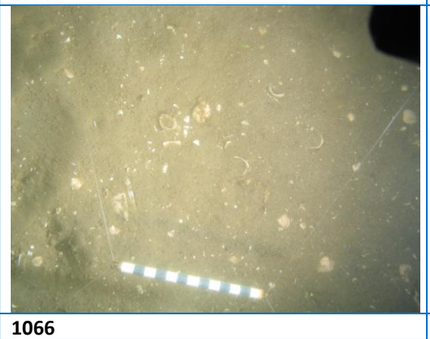
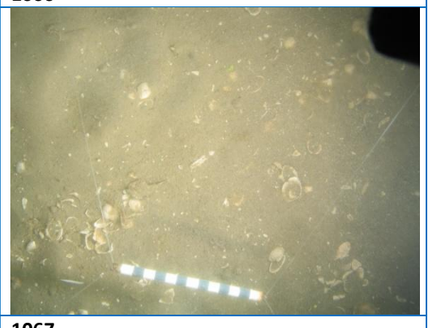
Station ID					
TA_CAM_50					
	831	834	837	832	836
TA_CAM_51					
	1056	1059	1061	1057	1060
TA_CAM_52					
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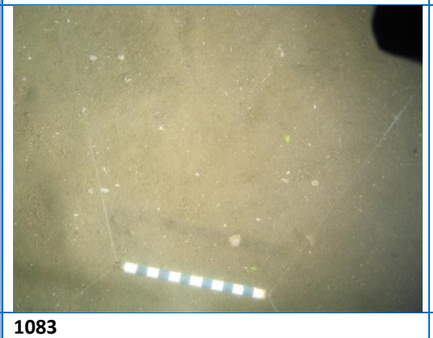
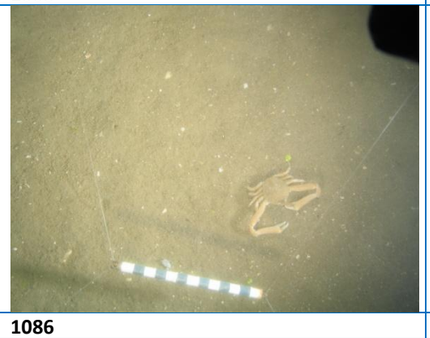
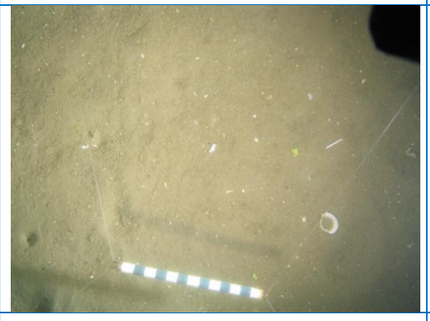
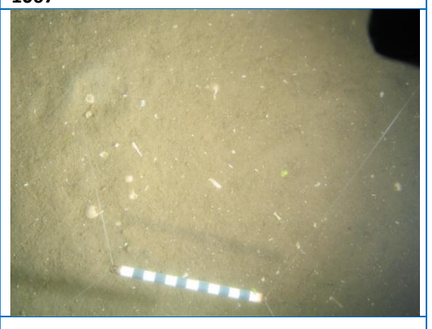
TA_CAM_53					
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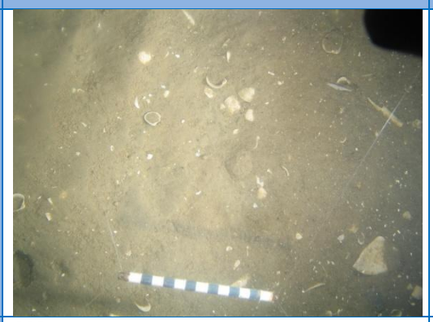
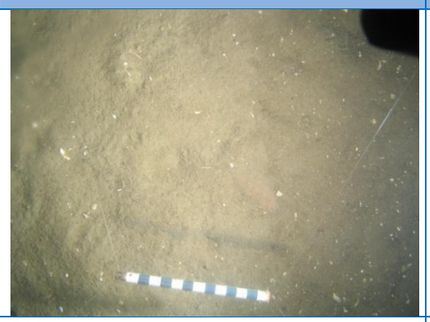
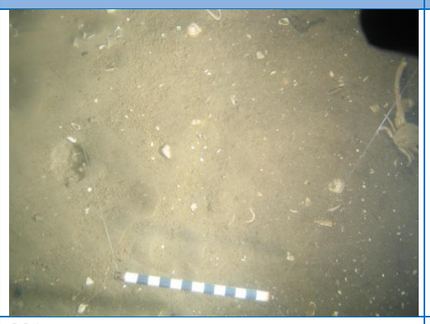
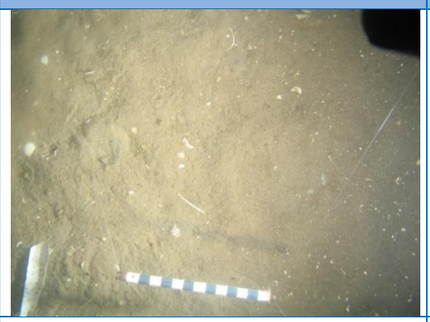
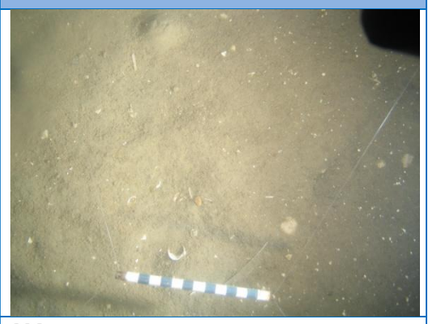
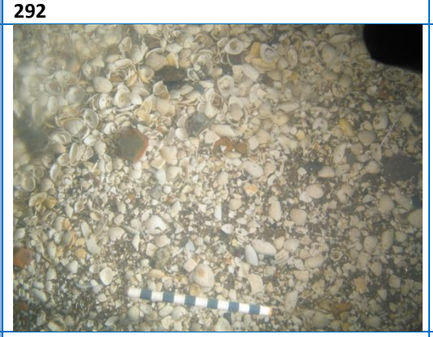
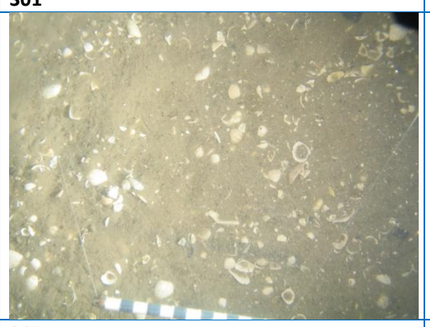
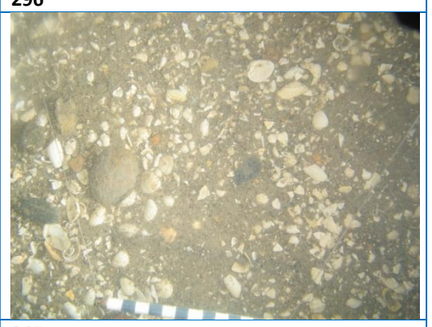
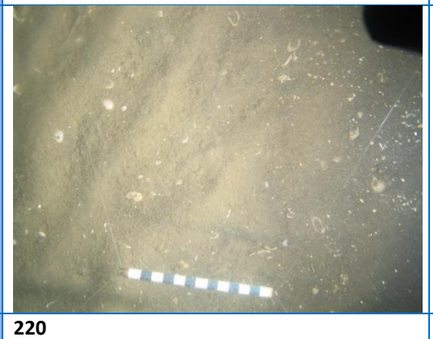
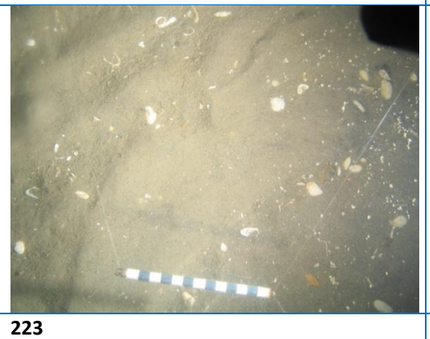
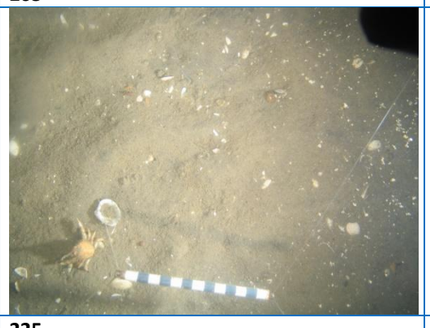
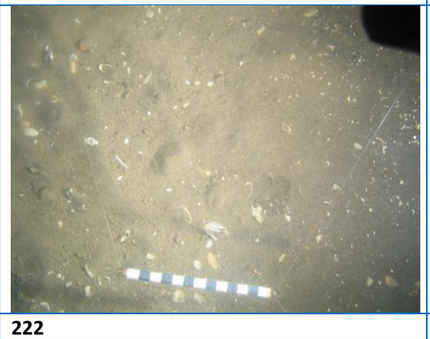
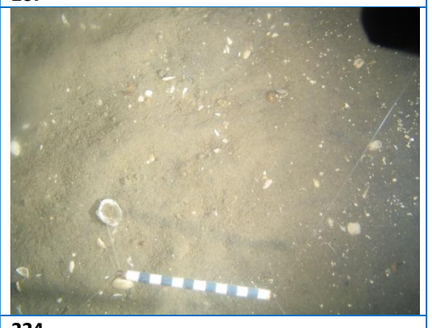
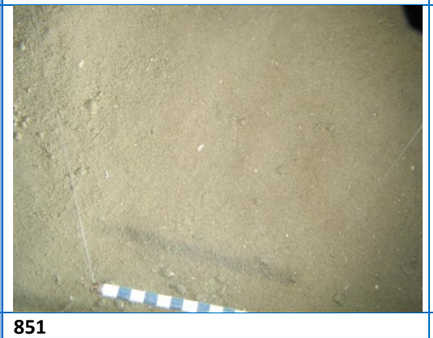
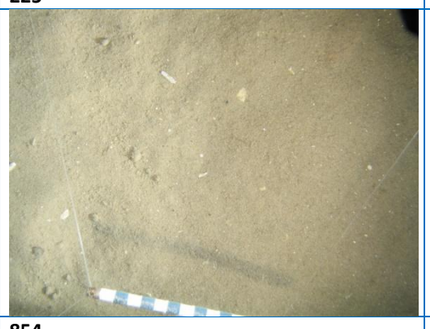
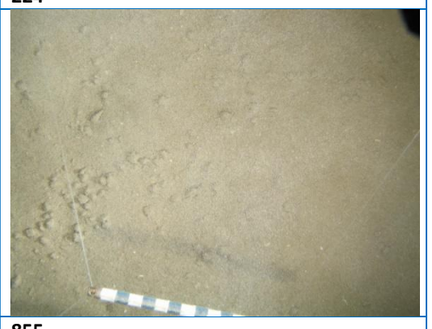
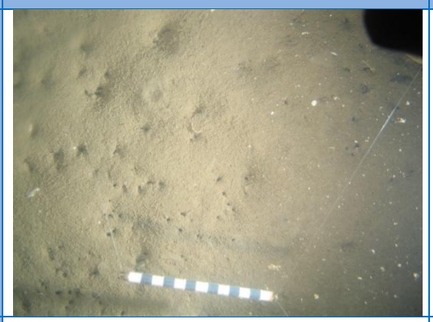
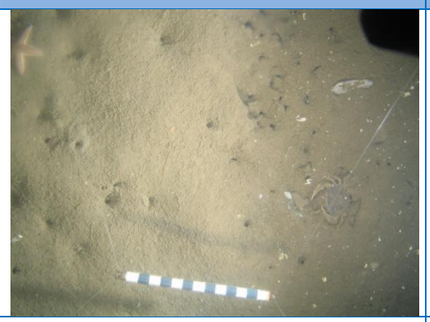
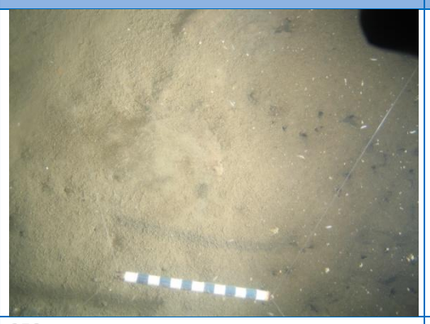
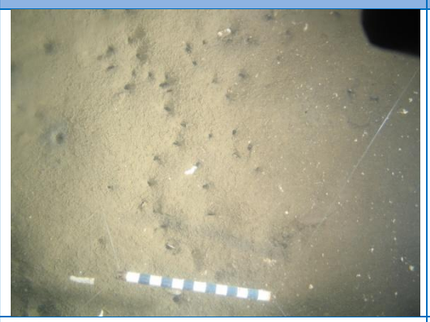
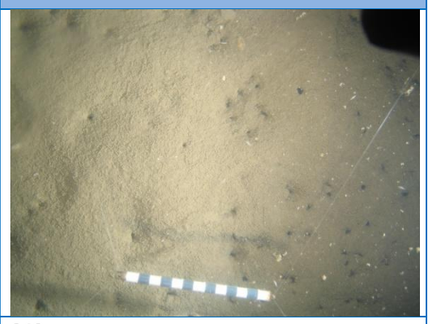
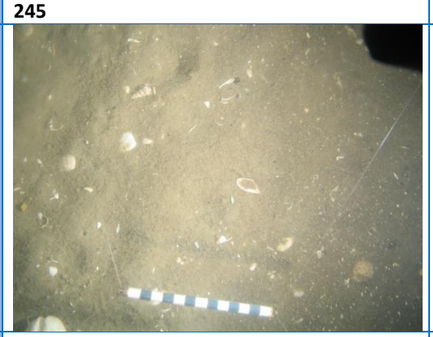
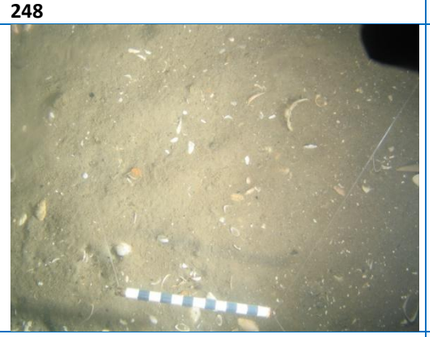
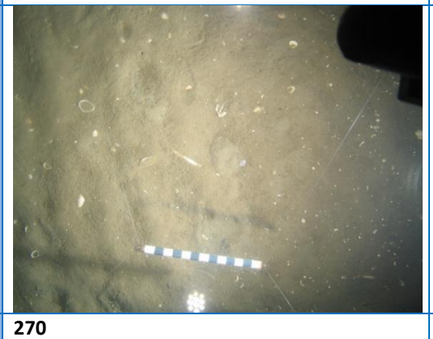
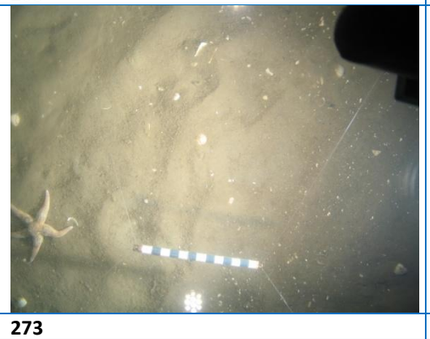
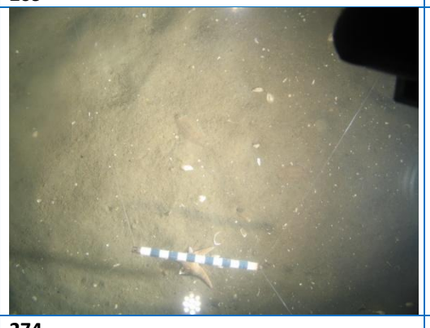
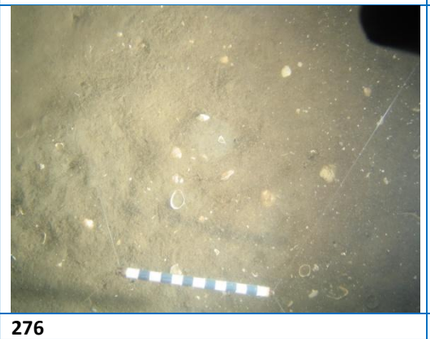
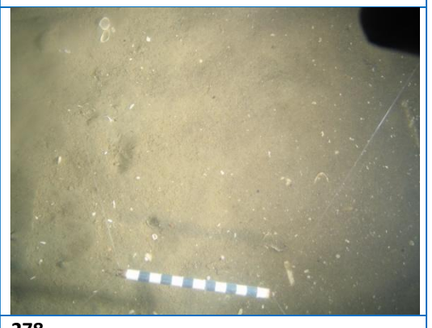
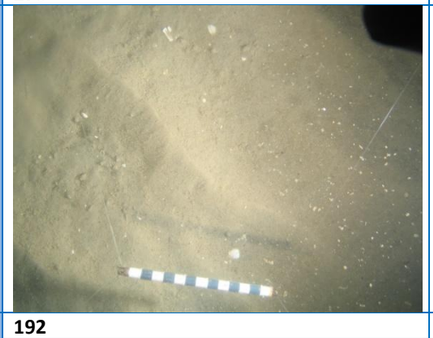
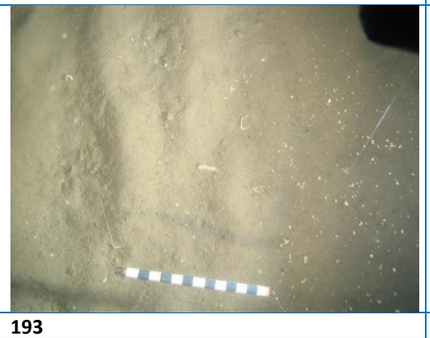
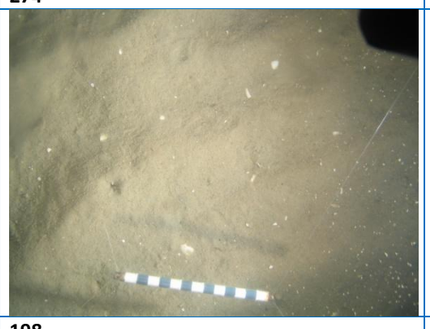
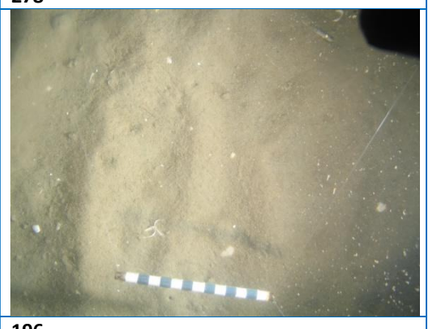
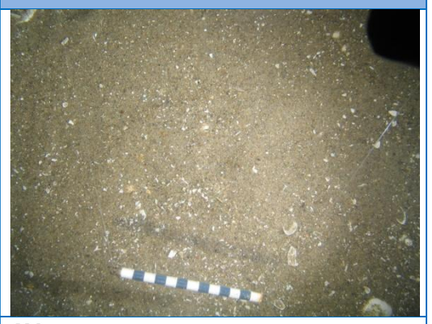
Station ID					
TA_CAM_54					
	292	294	301	295	296
TA_CAM_55					
	254	256	265	259	267
TA_CAM_56					
	220	223	225	222	224
TA_CAM_57					
	851	852	854	853	855

Station ID					
TA_CAM_58					
	245	248	252	246	249
TA_CAM_59					
	205	208	209		
TA_CAM_60					
	270	273	274	276	278
TA_CAM_61					
	192	193	198	195	196

Station ID					
TA_CAM_62					
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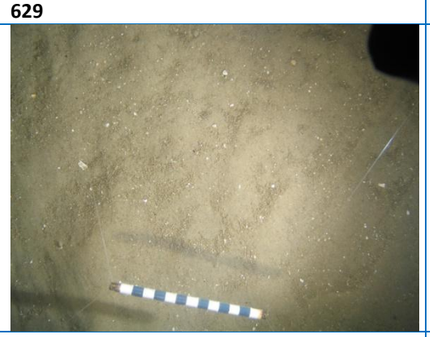
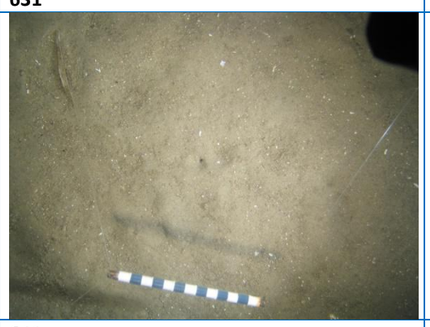
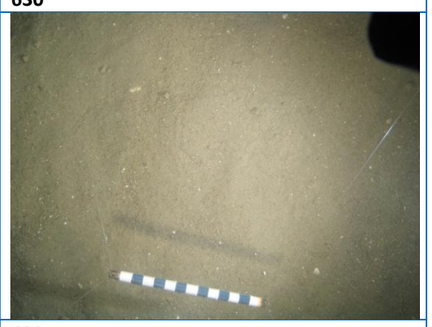
TA_CAM_63					
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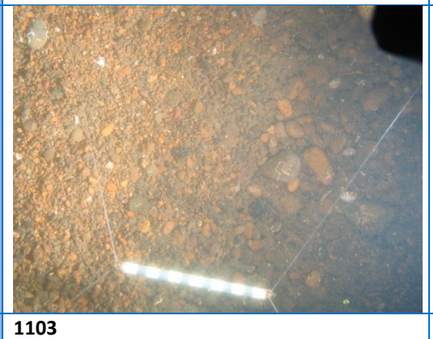
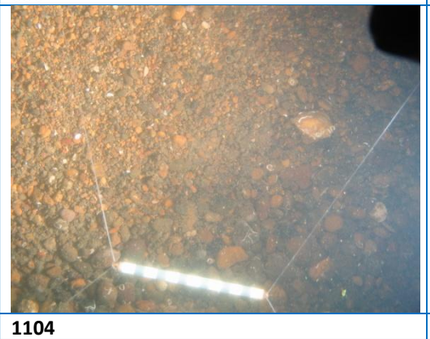
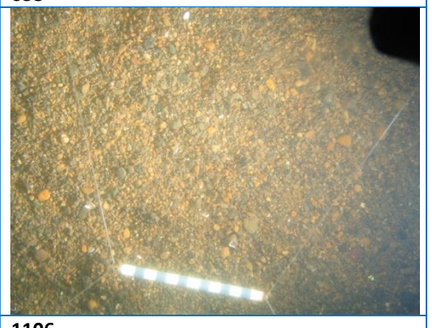
TA_CAM_64					
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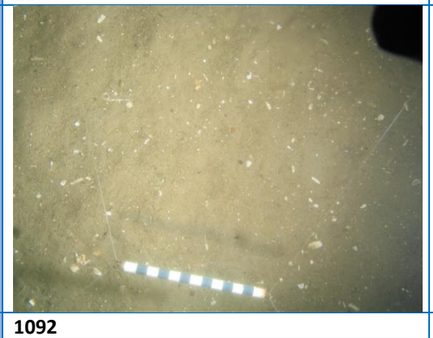
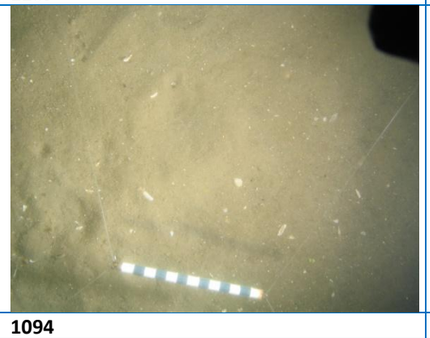
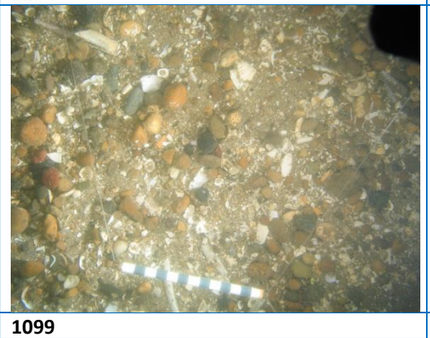
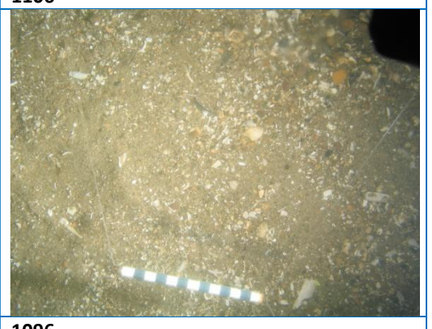
TA_CAM_65					
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Station ID					
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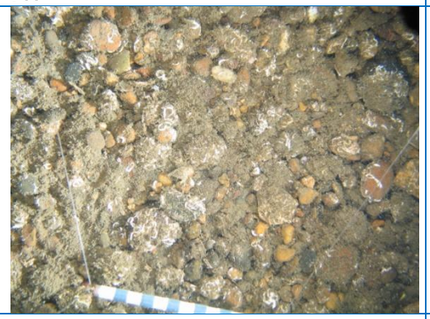
TA_CAM_67					
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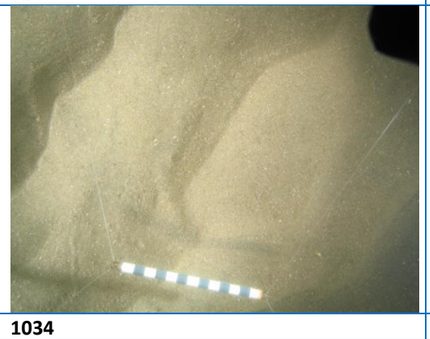
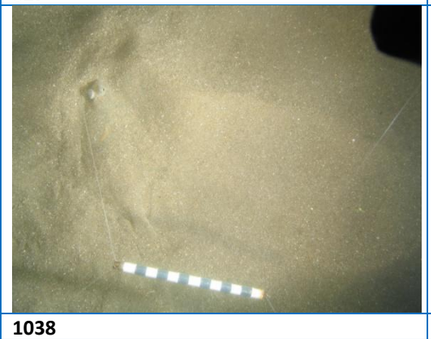
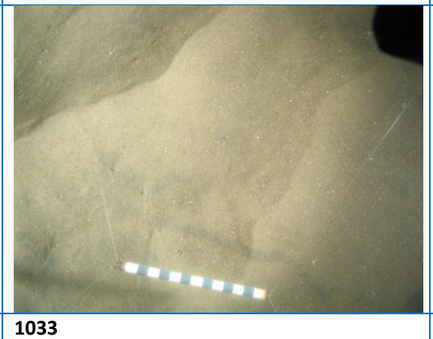
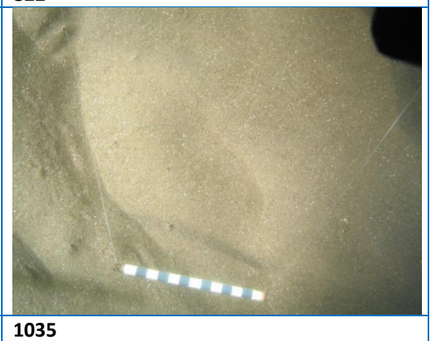
TA_CAM_68					
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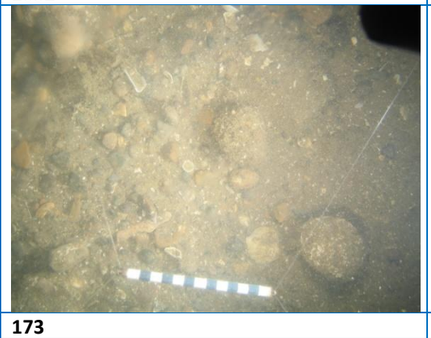
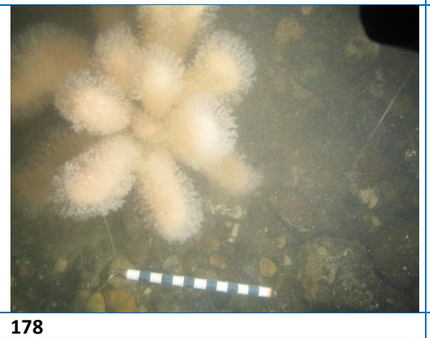
TA_CAM_69					
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		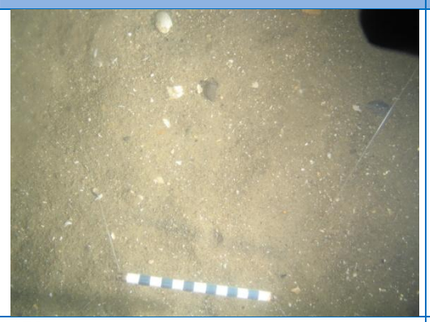		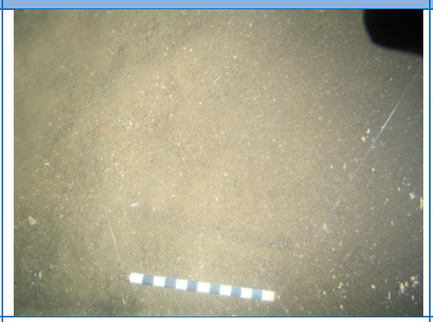	
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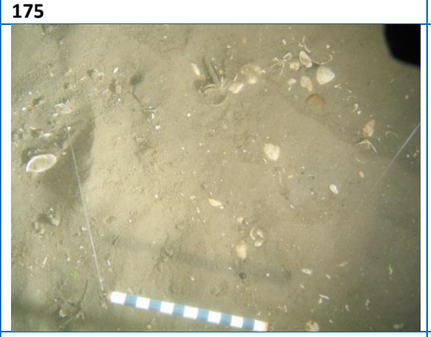
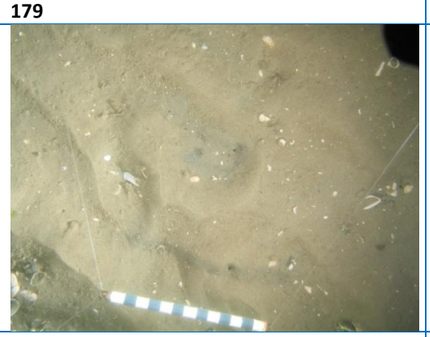
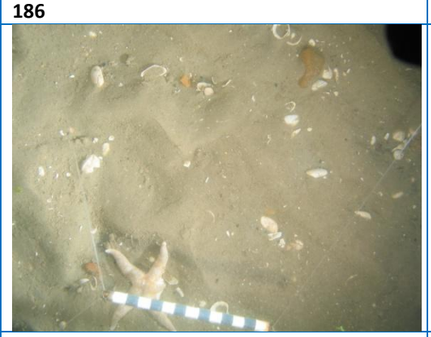
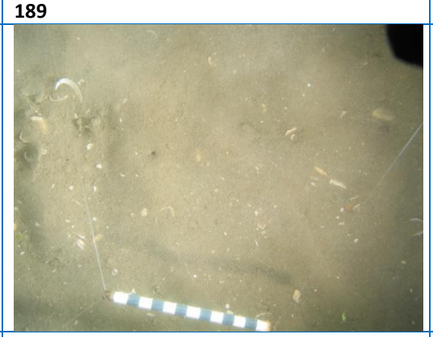
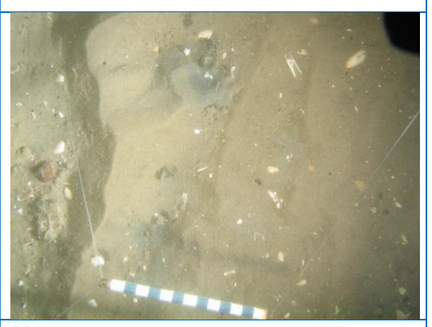
TA_CAM_70					
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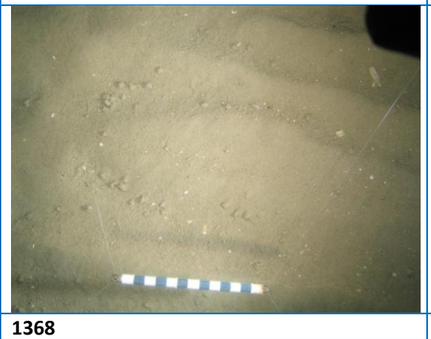
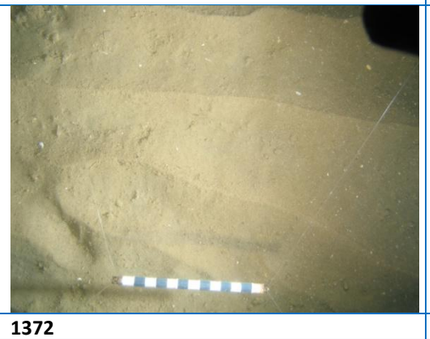
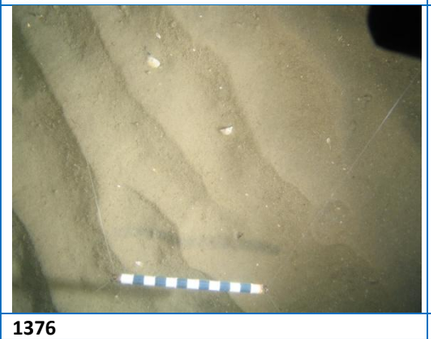
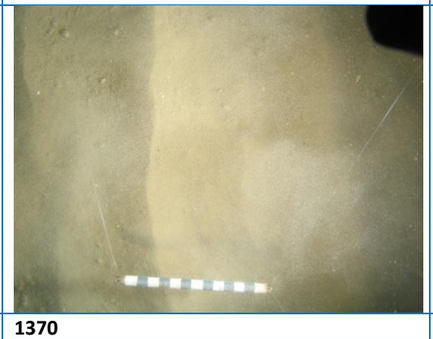
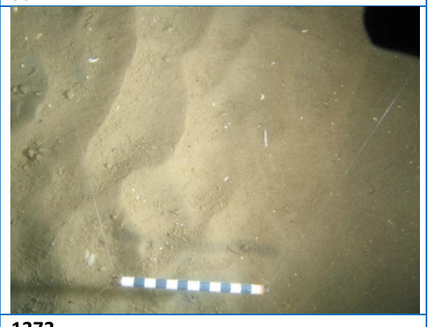
TA_CAM_71					
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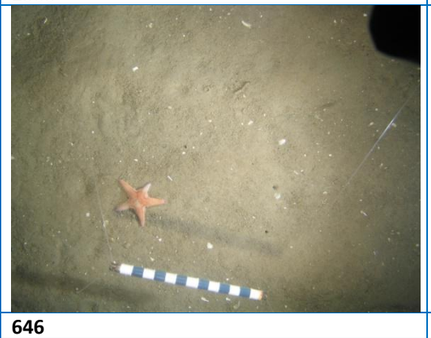
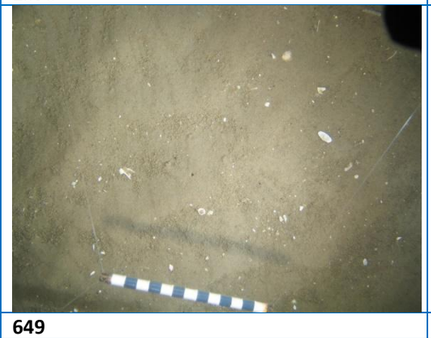
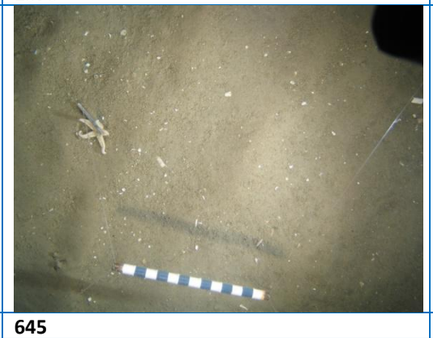
TA_CAM_72					
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Station ID					
TA_CAM_73					
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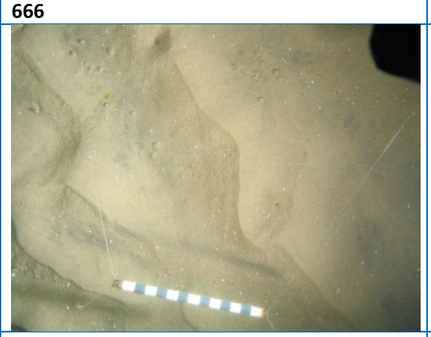
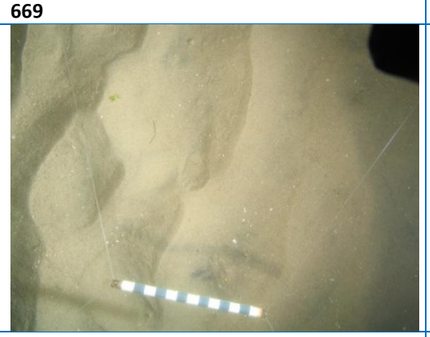
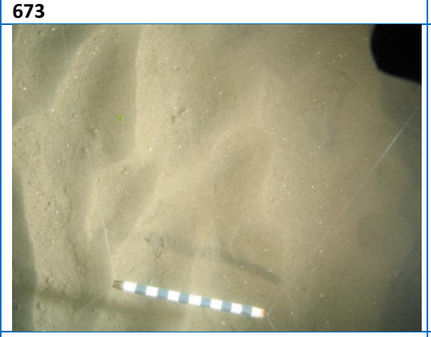
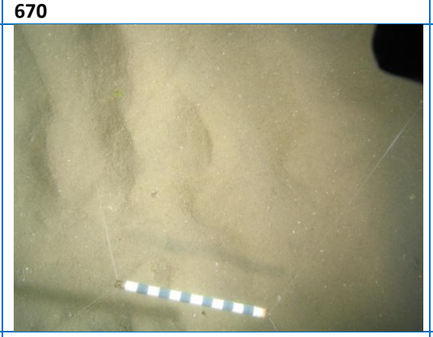
TA_CAM_74					
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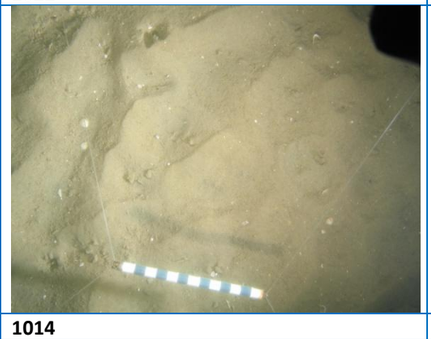
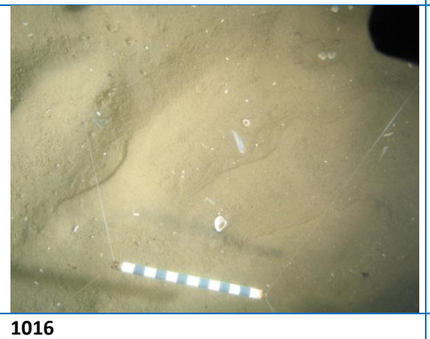
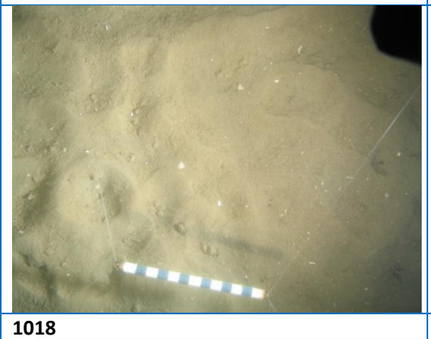
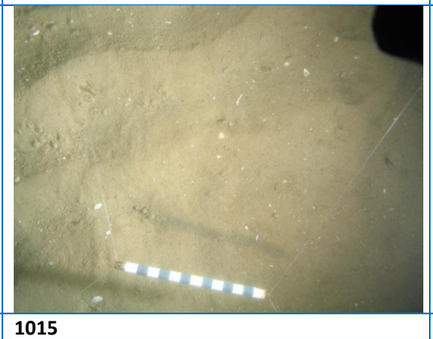
TA_CAM_75					
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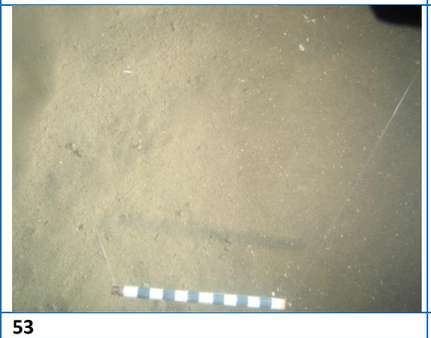
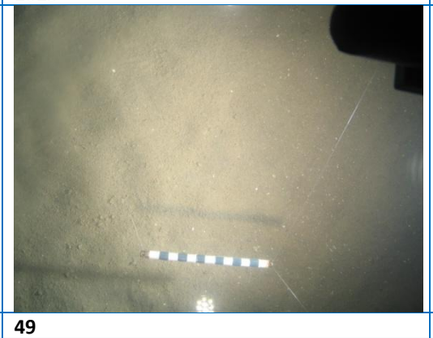
TA_CAM_76					
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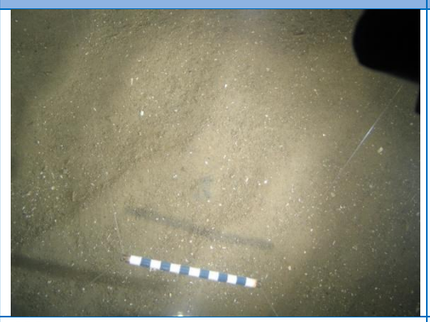
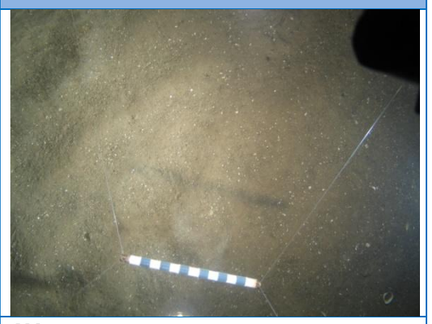
TA_CAM_77					
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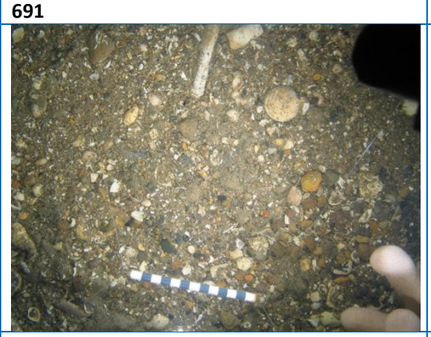
TA_CAM_78					
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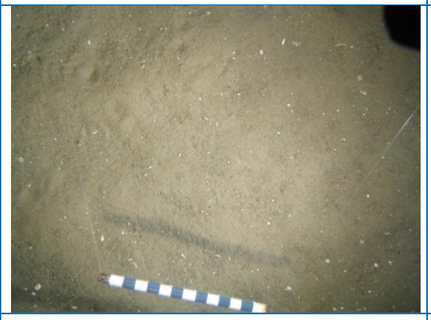
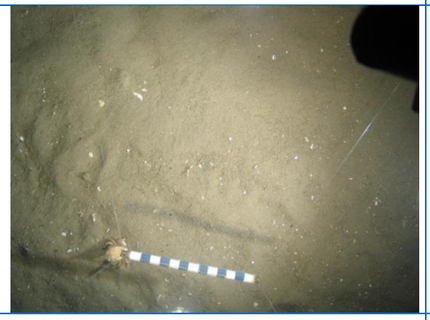
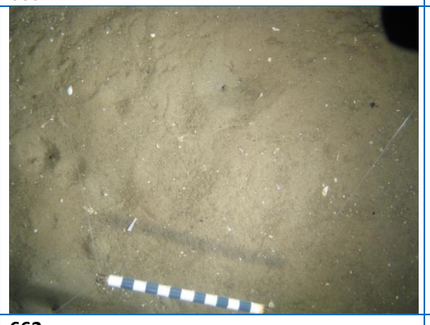
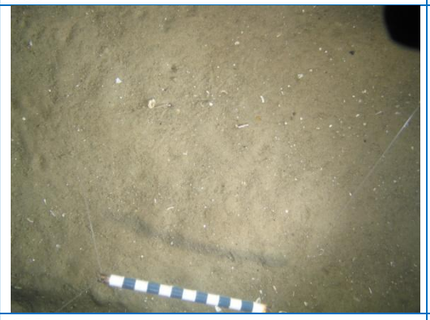
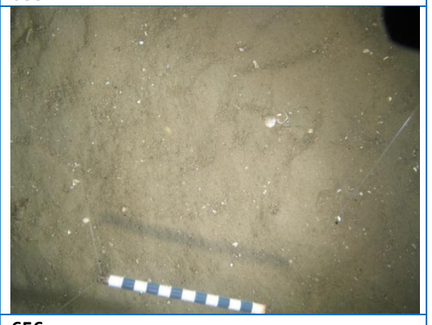
TA_CAM_79					
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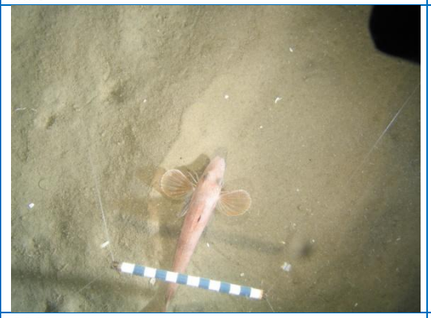
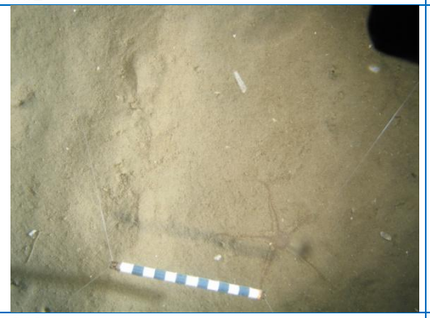
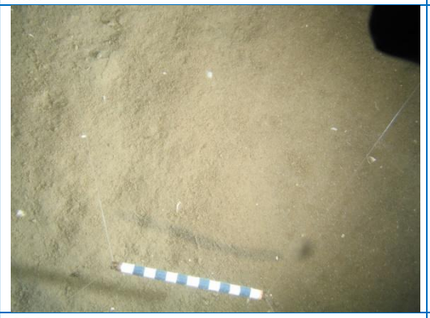
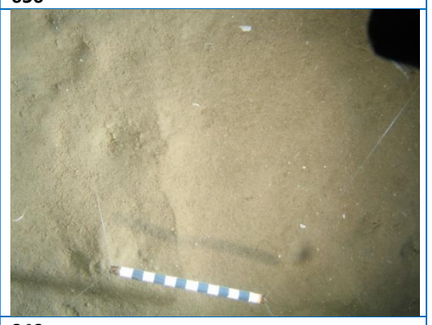
TA_CAM_80					
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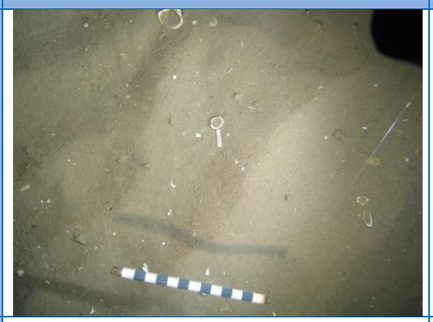
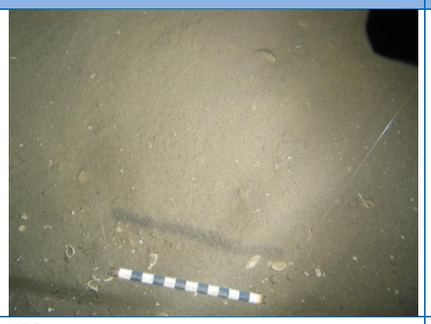
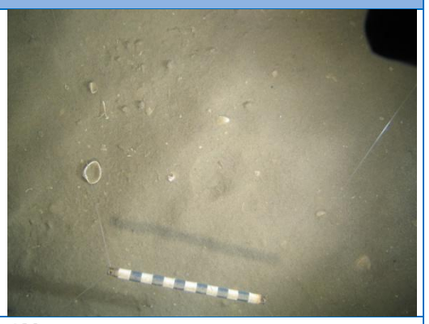
Station ID					
TA_CAM_81					
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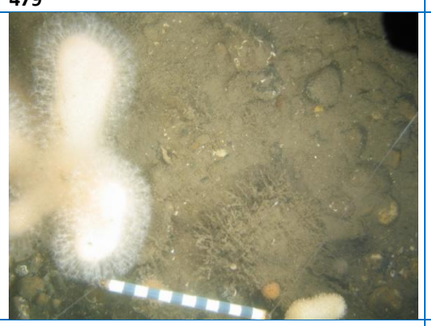
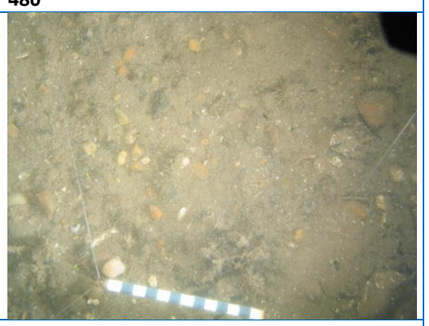
TA_CAM_82					
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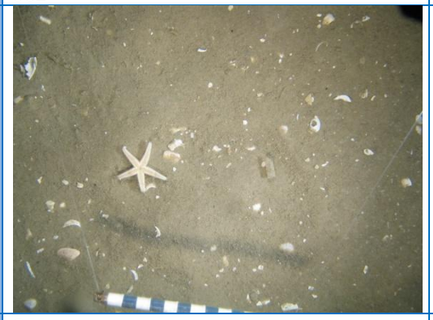
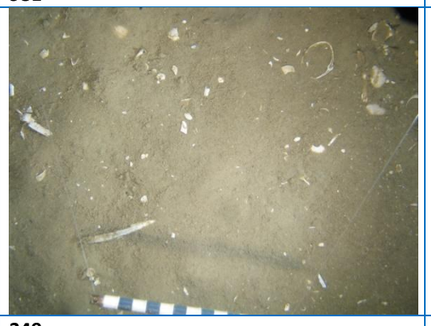
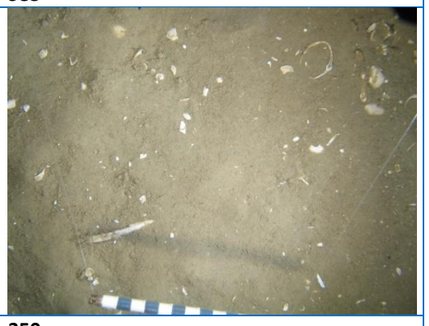
TA_CAM_83					
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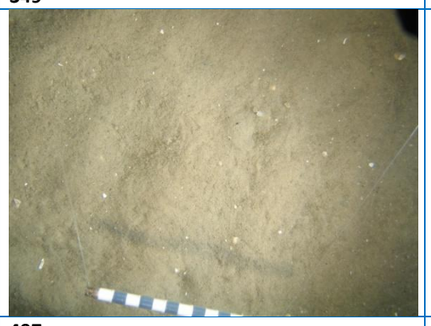
TA_CAM_84					
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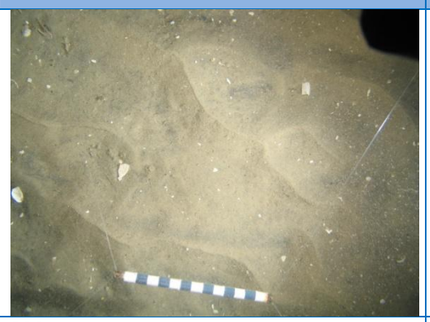
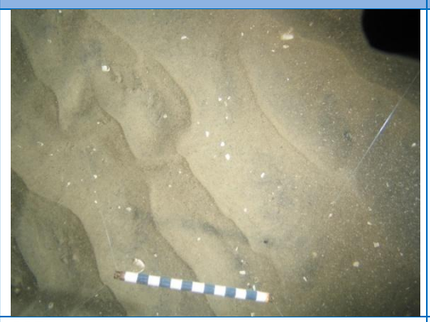
Station ID					
TA_CAM_85					
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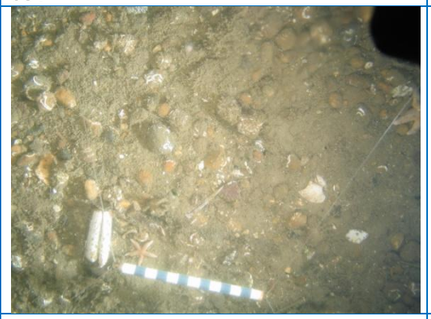
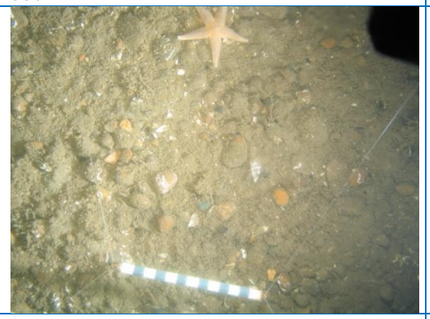
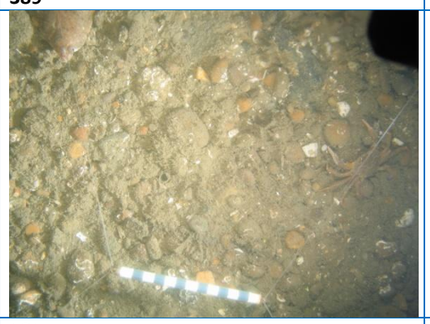
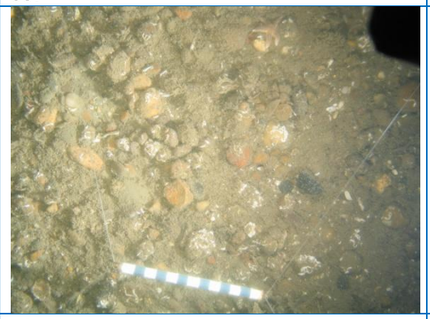
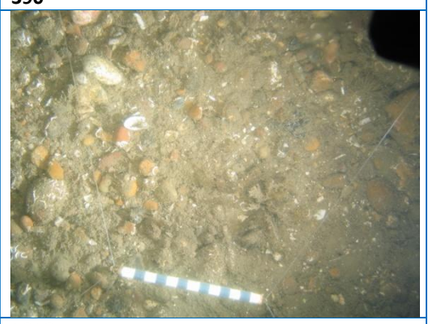
TA_CAM_86					
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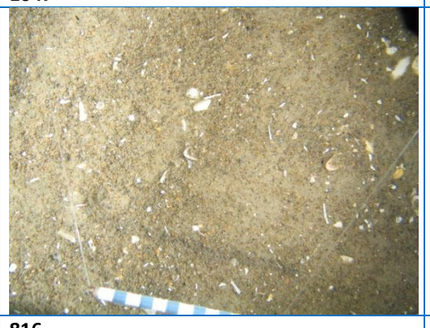
TA_CAM_87					
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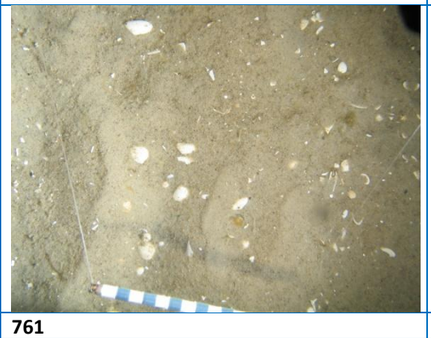
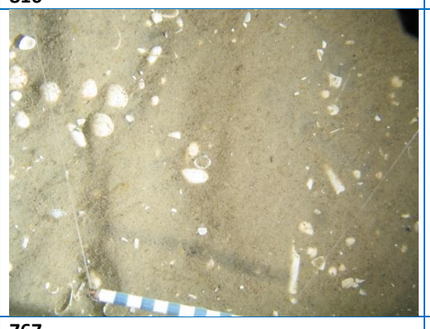
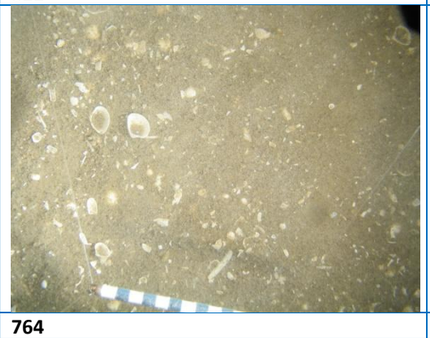
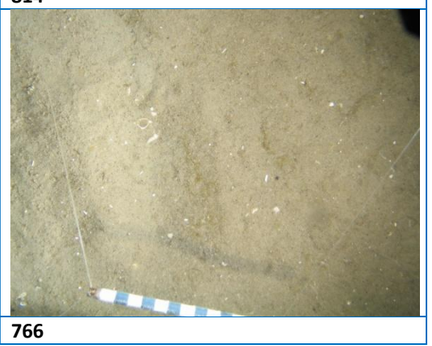
TA_CAM_88					
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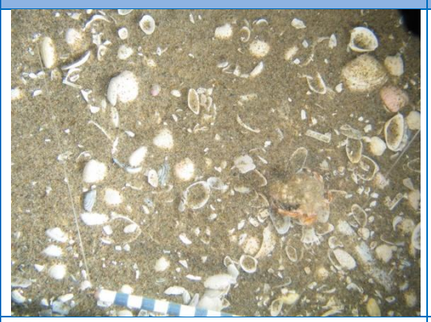
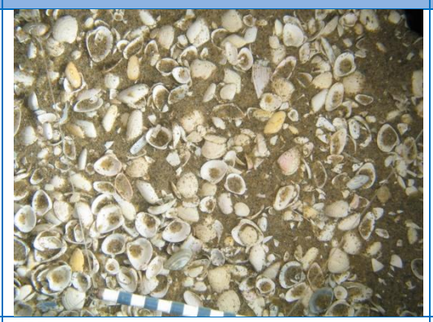
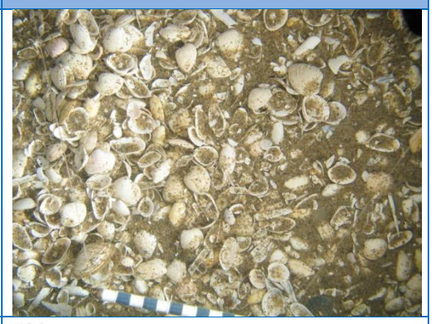
Station ID					
TA_CAM_89					
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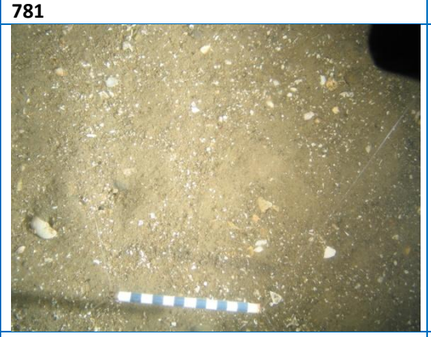
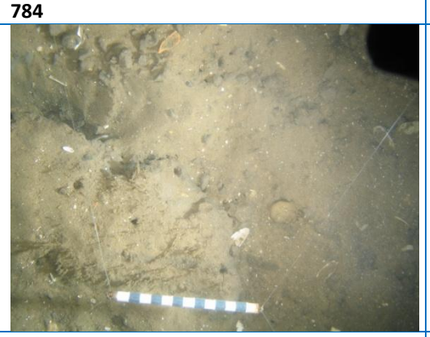
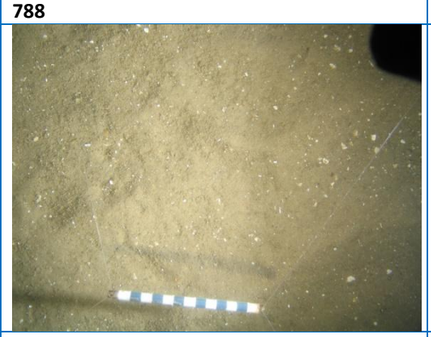
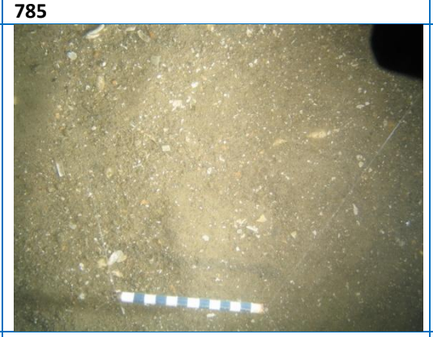
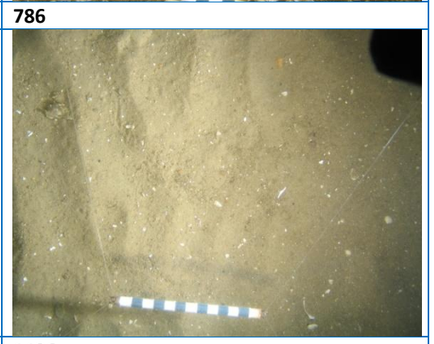
TA_CAM_90					
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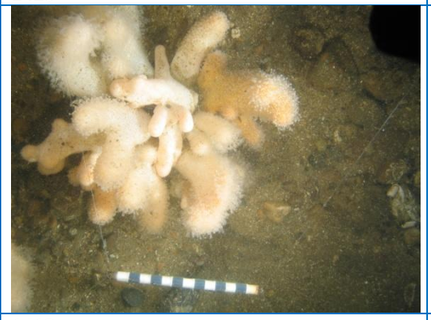
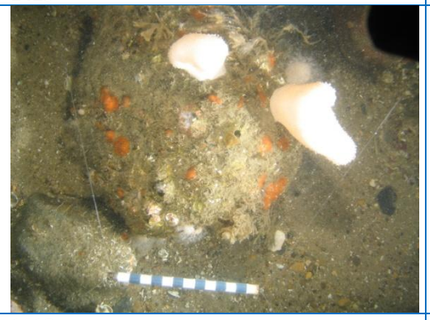
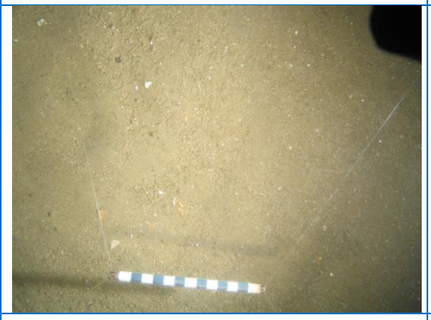
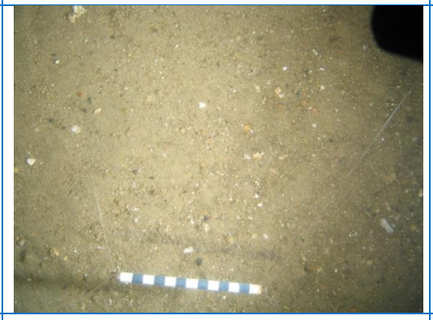
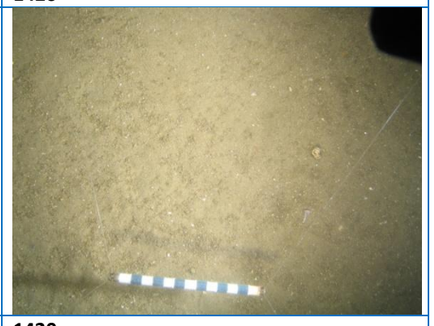
TA_CAM_91					
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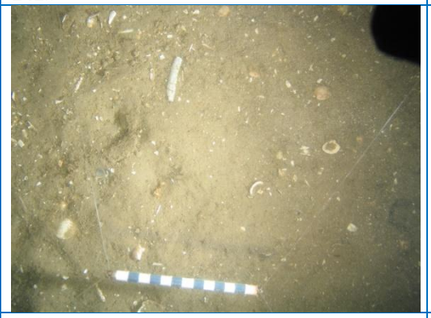
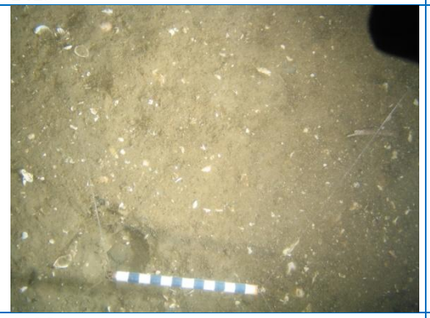
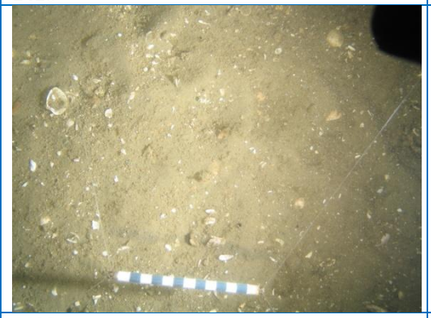
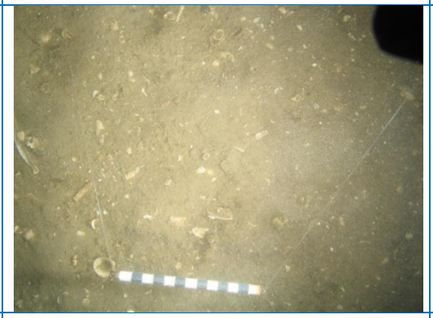
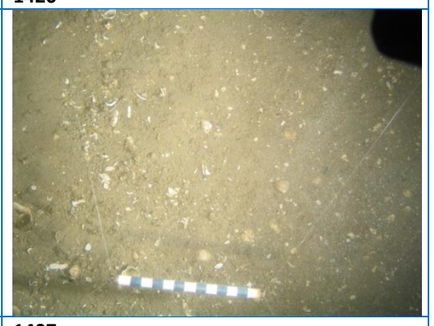
TA_CAM_92					
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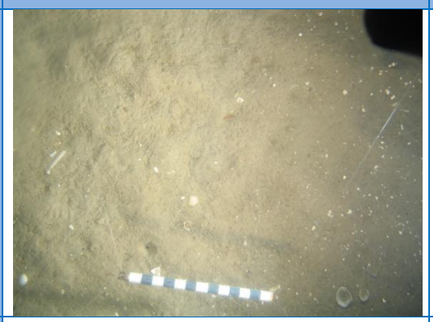
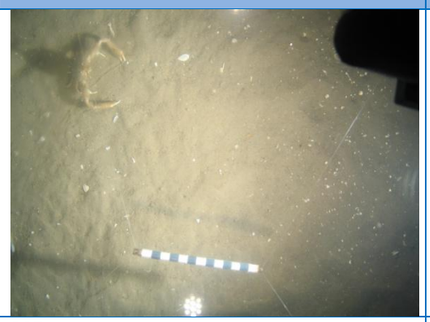
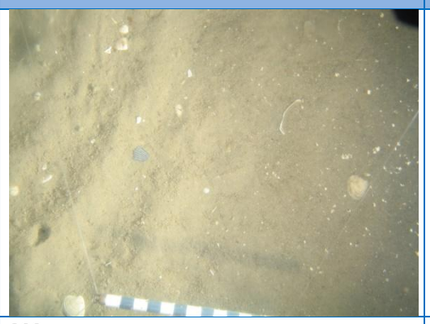
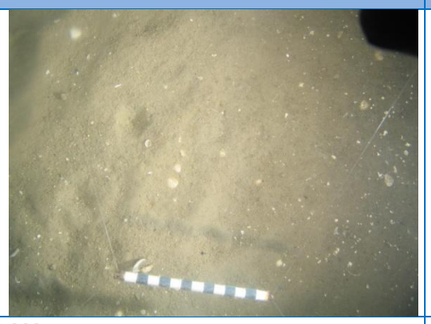
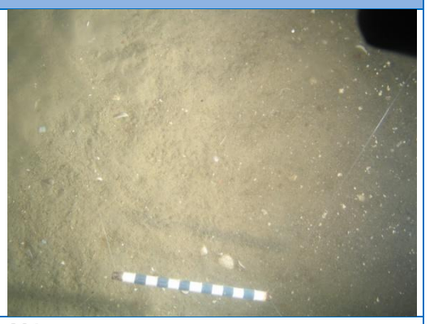
Station ID					
TA_CAM_93					
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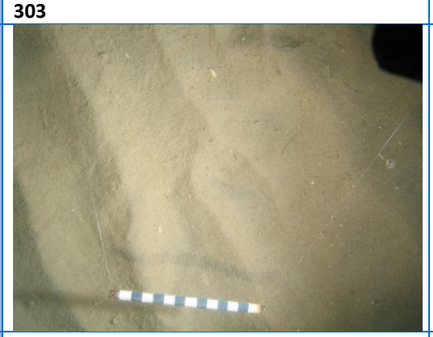
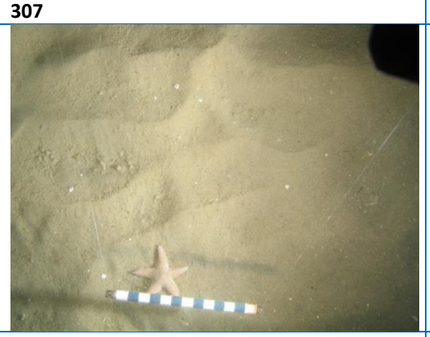
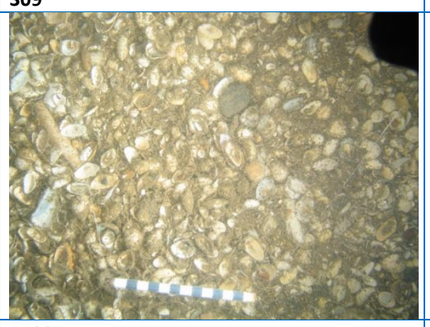
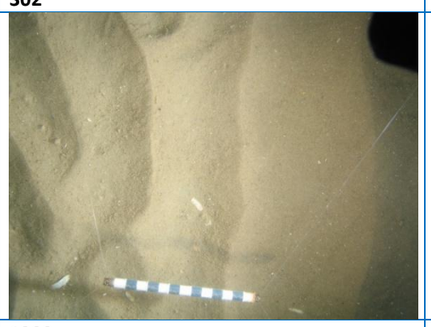
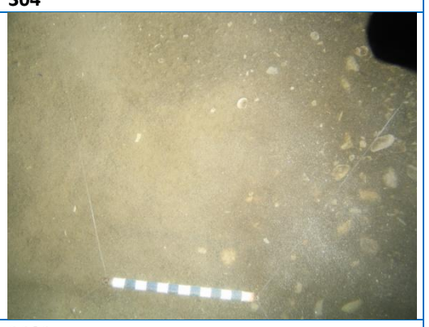
TA_CAM_94					
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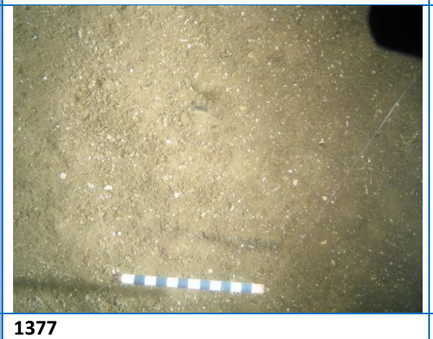
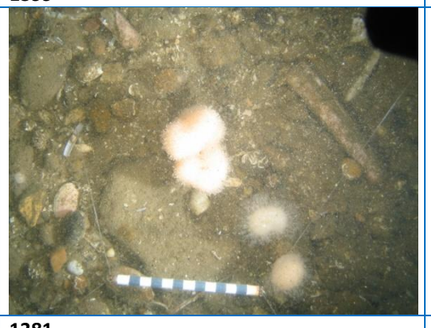
TA_CAM_95					
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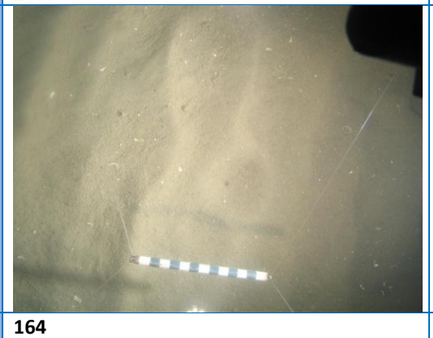
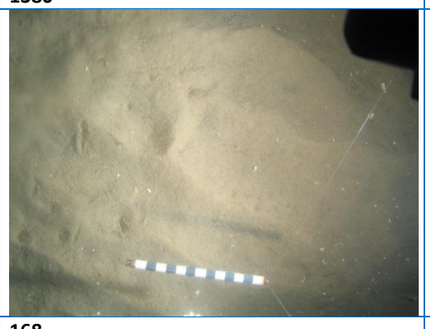
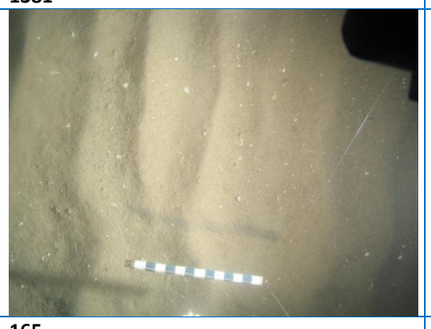
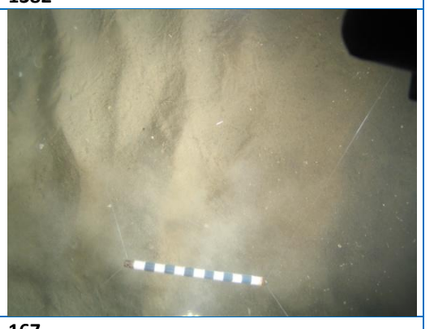
TA_CAM_96					
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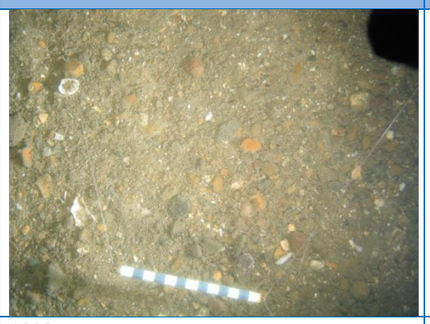
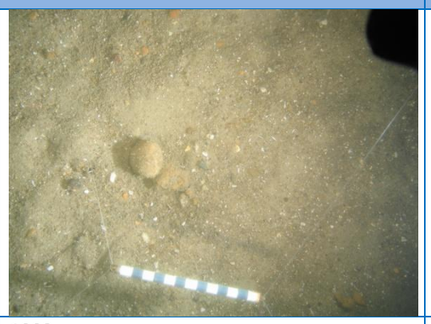
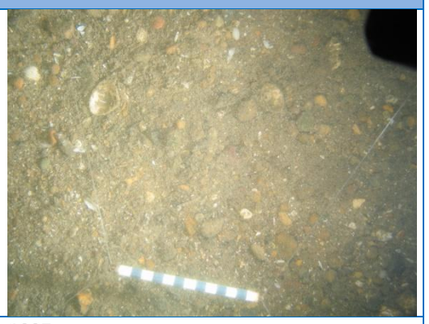
Station ID					
TA_CAM_97					
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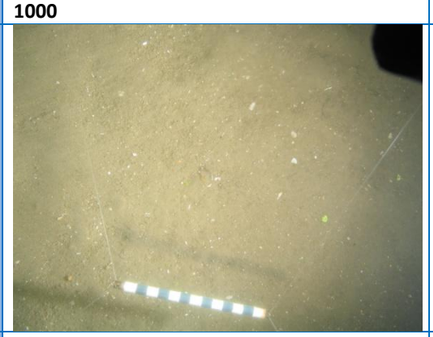
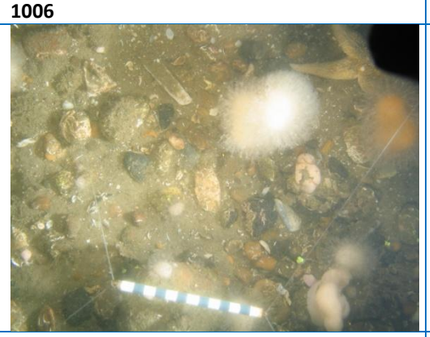
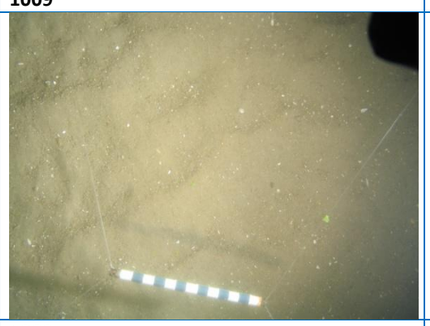
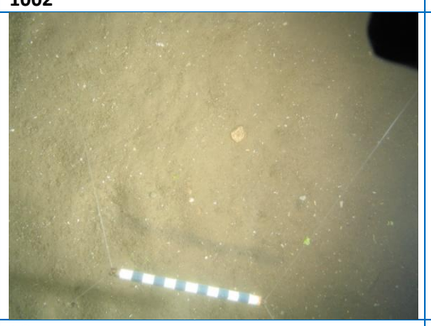
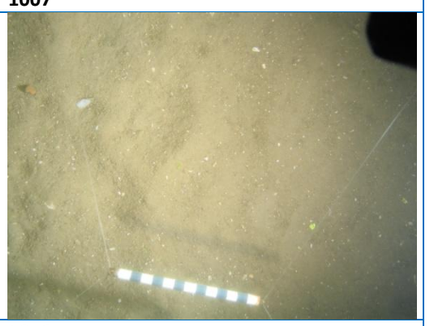
TA_CAM_98					
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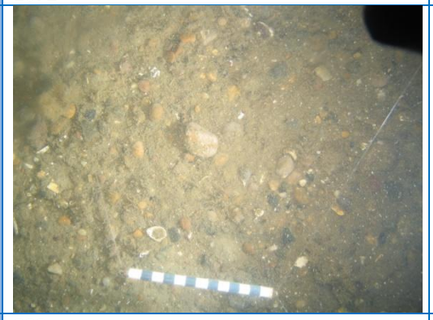
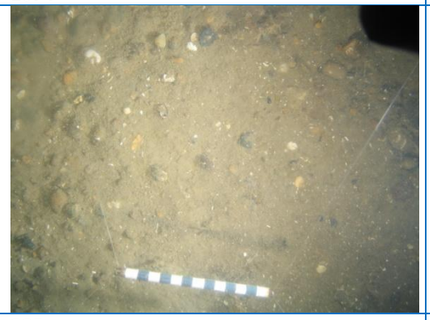
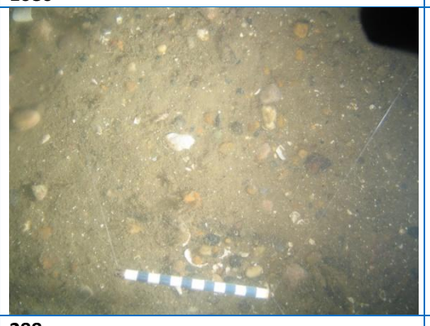
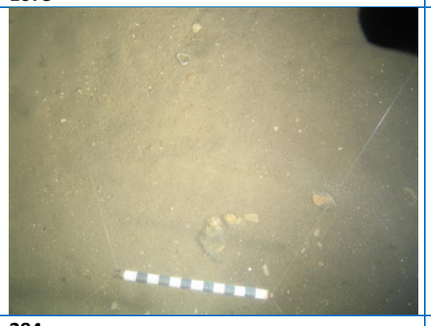
TA_CAM_99					
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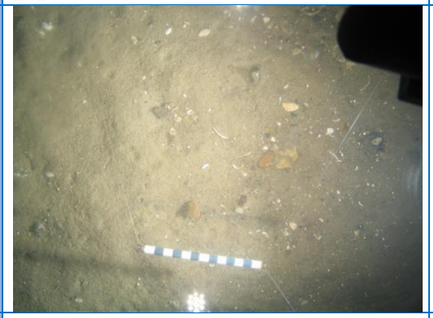
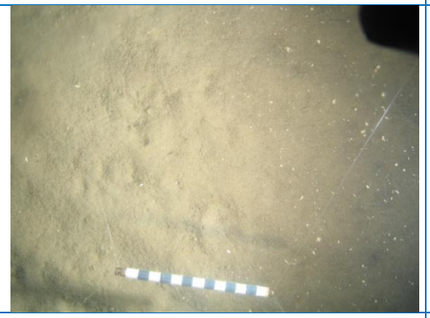
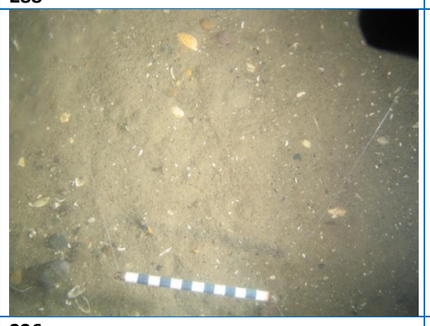
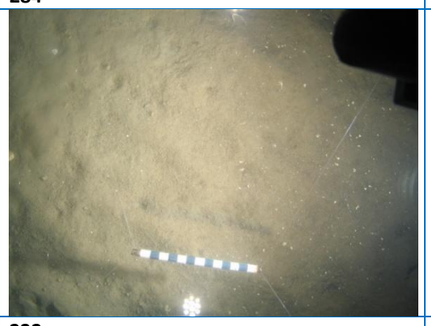
TA_CAM_100					
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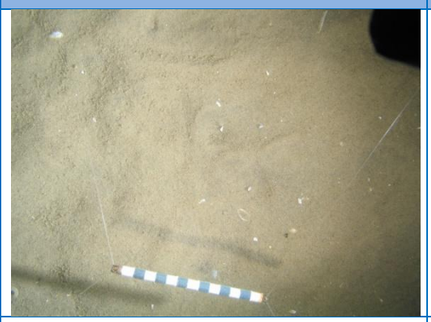
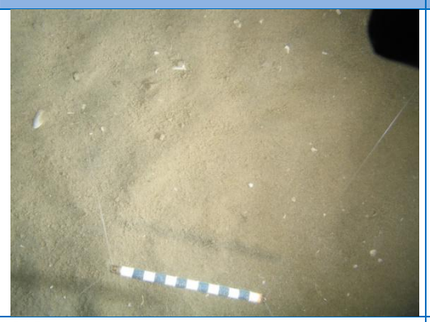
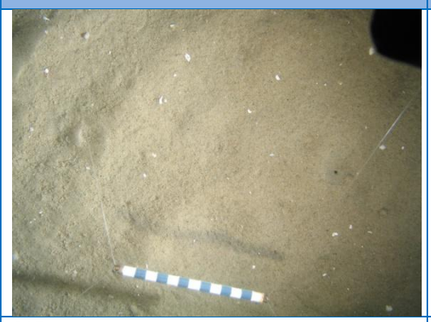
Station ID					
TA_CAM_101					
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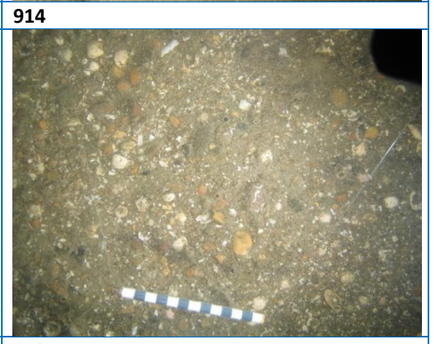
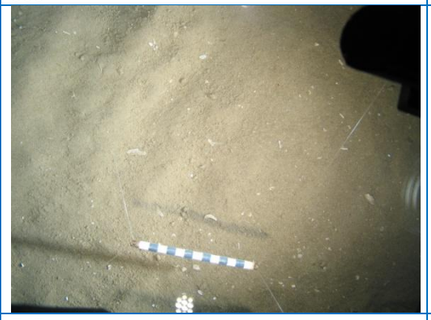
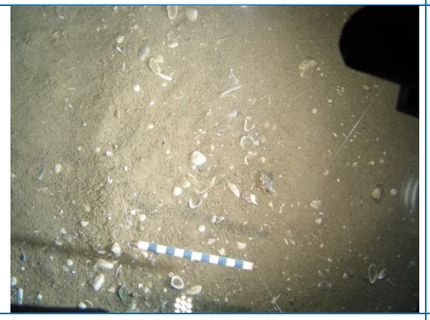
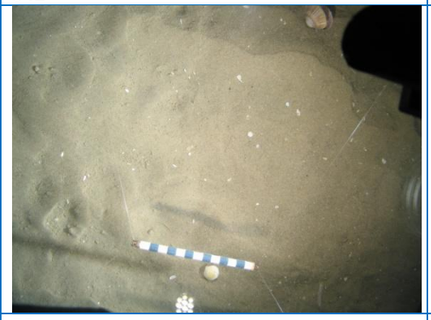
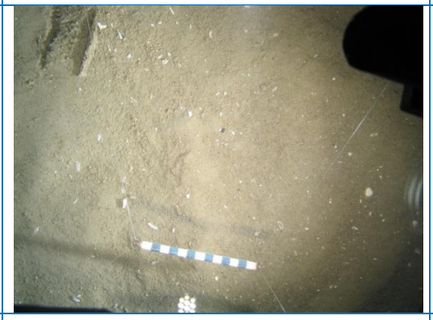
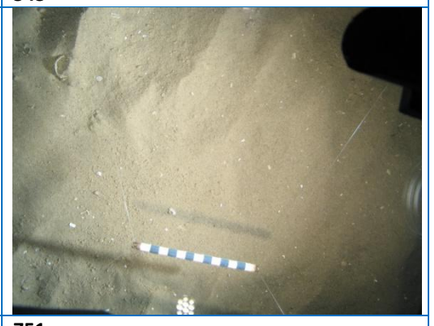
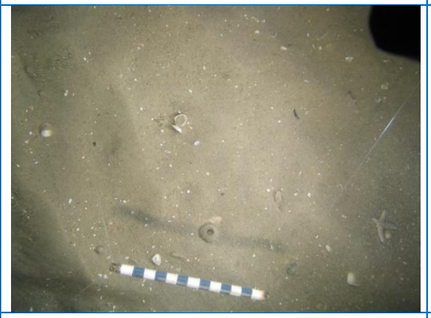
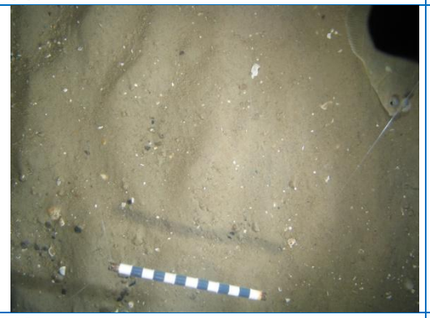
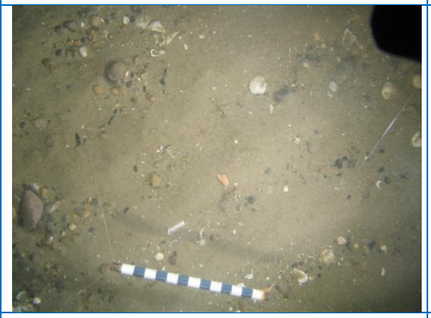
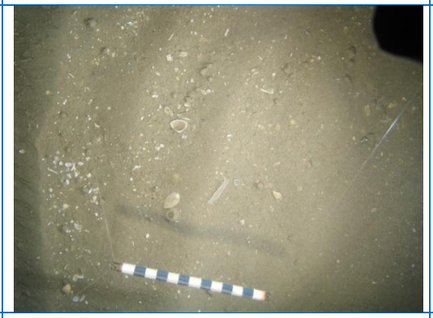
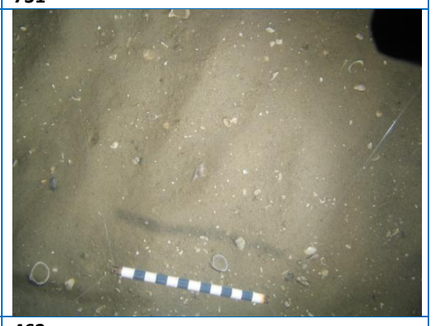
TA_CAM_102					
	538	541	542	539	543
TA_CAM_103					
	747	749	754	748	751
TA_CAM_104					
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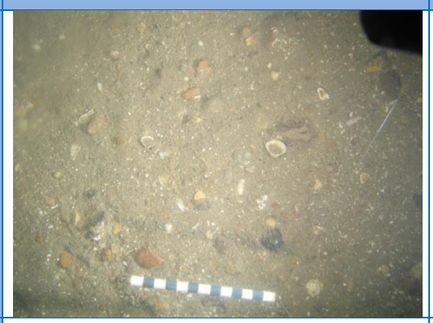
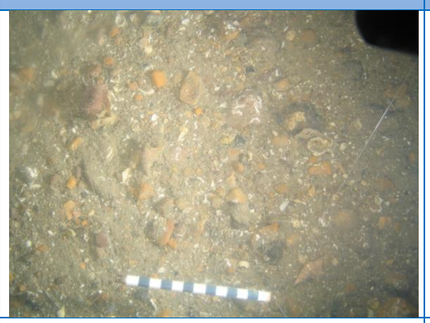
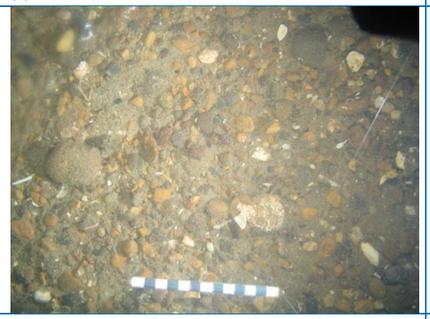
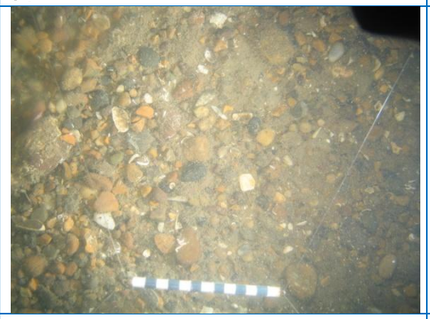
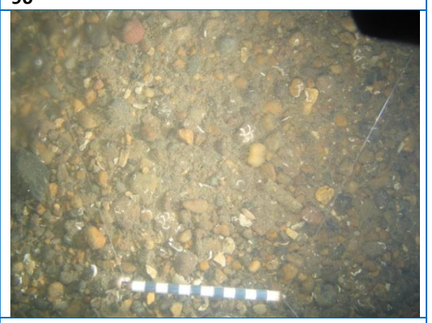
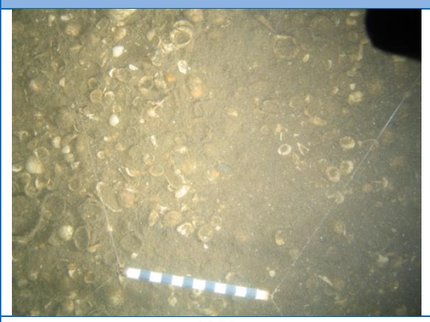
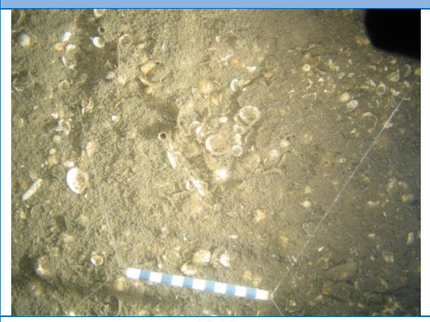
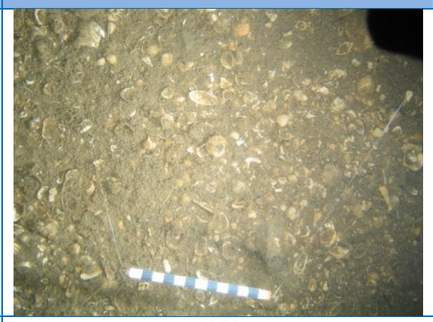
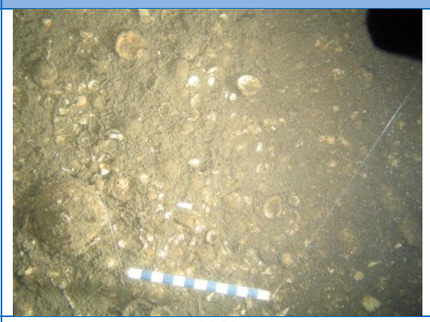
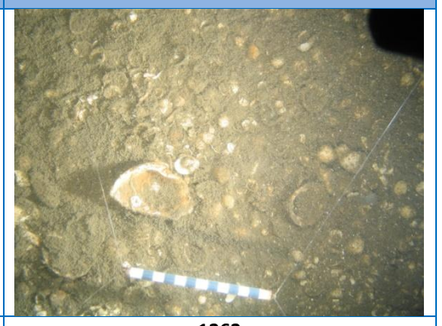
Station ID					
TA_CAM_105					
	92	93	97	94	96
TA_CAM_106					
	26	29	31	27	30

APPENDIX IV OFFSHORE CABLE ROUTE SEABED IMAGES

Dogger Bank R3 Offshore Cable Route and Tranche A Benthic Survey J/1/03/1794

Station ID					
CABA_CAM_01					
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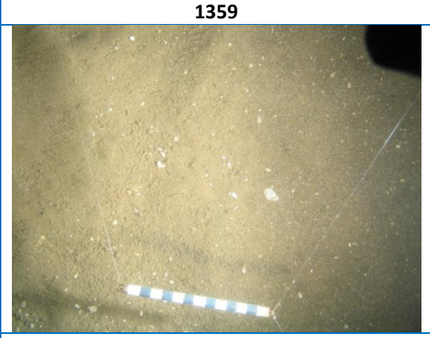
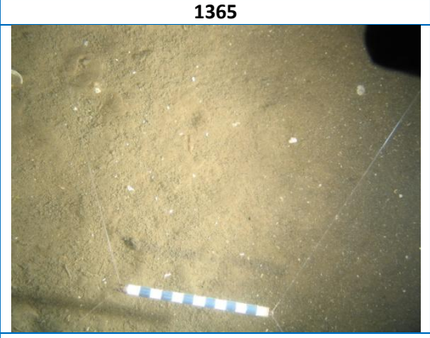
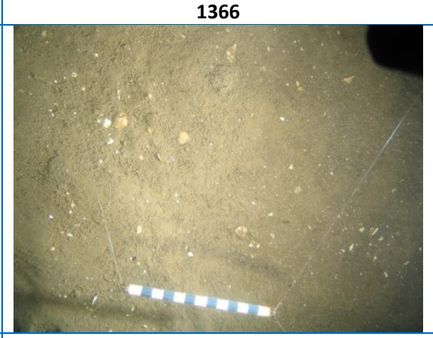
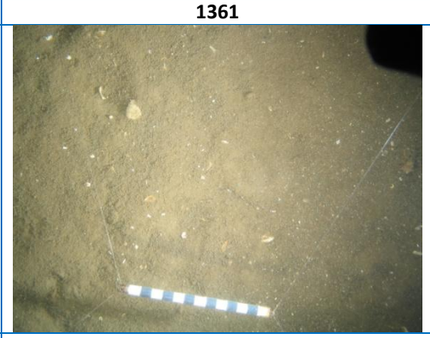
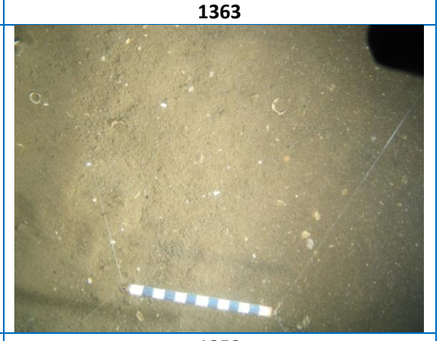
CABA_CAM_02					
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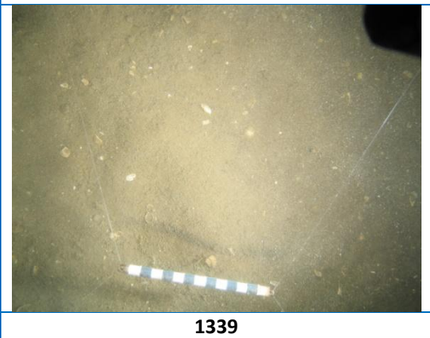
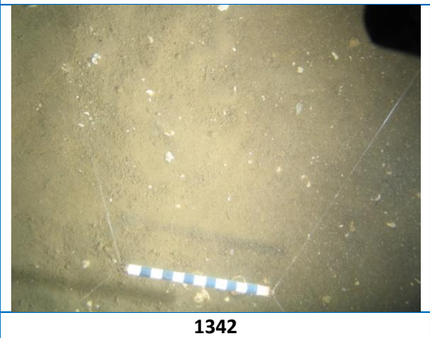
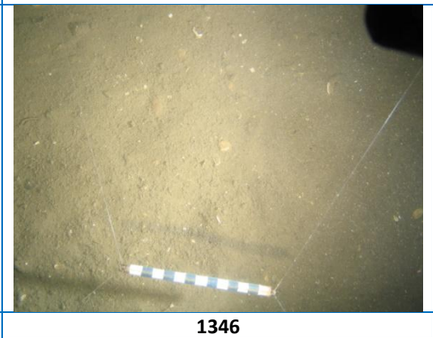
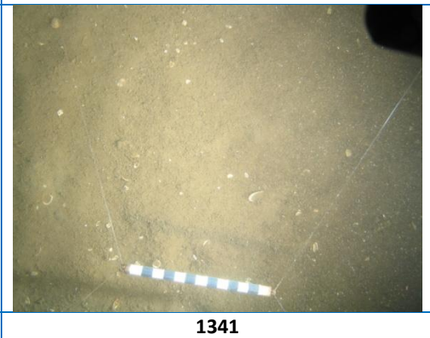
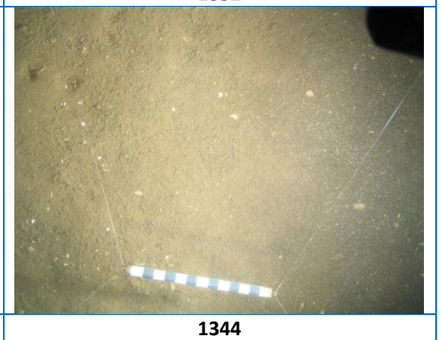
CABA_CAM_03					
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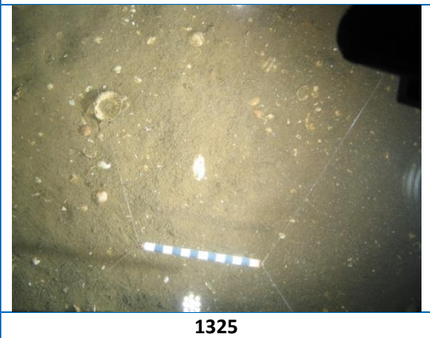
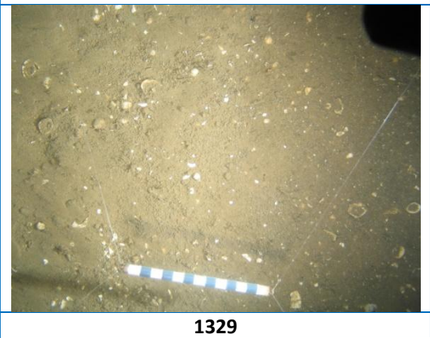
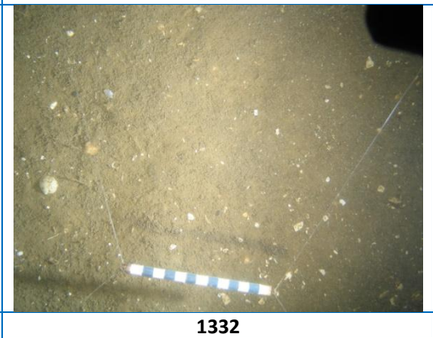
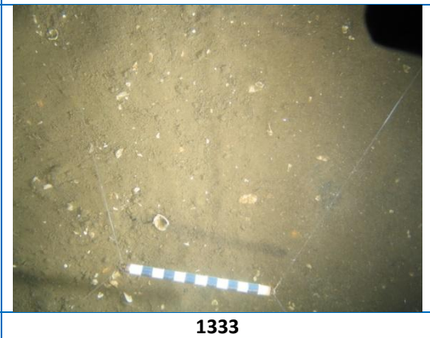
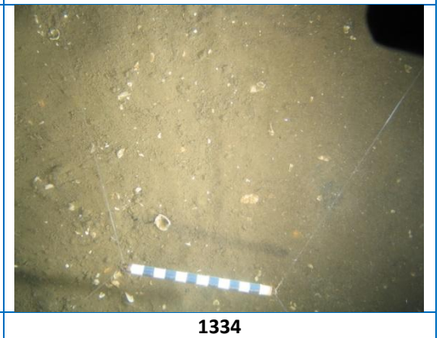
CABA_CAM_04					
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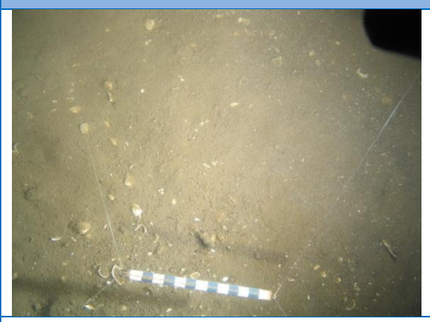
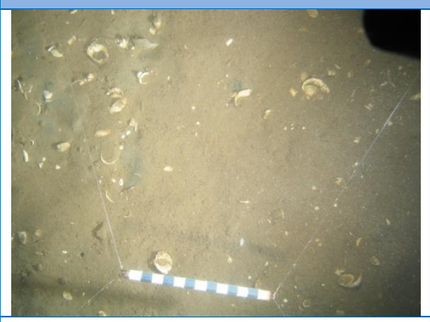
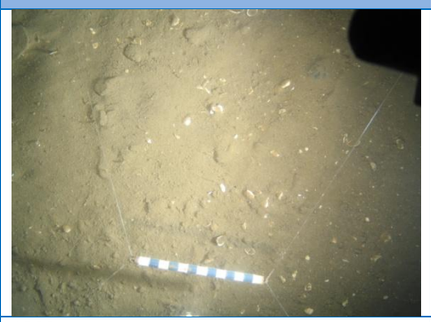
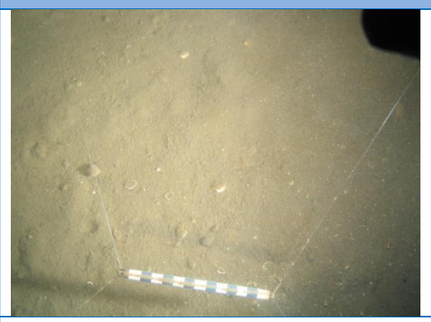
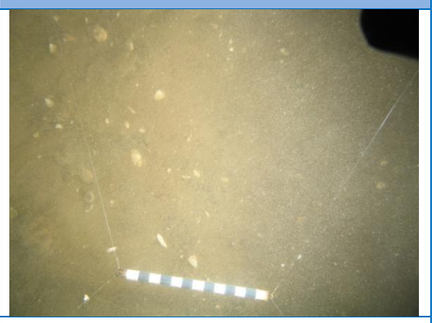
Station ID					
CABA_CAM_05					
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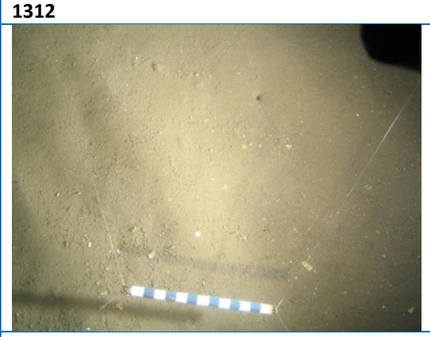
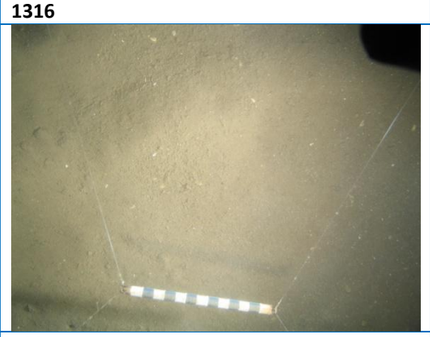
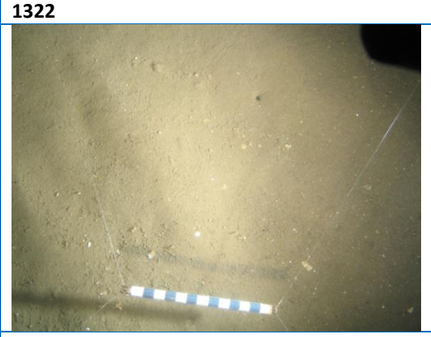
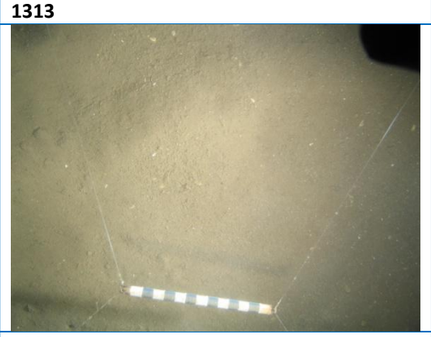
CABA_CAM_06					
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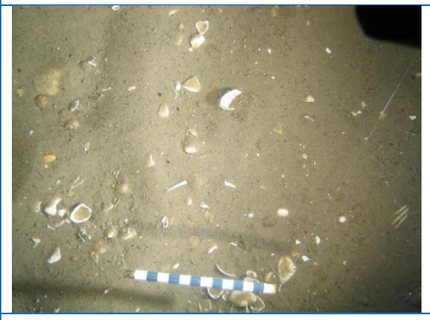
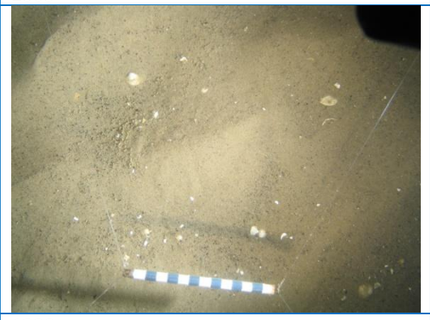
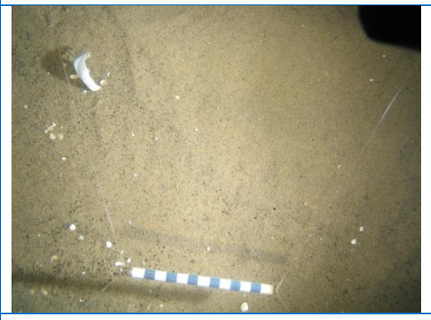
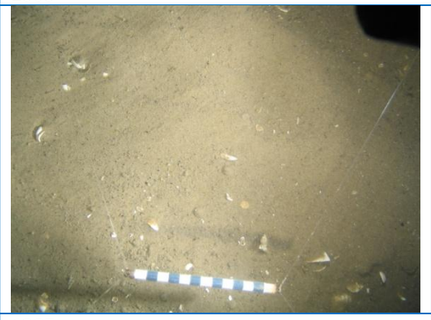
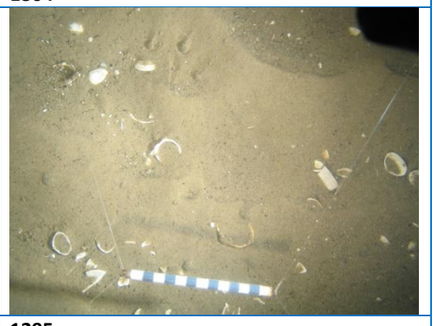
CABA_CAM_07					
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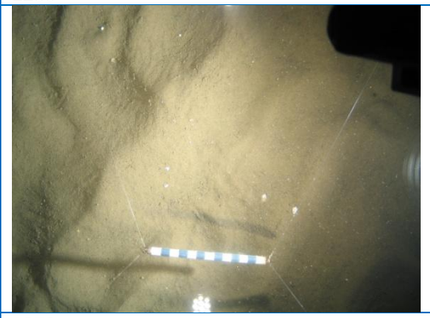
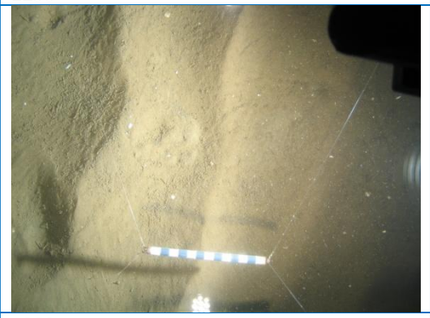
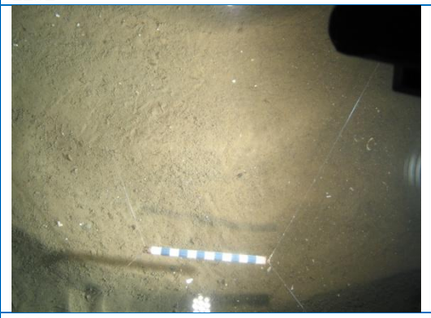
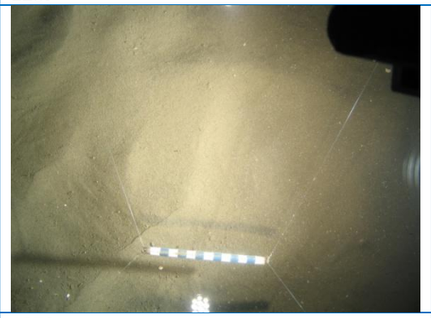
CABA_CAM_08					
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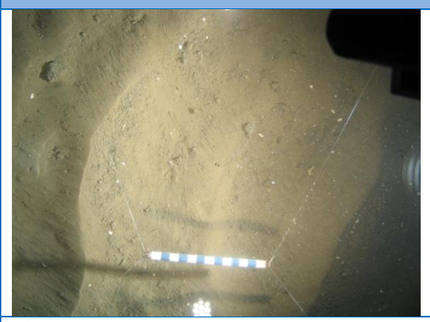
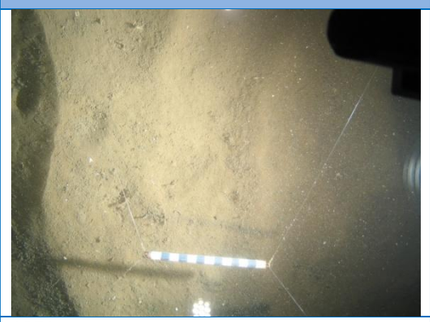
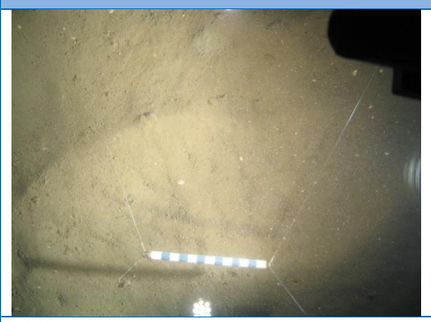
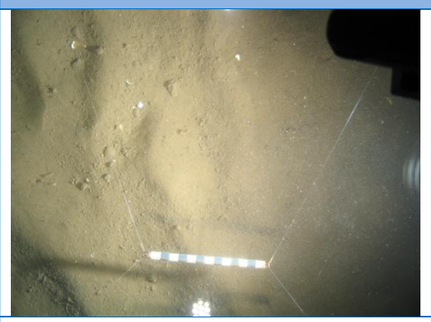
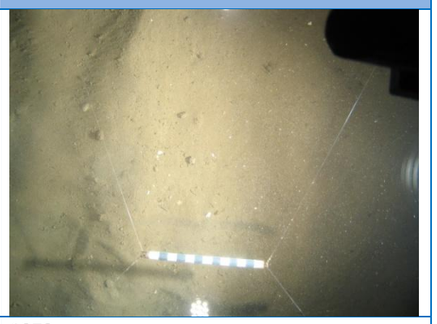
CABA_CAM_09					
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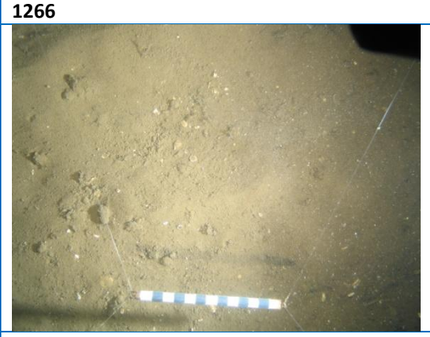
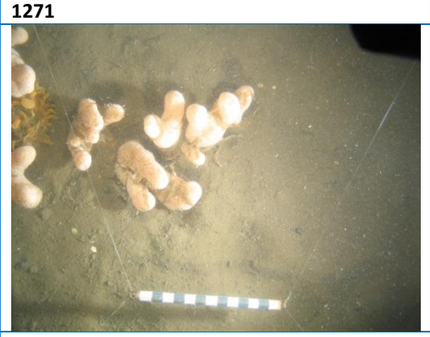
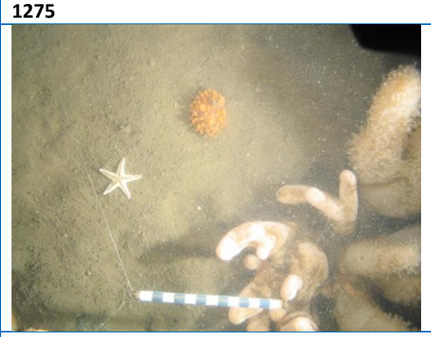
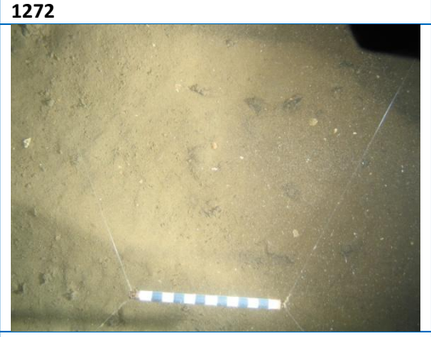
CABA_CAM_10					
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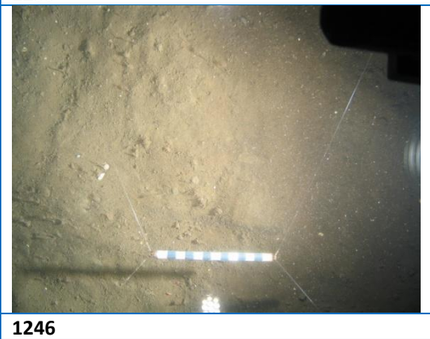
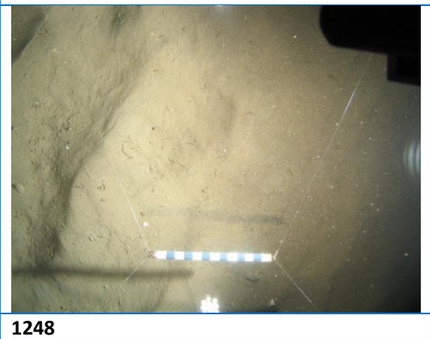
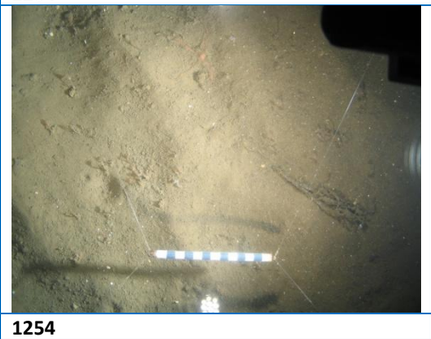
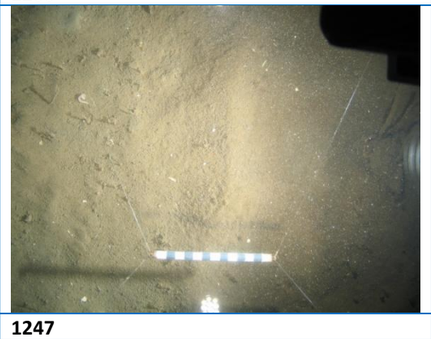
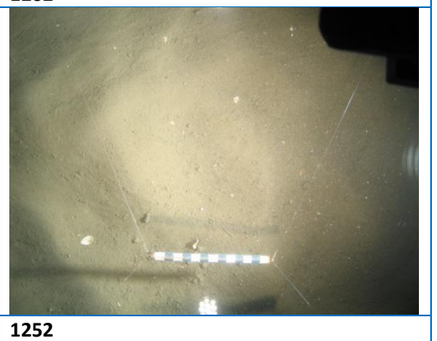
CABA_CAM_11					
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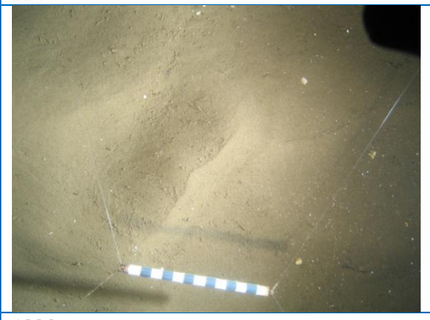
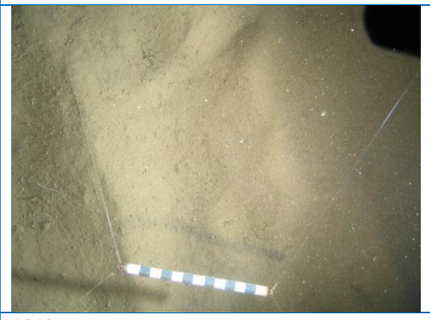
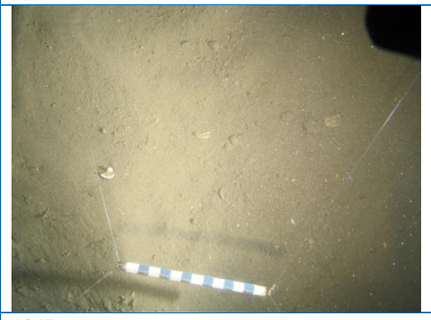
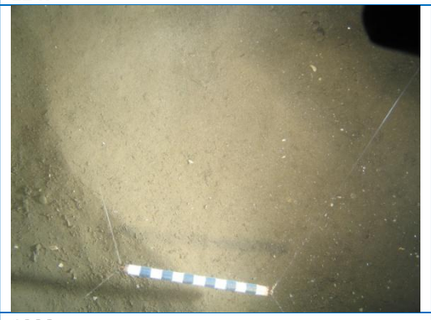
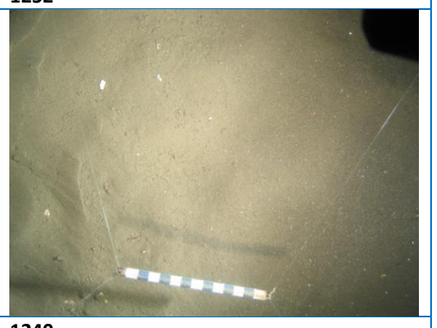
CABA_CAM_12					
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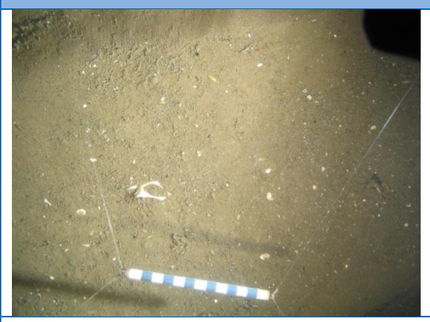
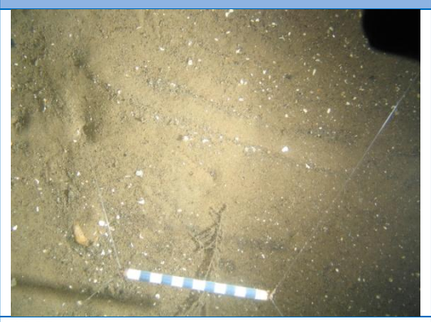
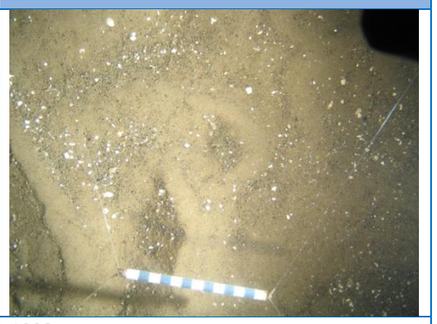
CABA_CAM_13					
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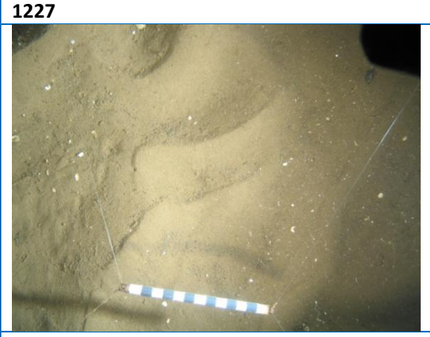
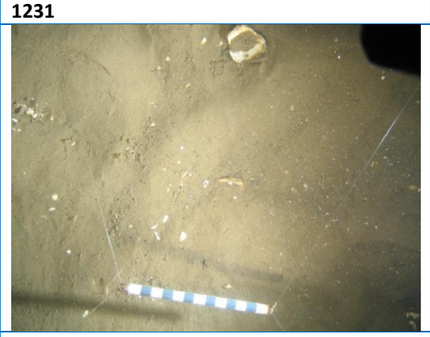
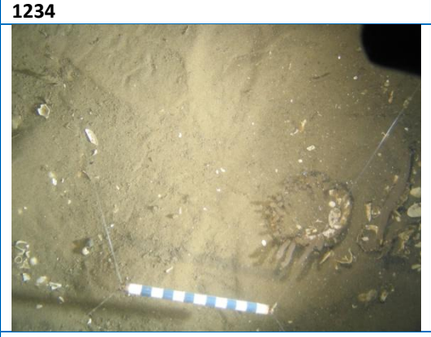
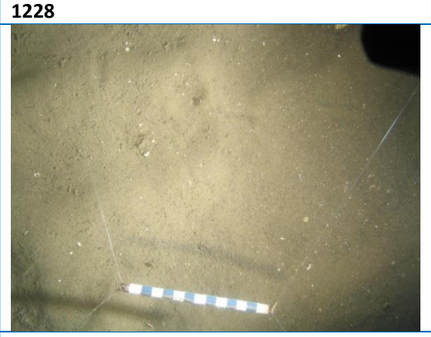
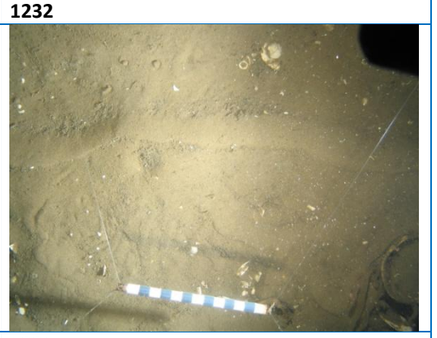
CABA_CAM_14					
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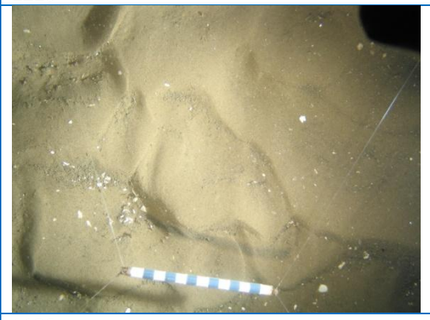
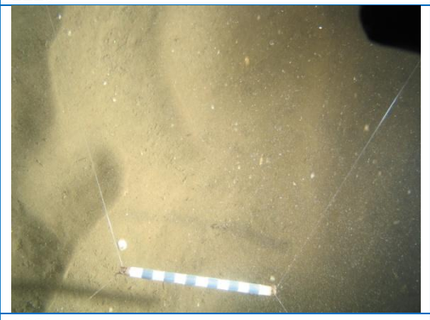
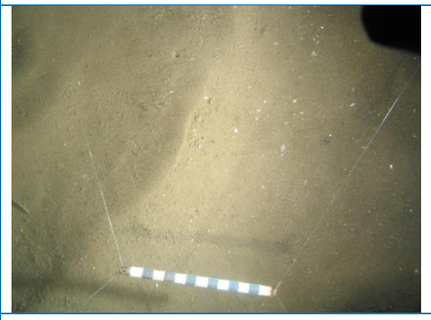
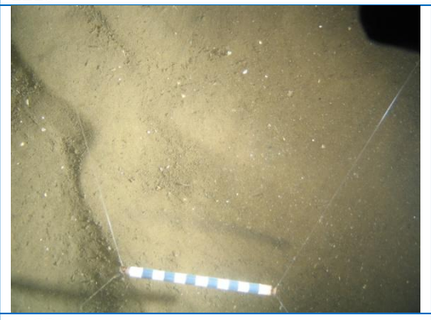
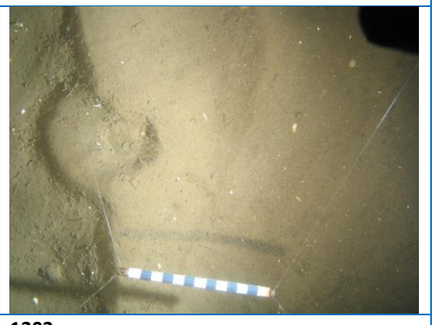
CABA_CAM_15					
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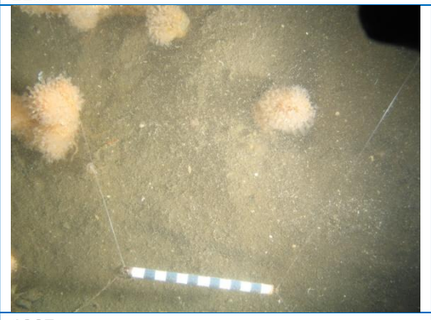
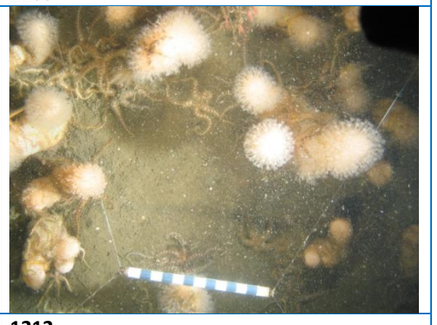
CABA_CAM_16A					
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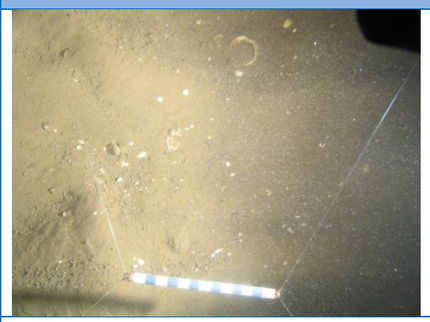
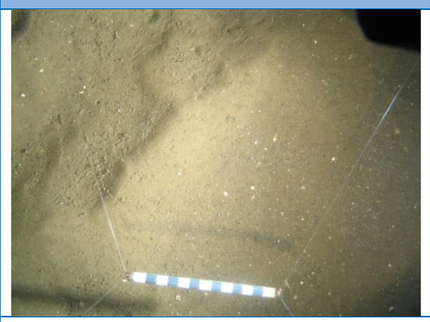
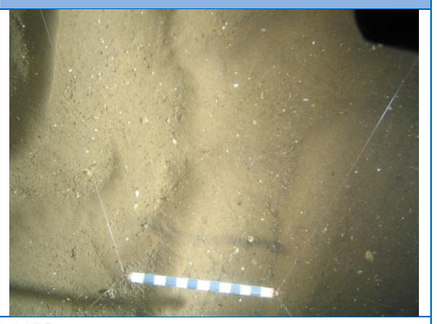
CABA_CAM_17					
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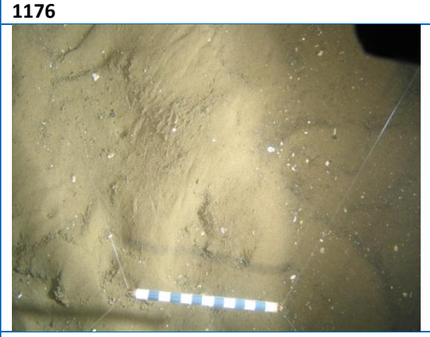
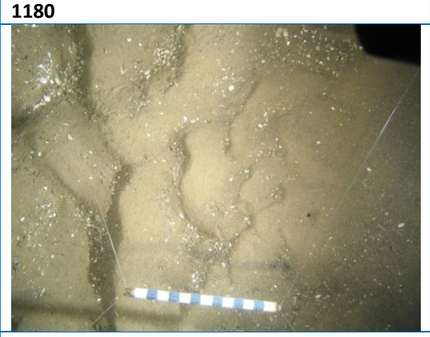
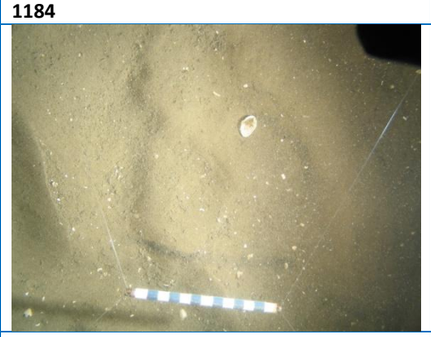
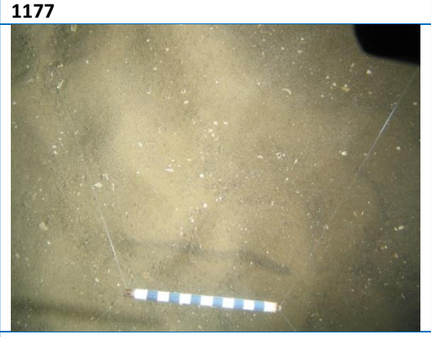
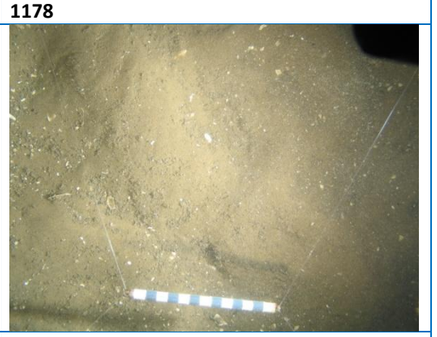
CABA_CAM_18					
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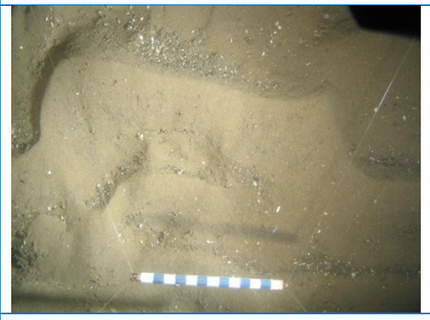
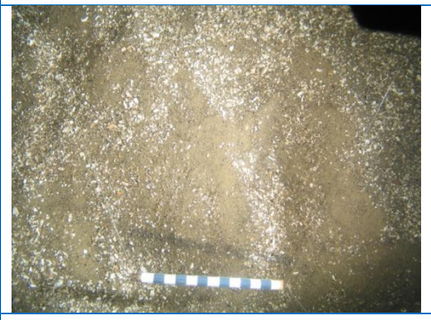
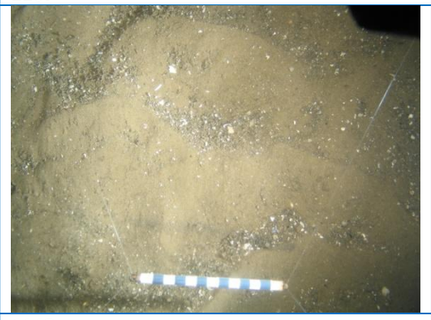
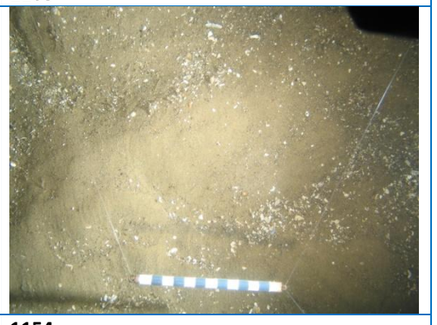
CABA_CAM_19					
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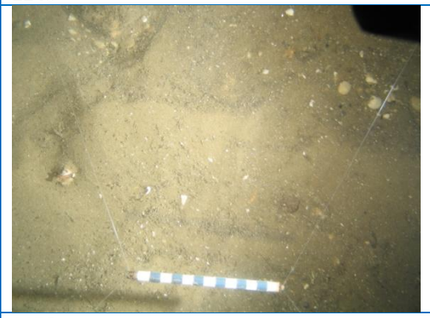
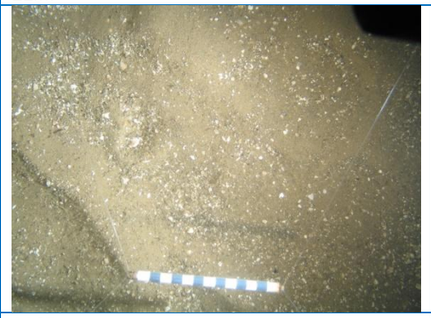
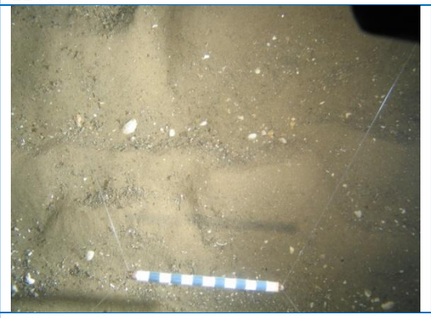
CABA_CAM_20					
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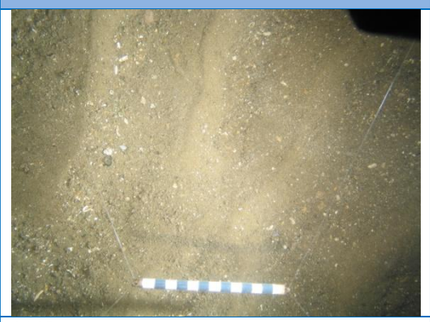
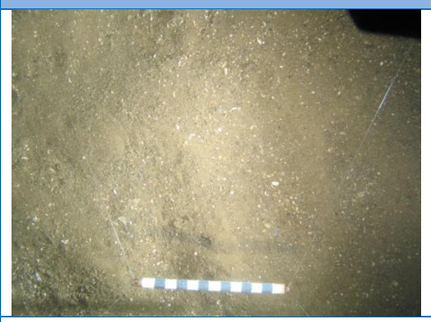
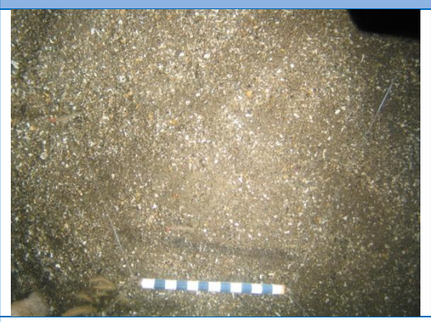
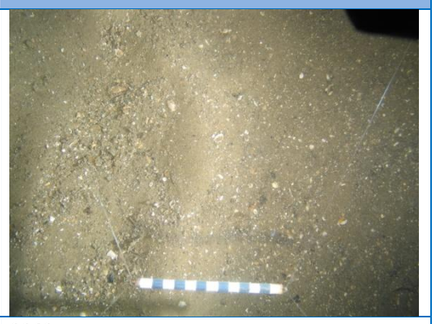
CABA_CAM_21					
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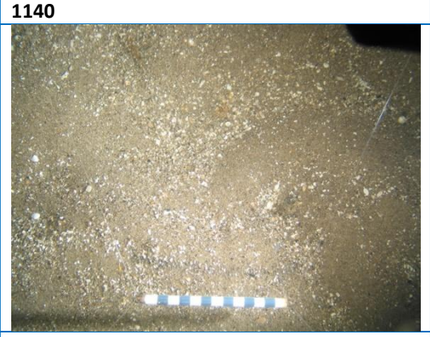
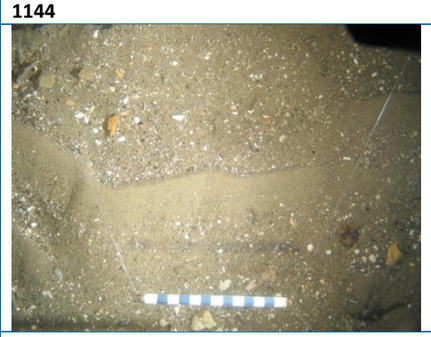
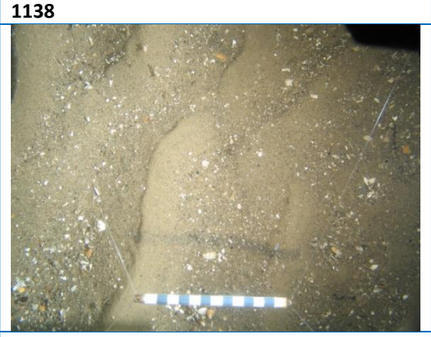
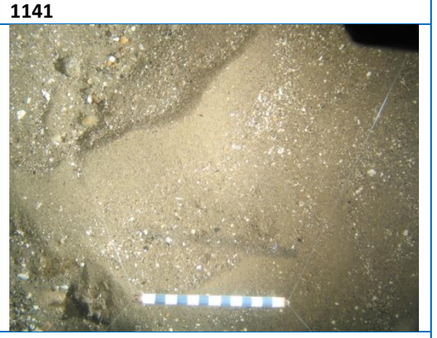
CABA_CAM_22					
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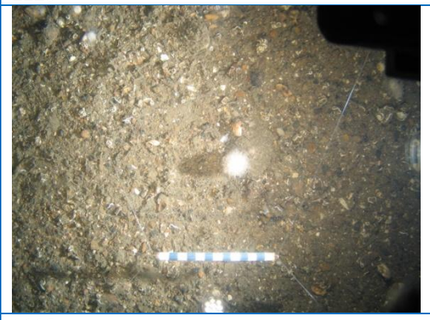
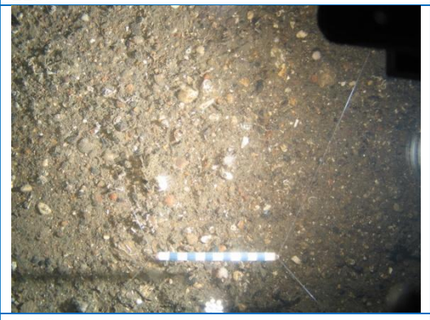
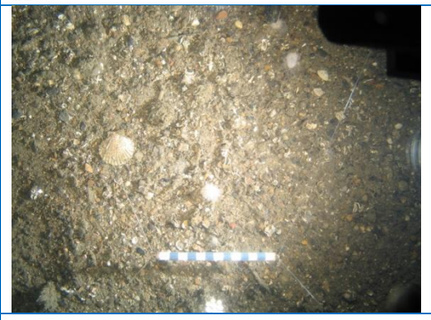
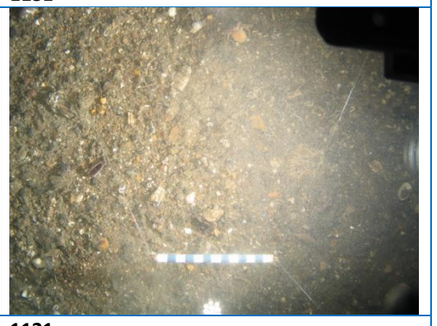
CABA_CAM_23					
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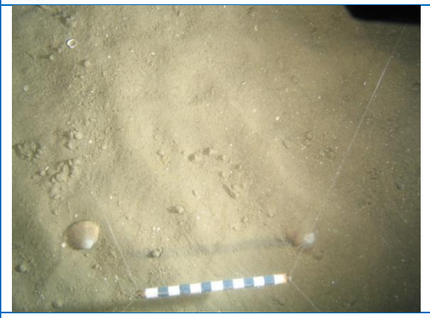
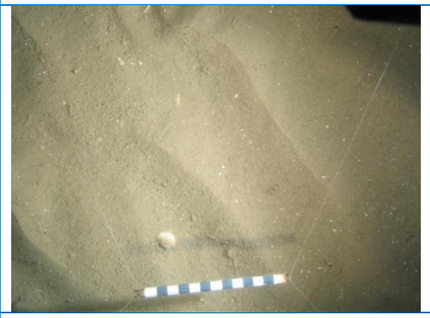
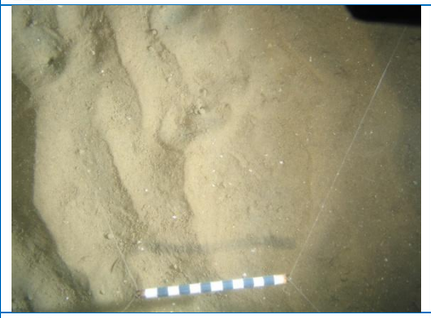
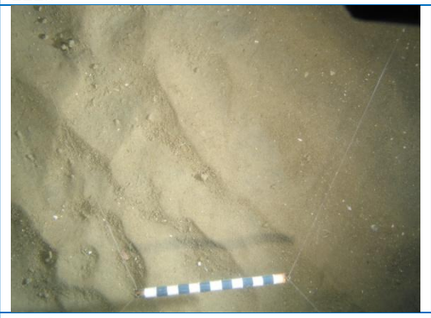
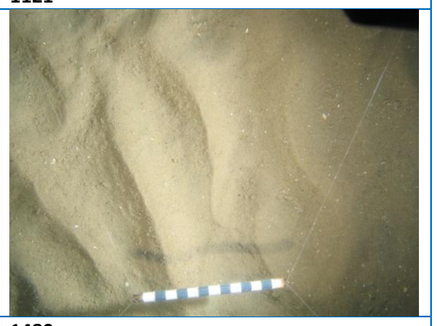
CABA_CAM_24					
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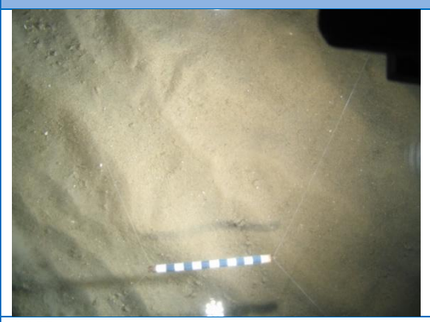
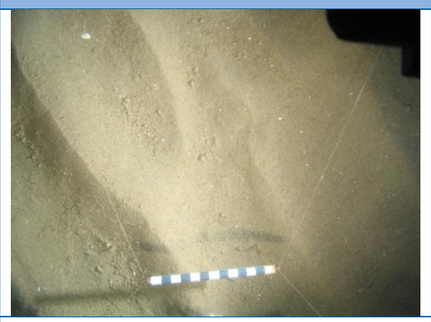
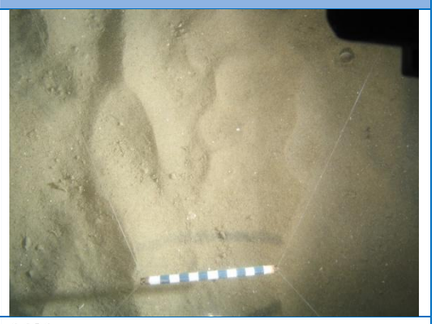
Station ID					
CABA_CAM_25					
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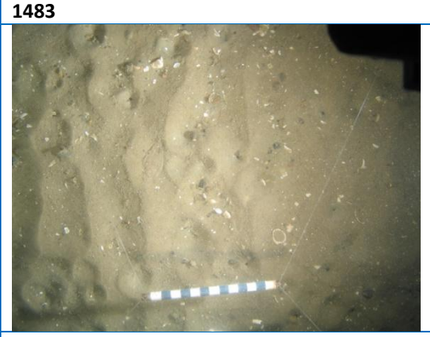
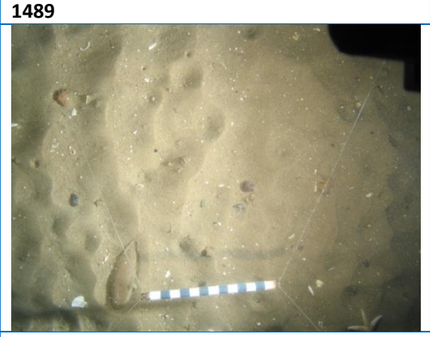
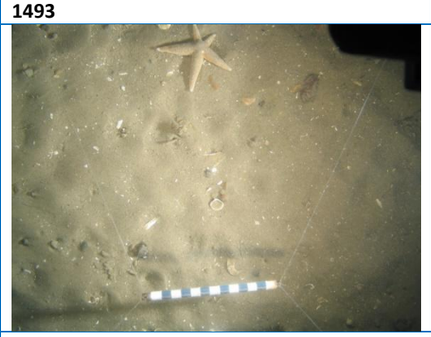
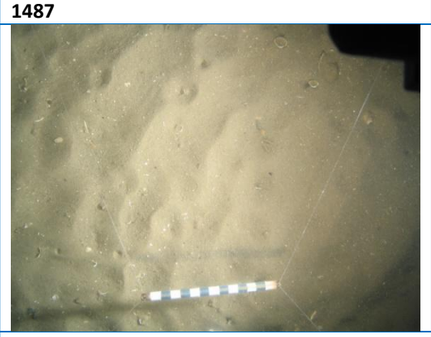
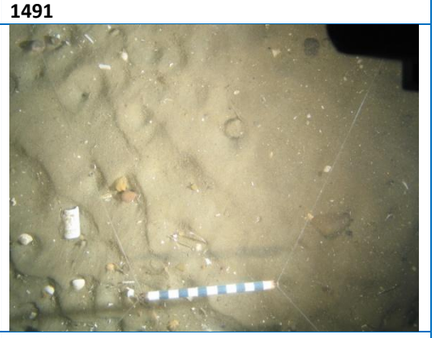
CABA_CAM_26					
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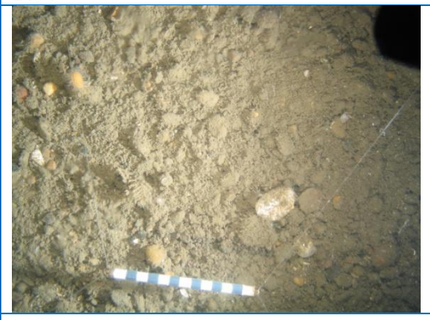
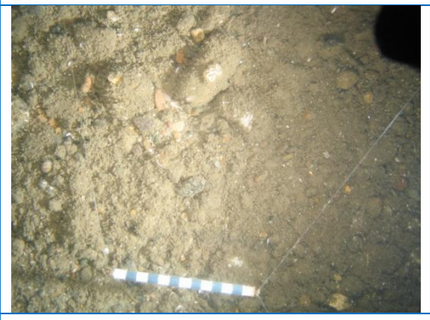
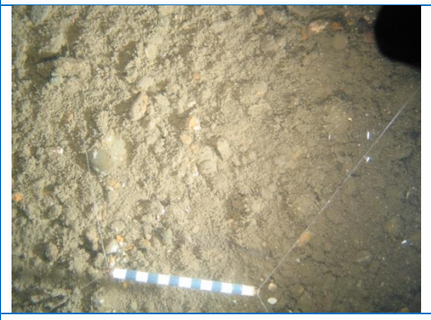
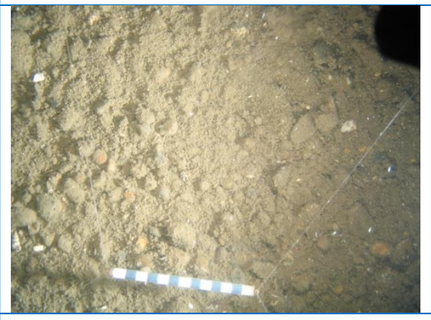
CABA_CAM_27					
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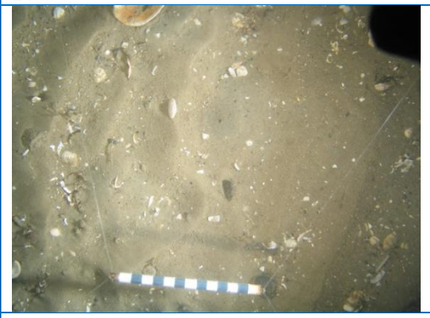
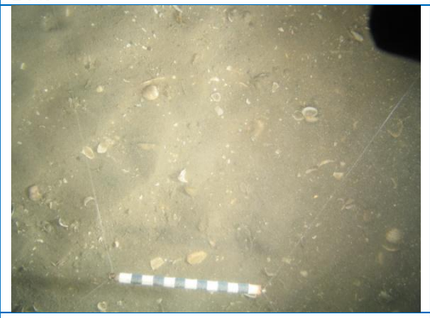
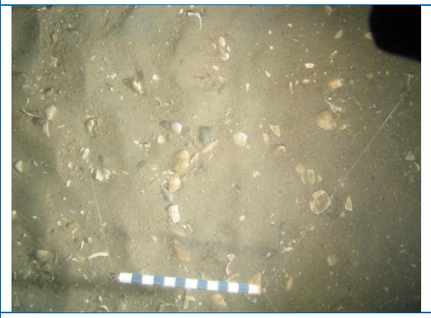
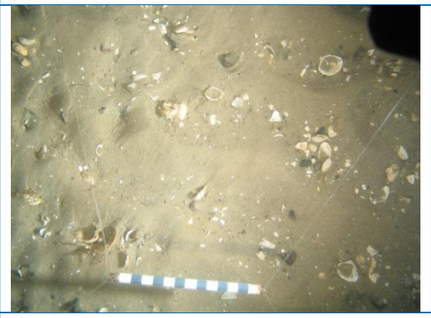
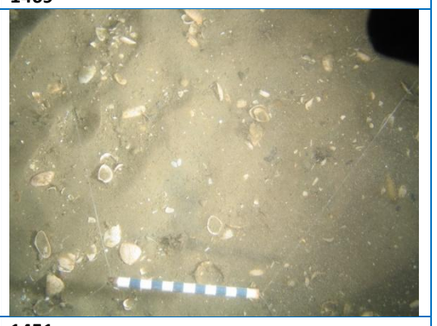
CABA_CAM_28					
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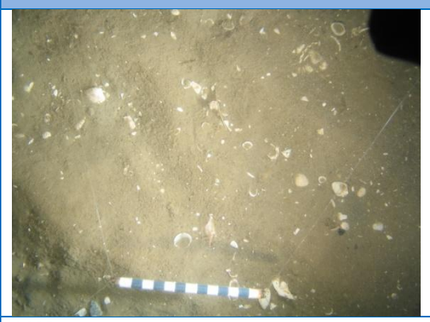
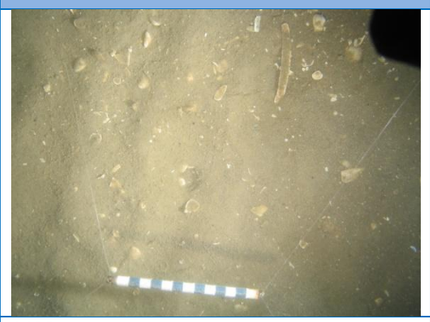
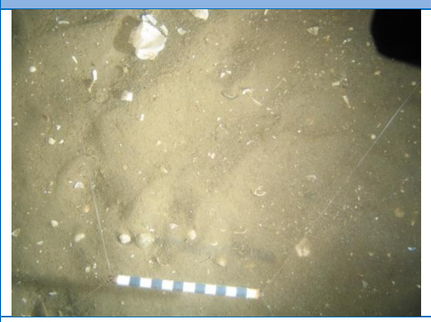
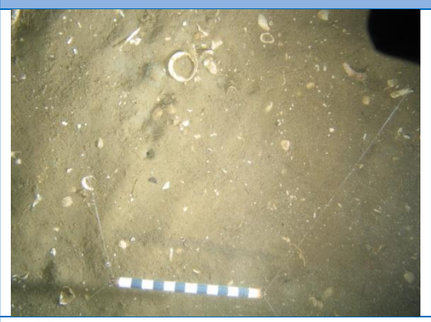
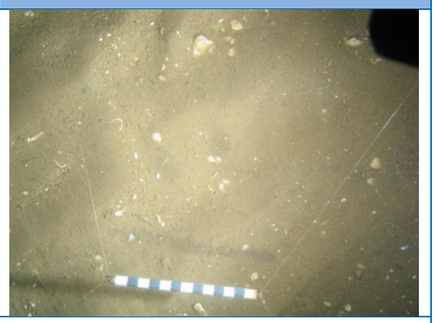
Station ID					
CABA_CAM_29					
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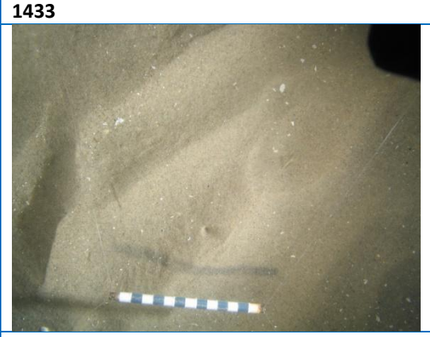
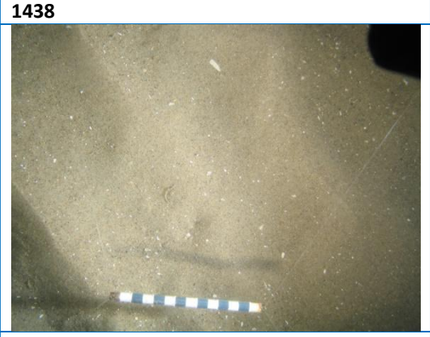
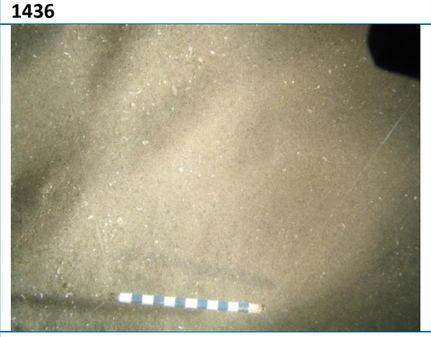
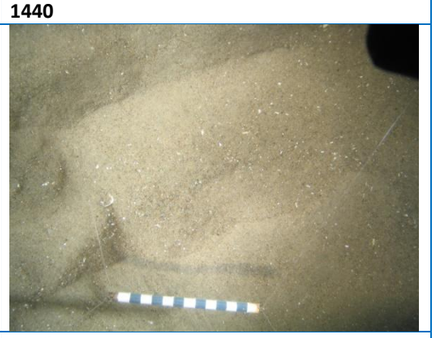
CABA_CAM_30					
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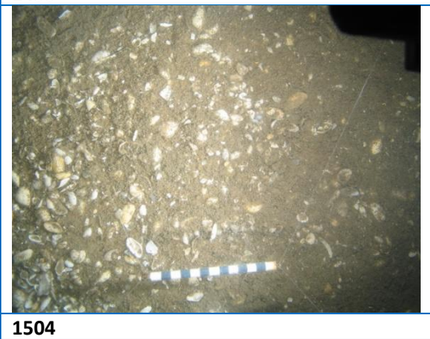
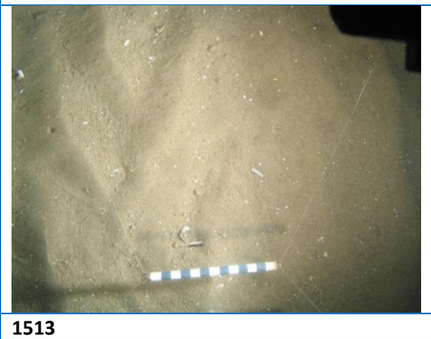
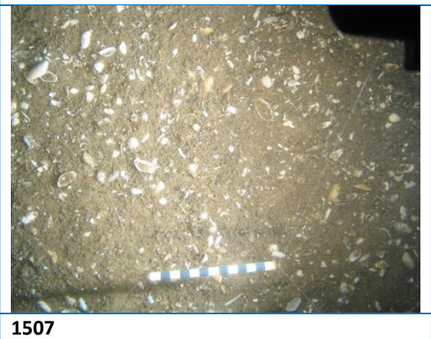
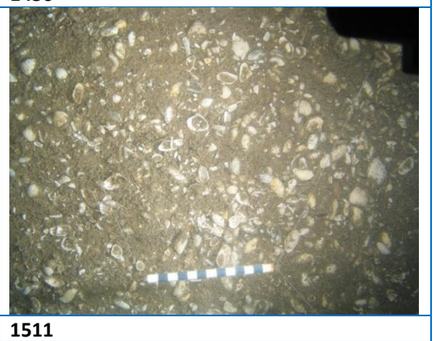
CABA_CAM_31					
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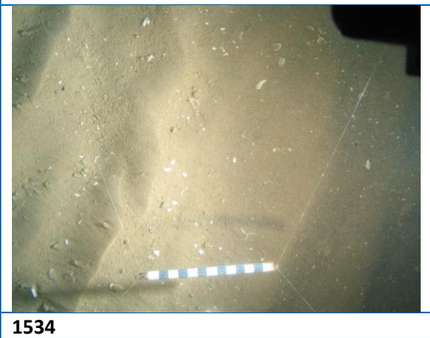
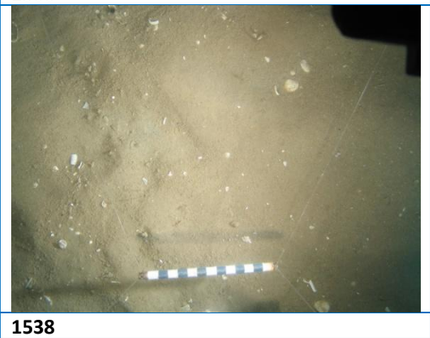
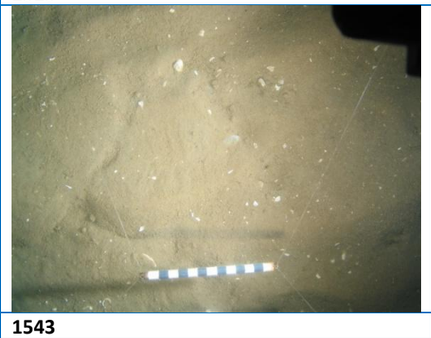
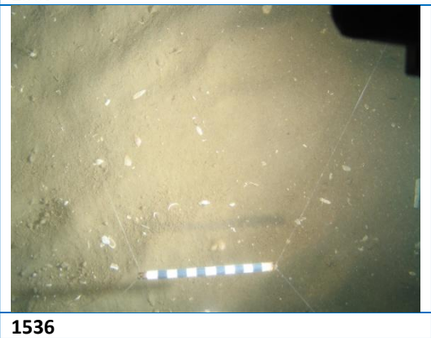
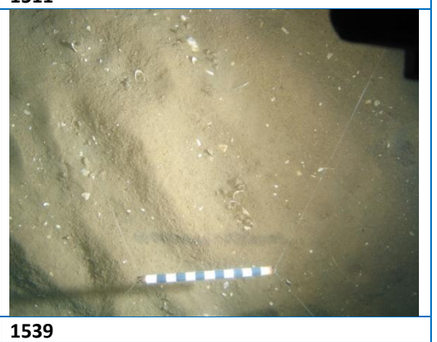
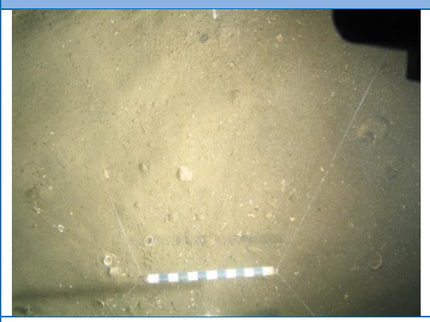
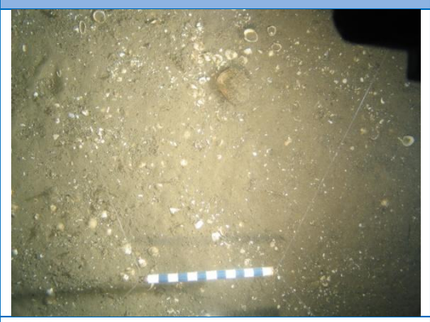
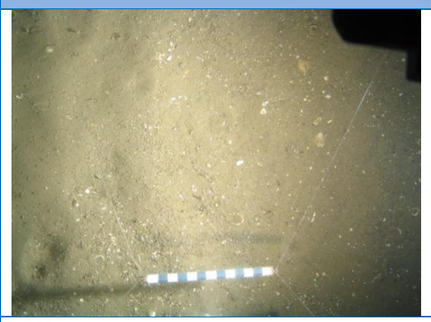
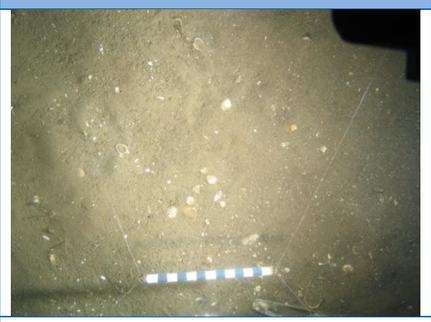
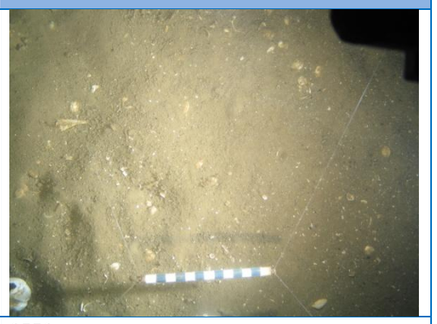
CABA_CAM_32					
	1534	1538	1543	1536	1539

Station ID					
CABA_CAM_33					
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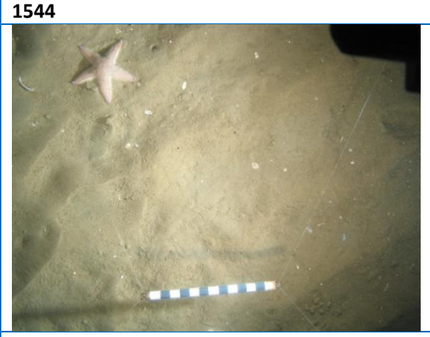
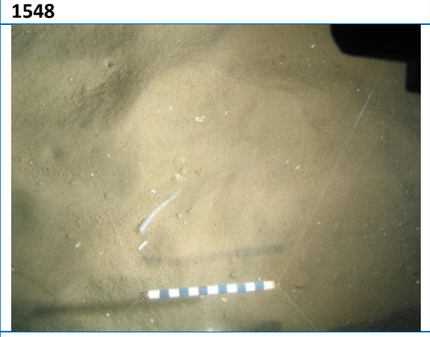
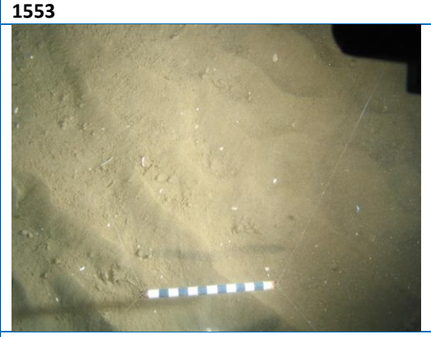
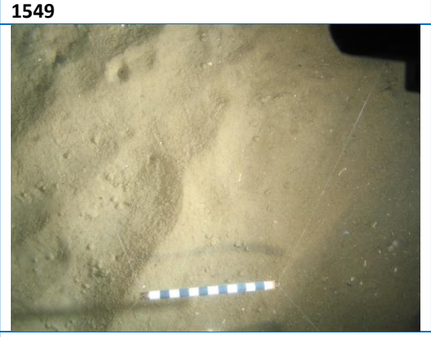
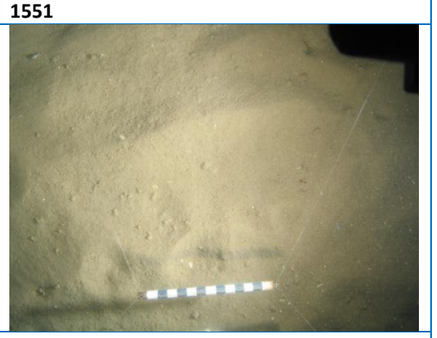
CABA_CAM_34					
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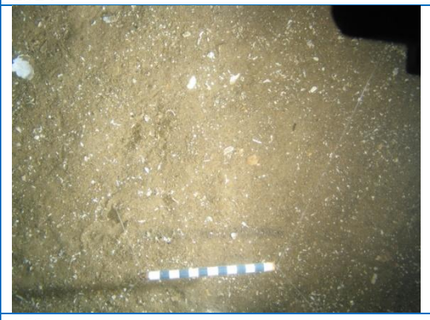
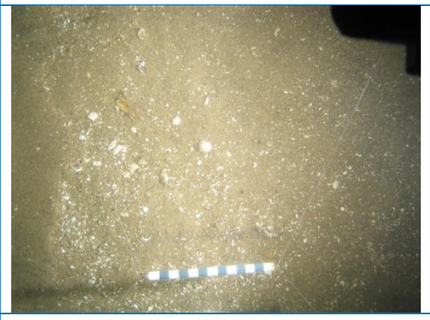
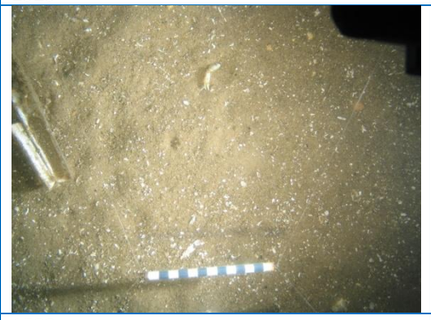
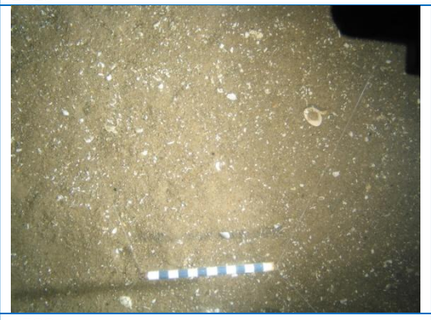
CABA_CAM_35					
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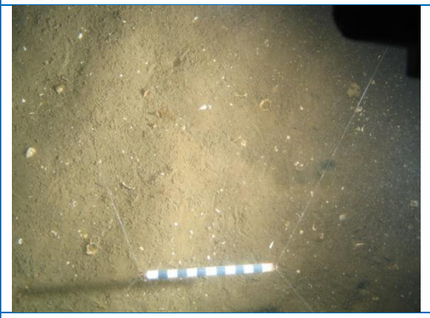
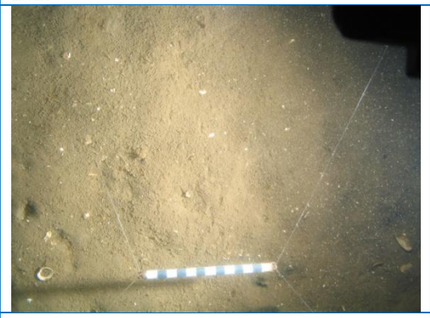
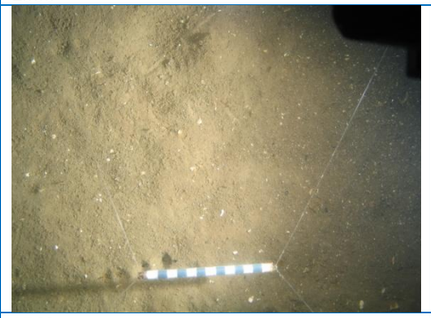
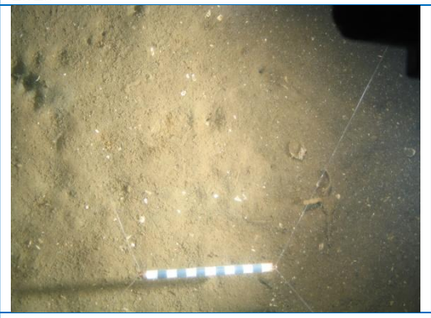
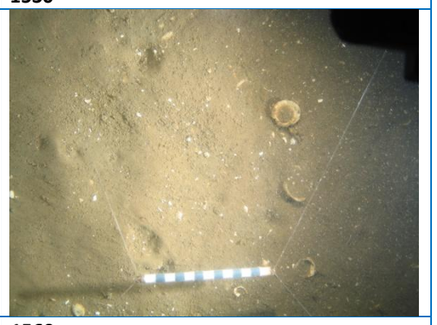
CABA_CAM_36					
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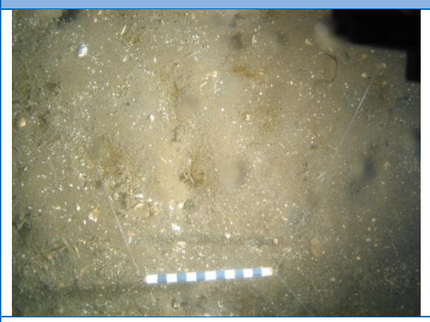
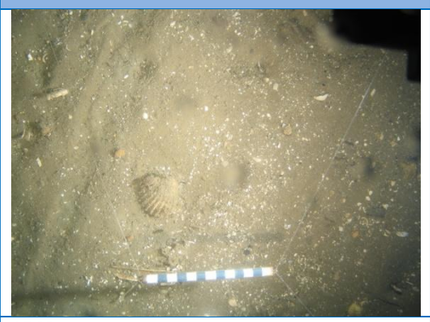
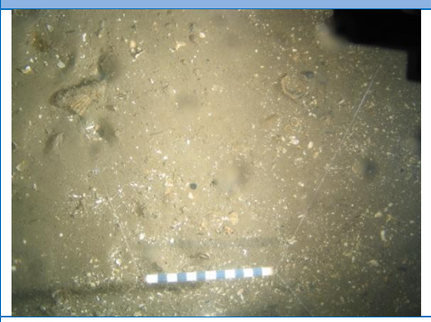
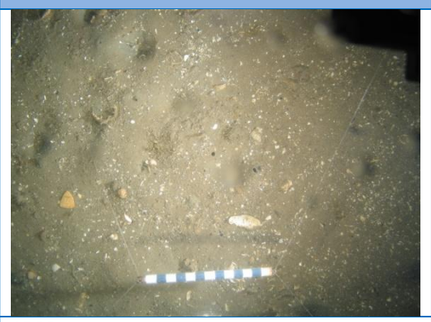
Station ID					
CABA_CAM_37					
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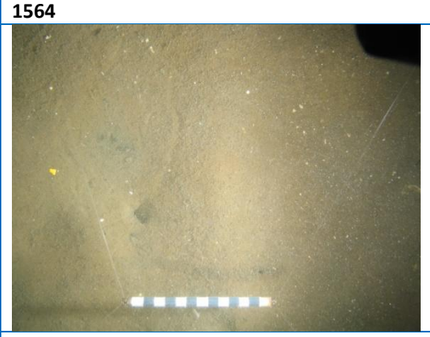
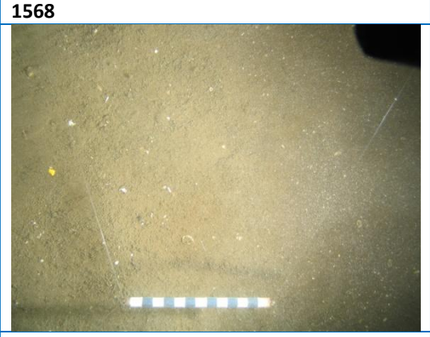
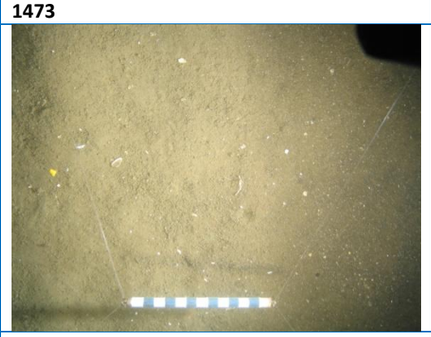
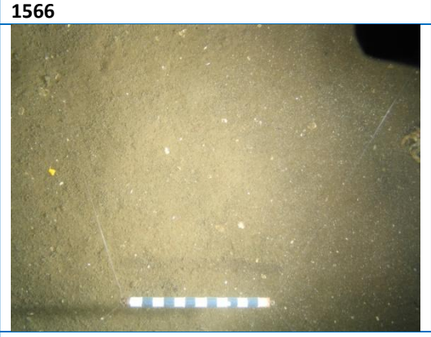
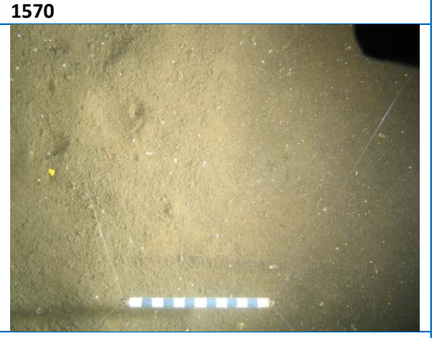
CABA_CAM_38					
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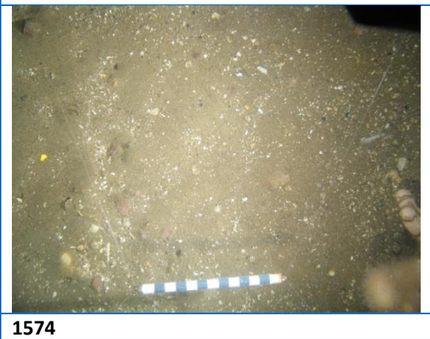
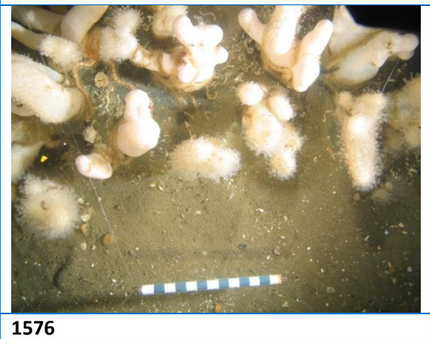
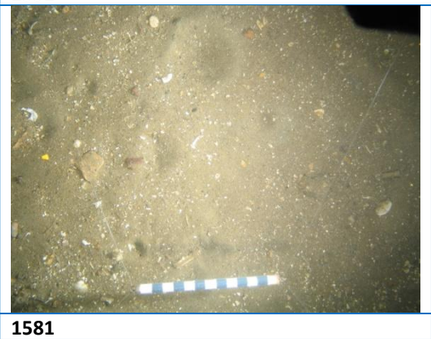
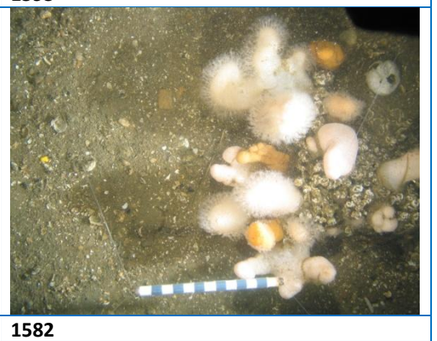
CABA_CAM_39					
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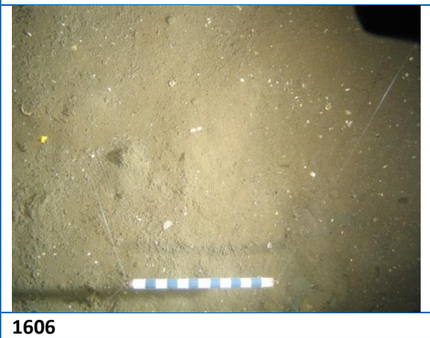
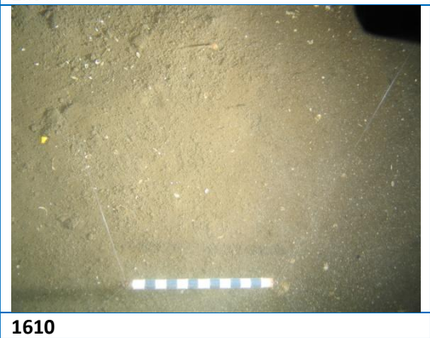
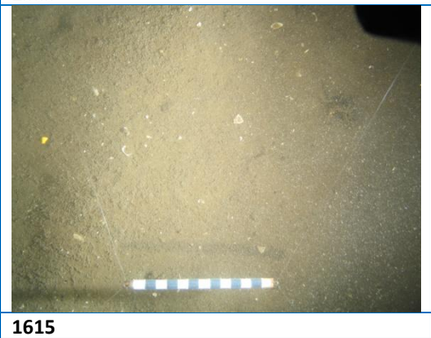
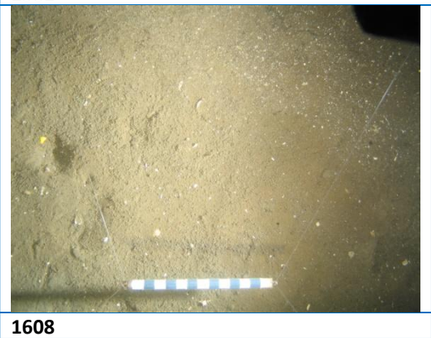
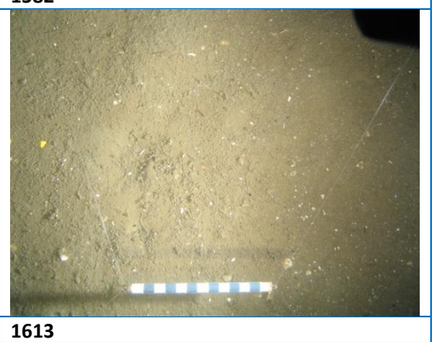
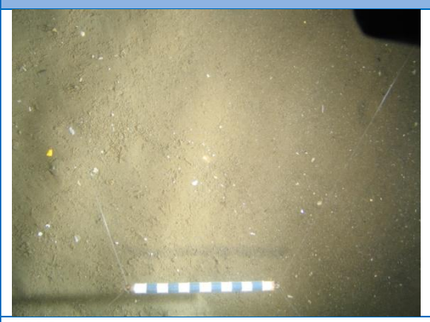
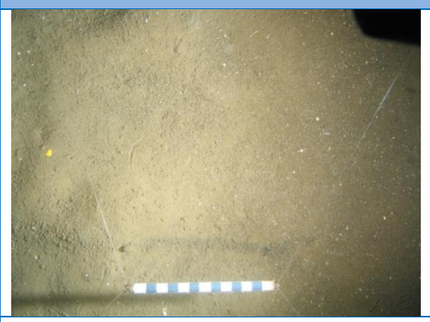
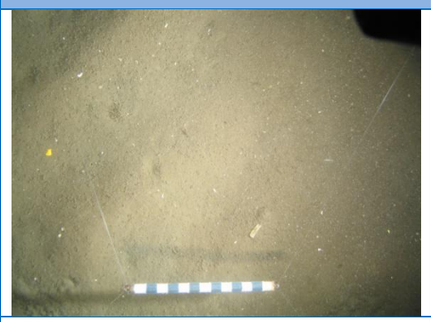
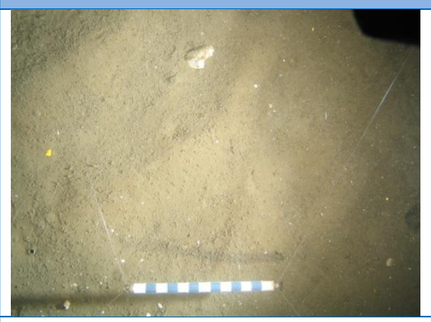
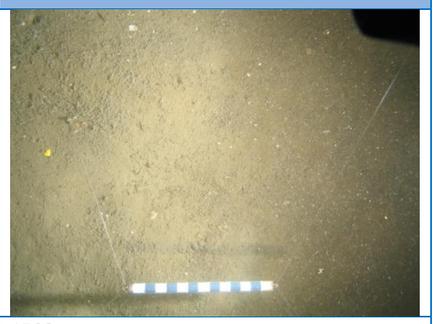
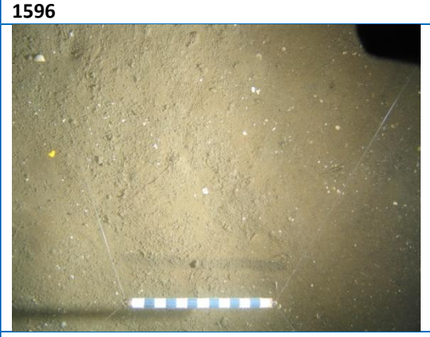
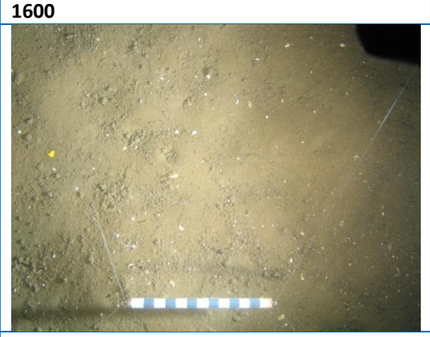
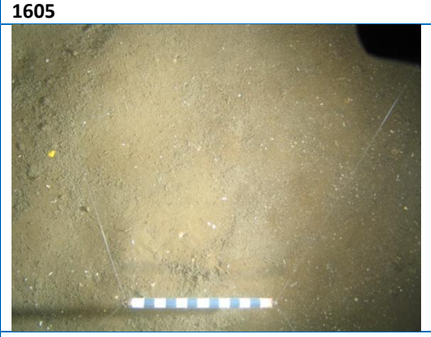
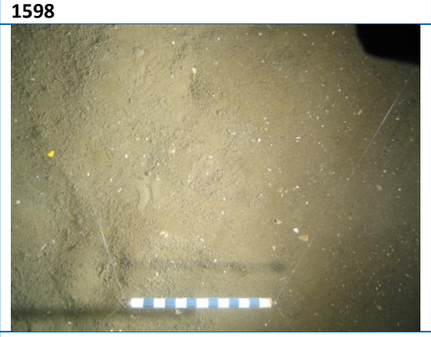
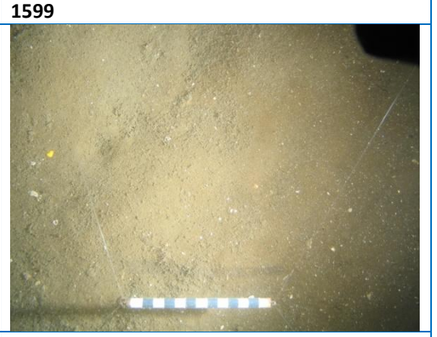
CABA_CAM_40					
	1606	1610	1615	1608	1613

Station ID					
CABA_CAM_41					
	1596	1600	1605	1598	1599
CABA_CAM_42					
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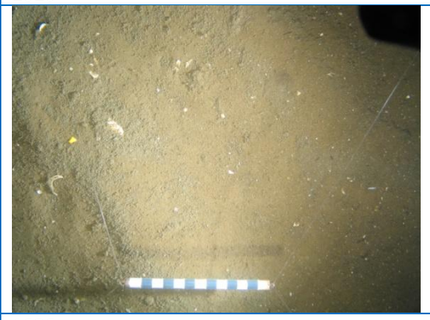
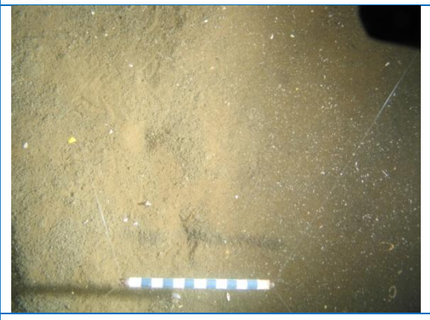
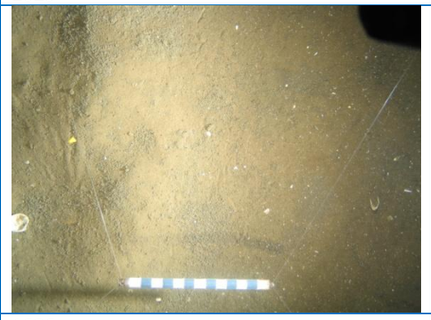
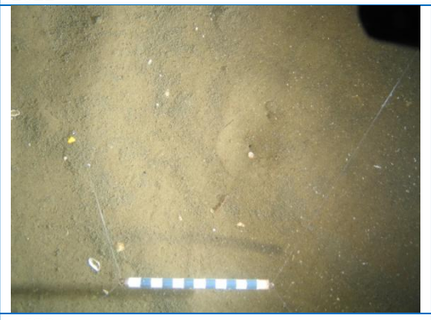
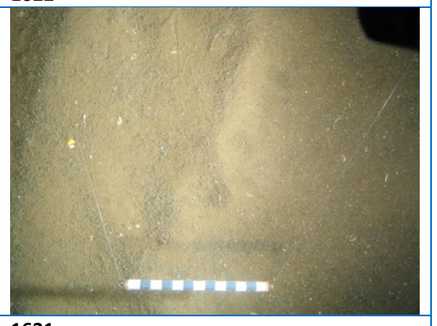
CABA_CAM_43					
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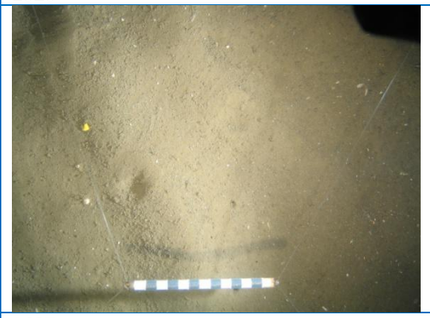
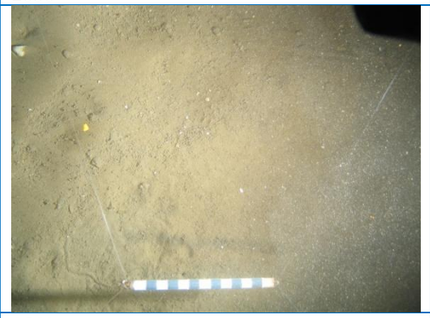
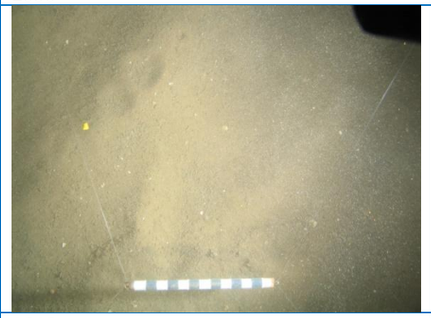
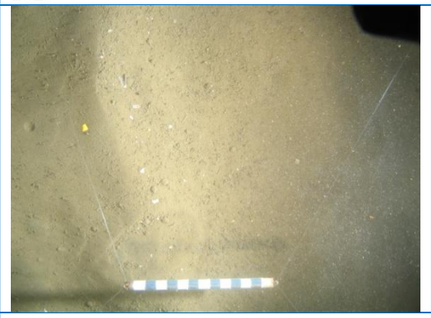
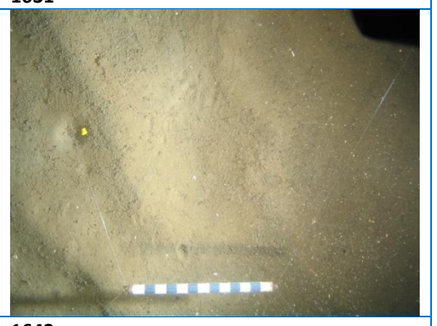
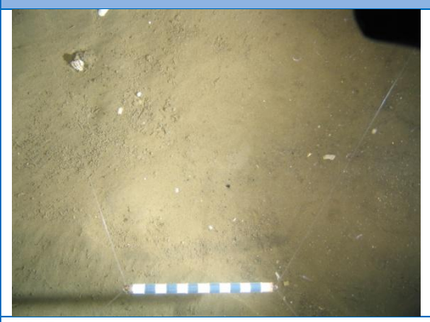
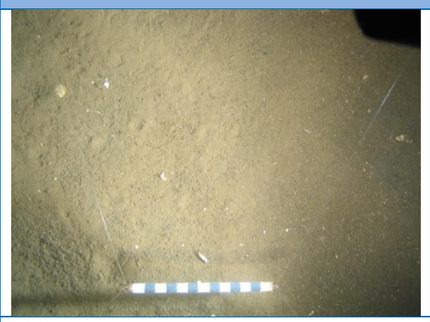
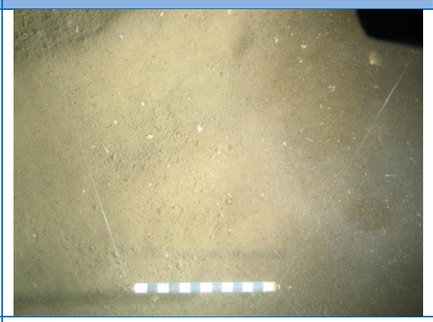
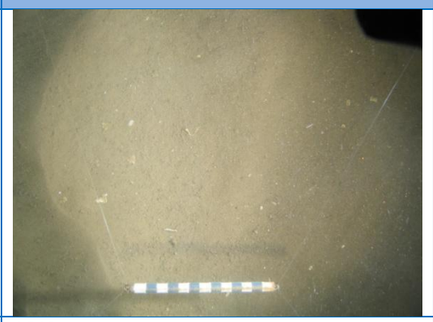
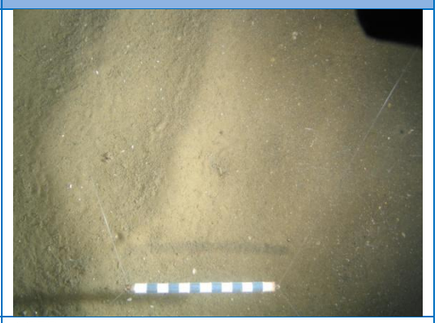
CABA_CAM_44					
	1637	1641	1646	1642	1643

Station ID					
CABA_CAM_45					
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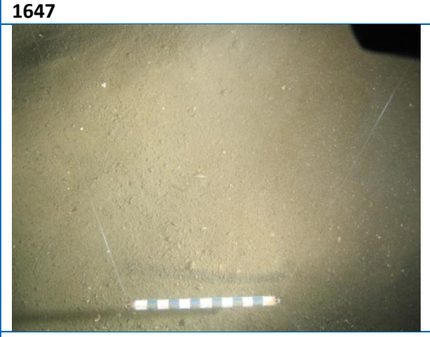
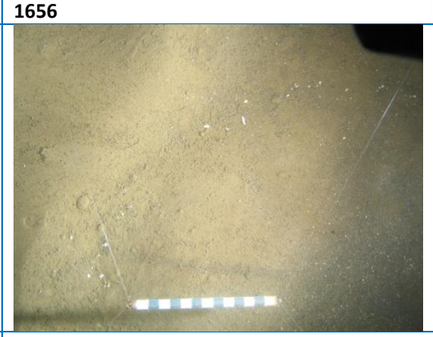
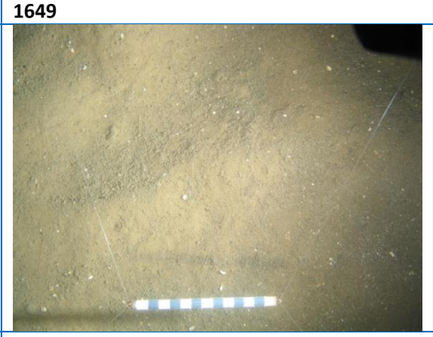
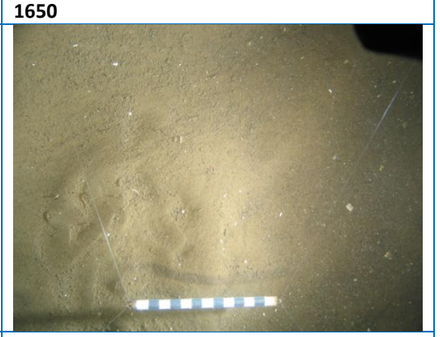
CABA_CAM_46					
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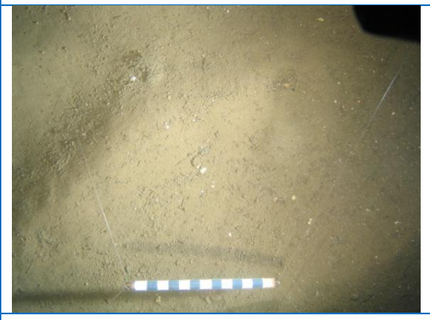
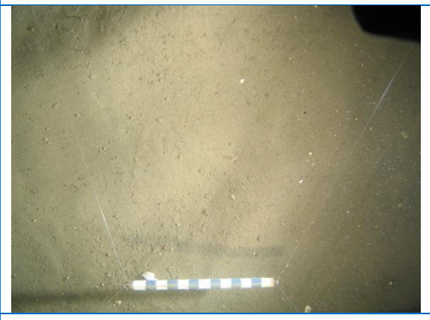
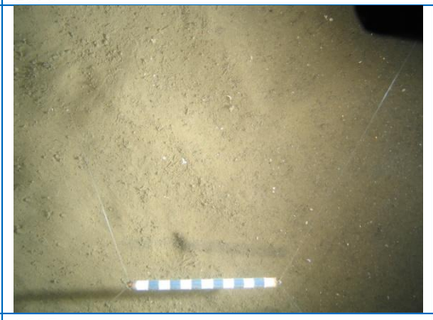
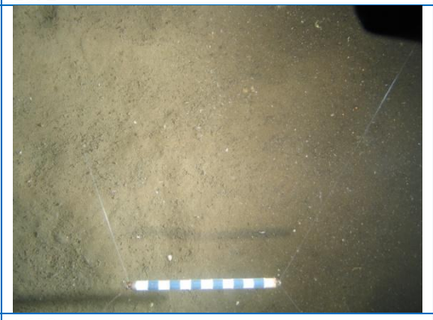
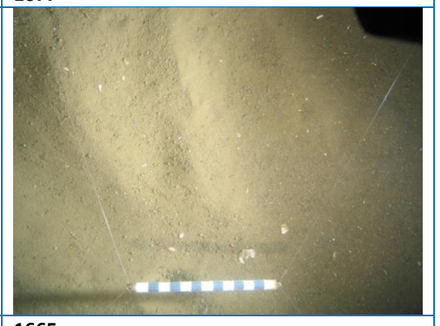
CABA_CAM_47					
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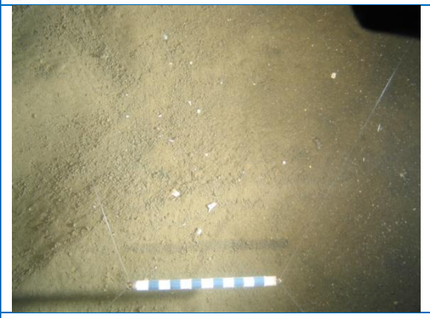
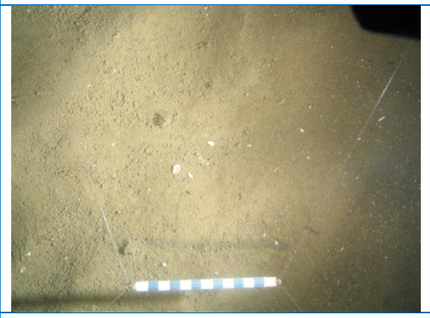
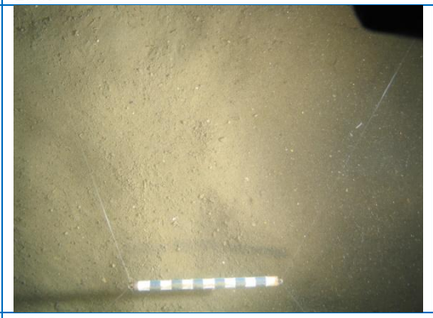
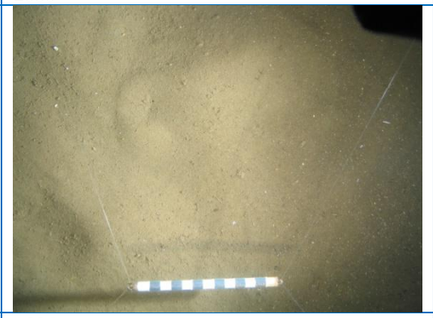
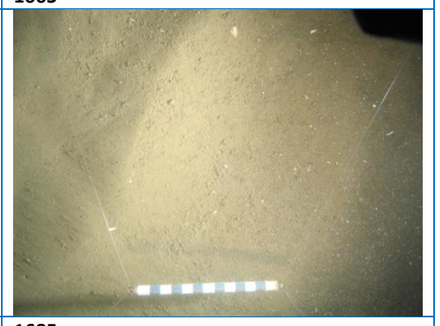
CABA_CAM_48					
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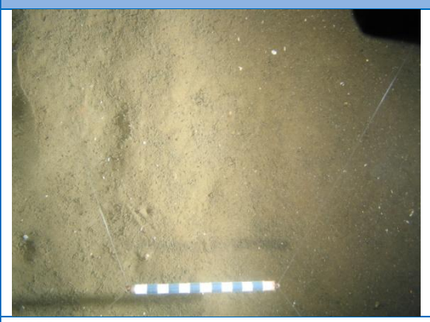
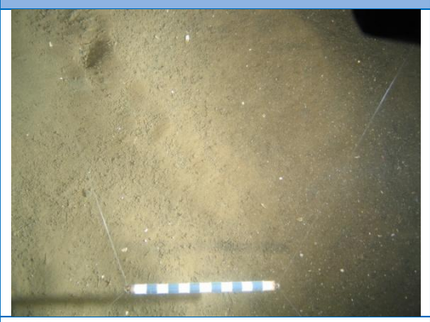
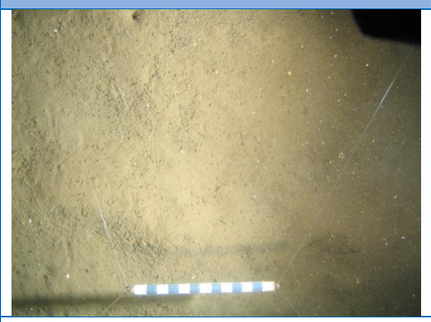
CABA_CAM_49					
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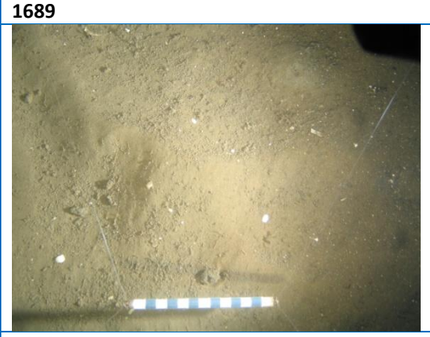
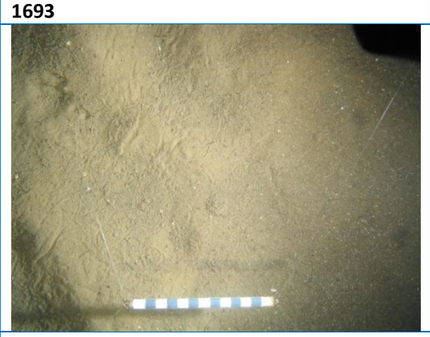
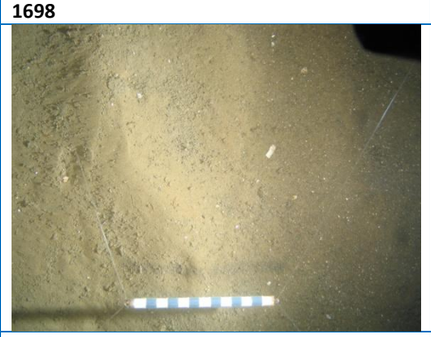
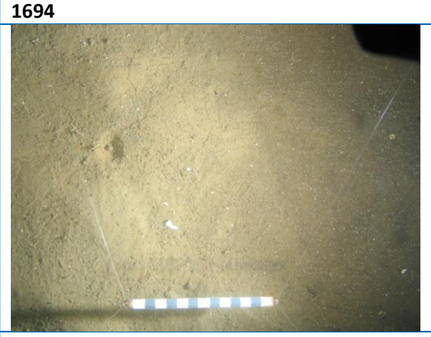
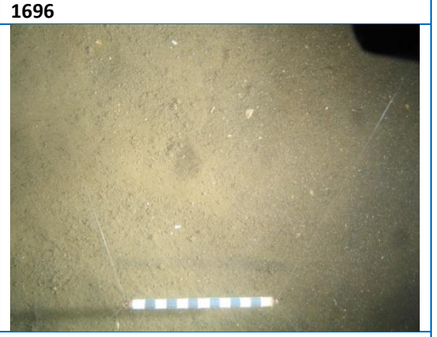
CABA_CAM_50					
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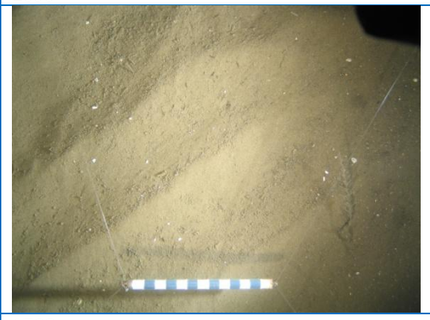
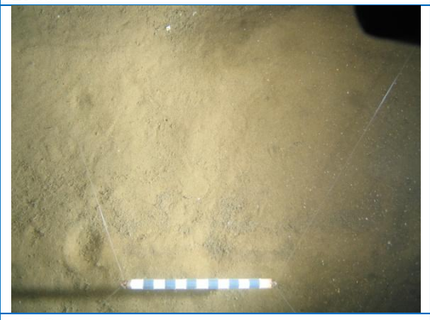
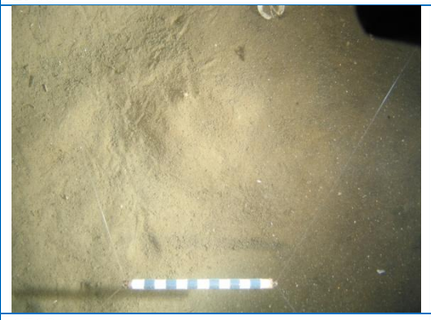
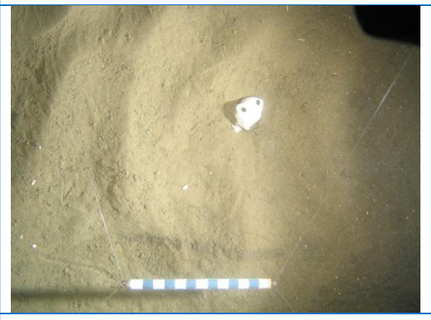
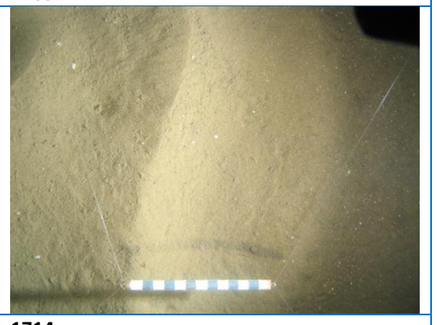
CABA_CAM_51					
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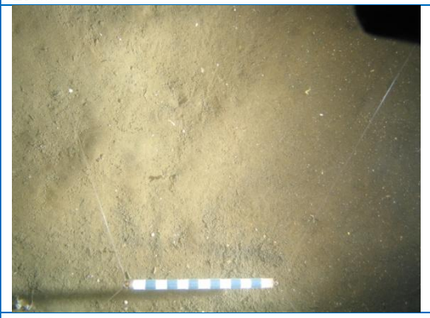
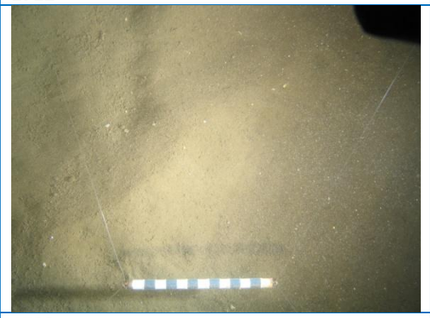
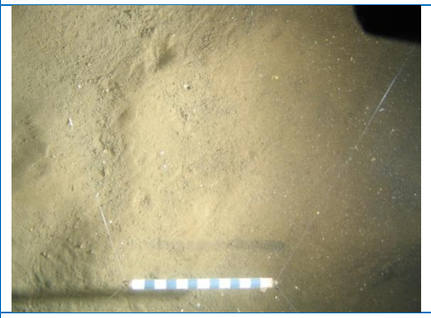
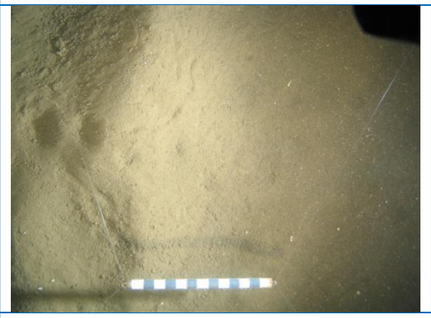
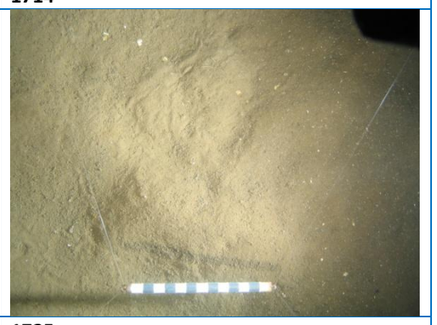
CABA_CAM_52					
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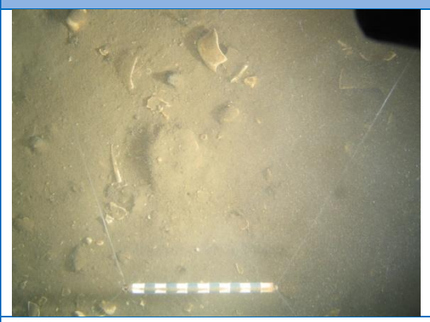
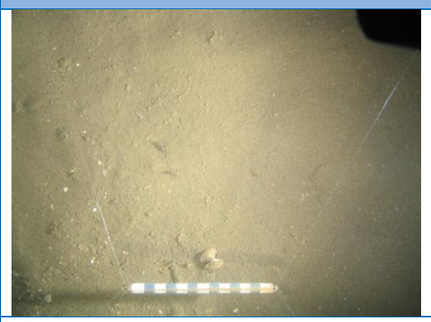
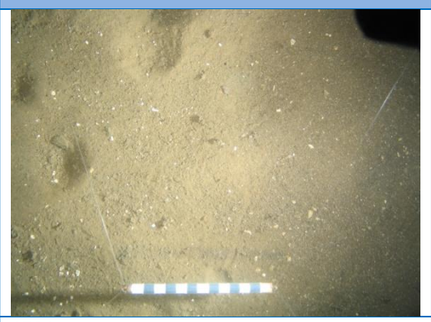
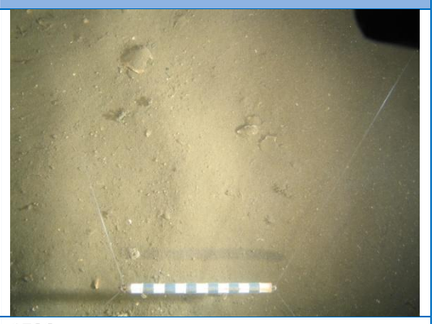
Station ID					
CABA_CAM_53					
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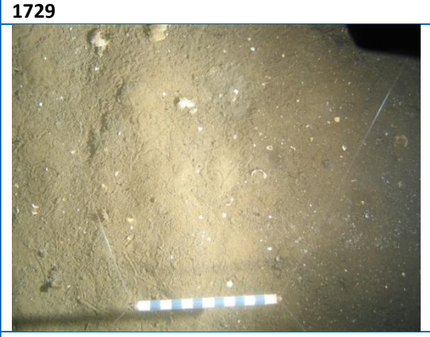
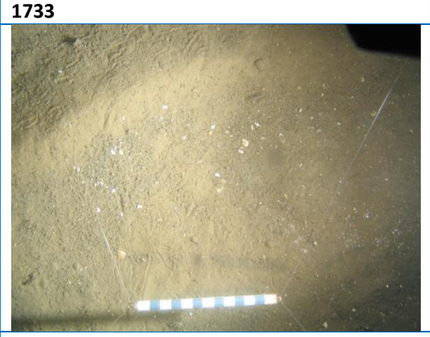
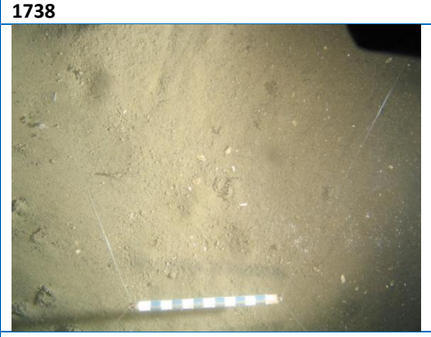
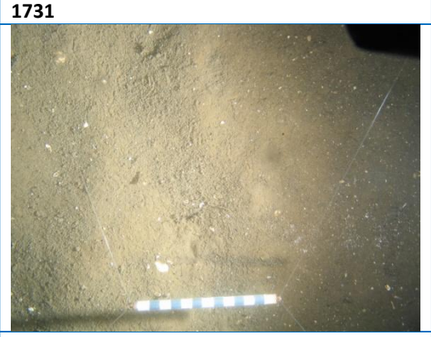
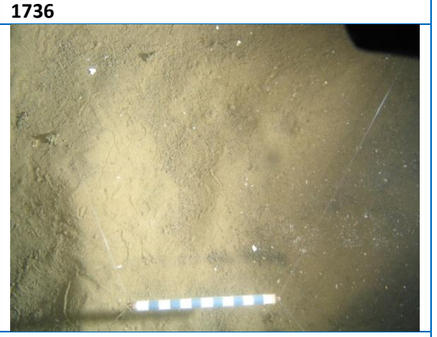
CABA_CAM_54					
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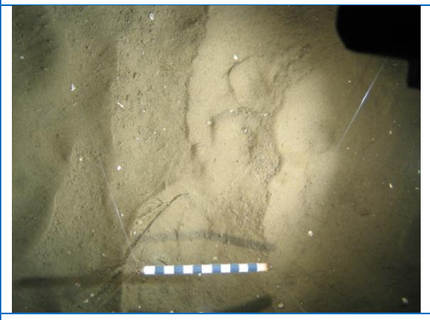
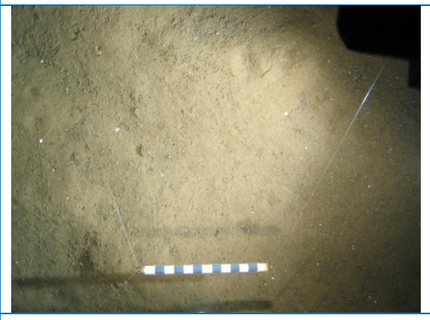
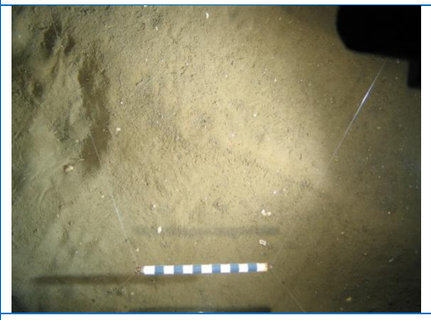
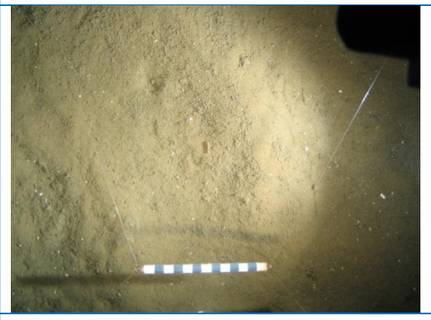
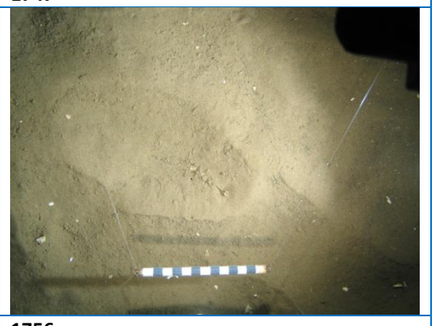
CABA_CAM_55					
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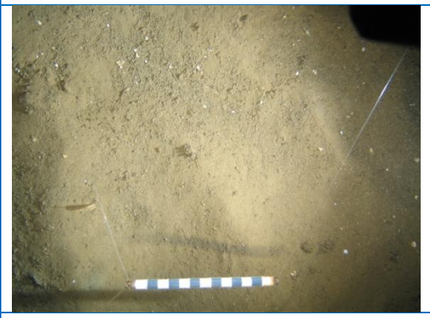
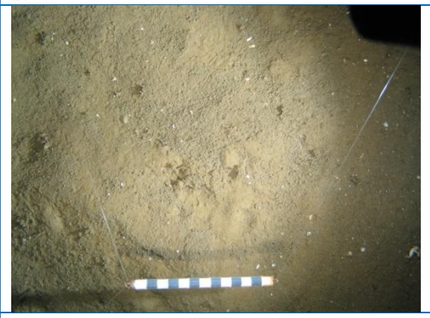
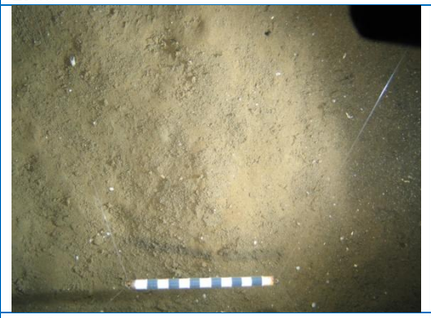
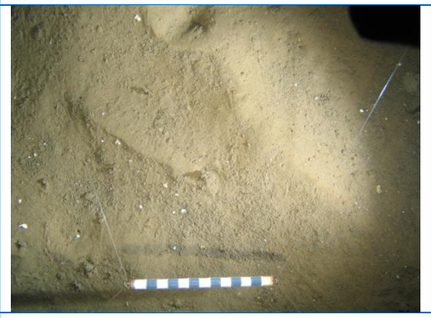
CABA_CAM_56					
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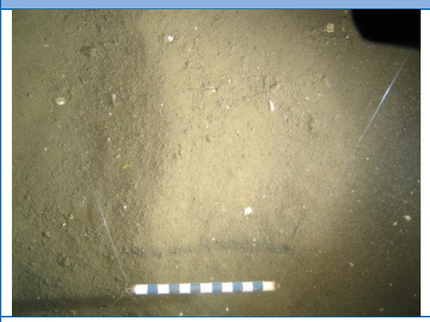
Station ID					
CABA_CAM_57					
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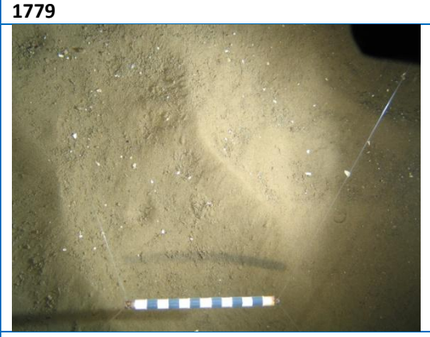
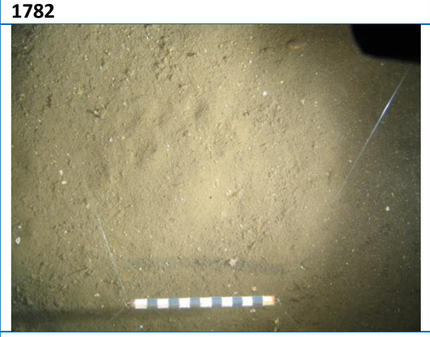
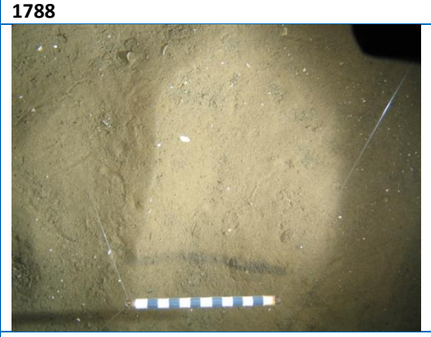
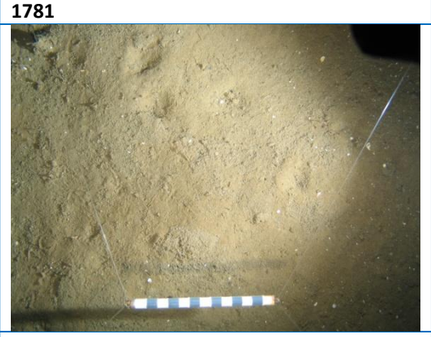
CABA_CAM_58					
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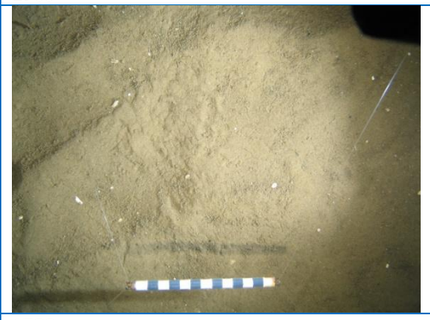
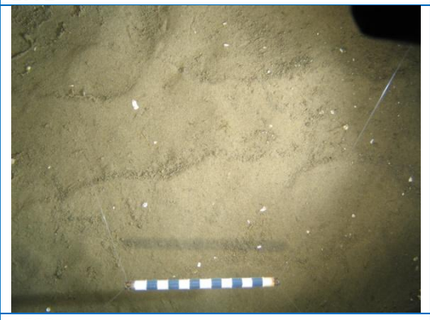
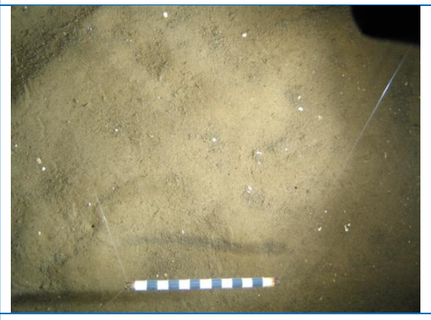
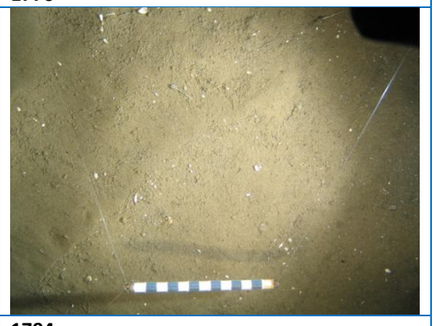
CABA_CAM_59					
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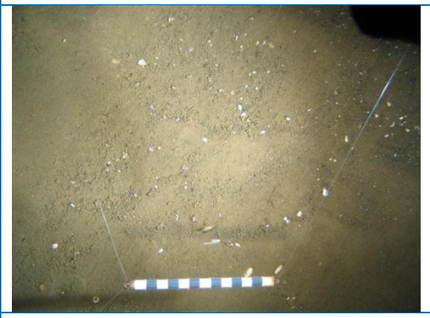
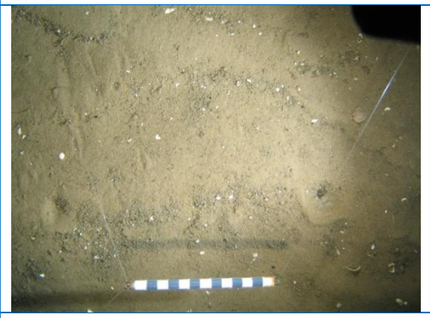
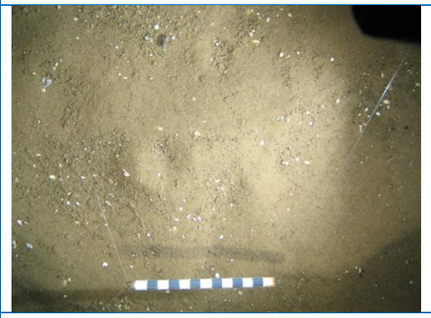
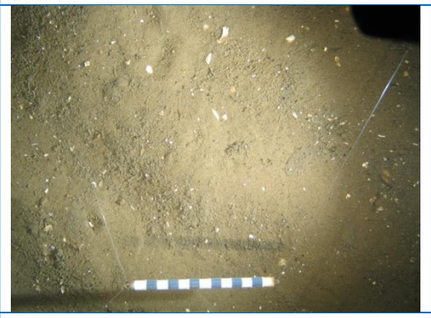
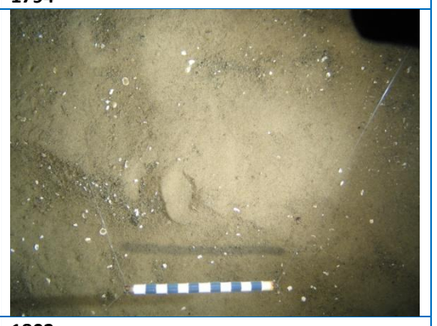
CABA_CAM_60					
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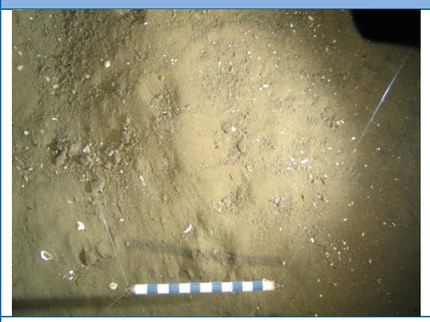
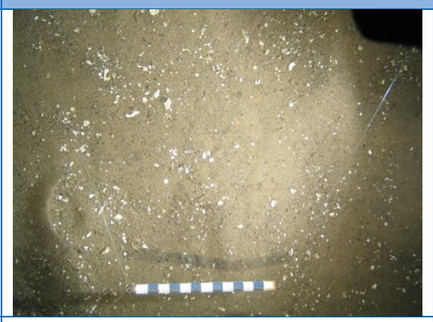
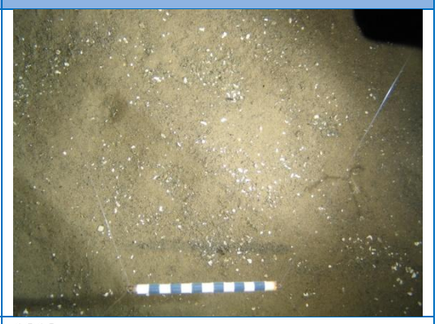
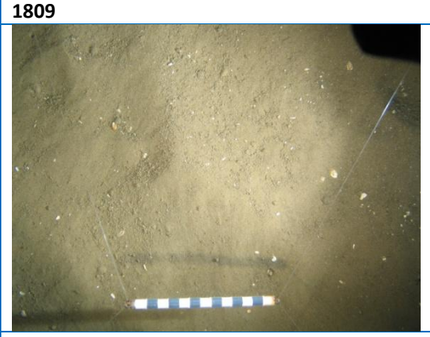
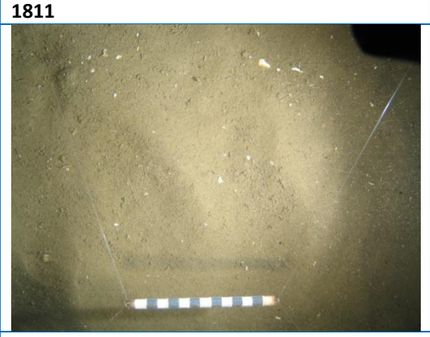
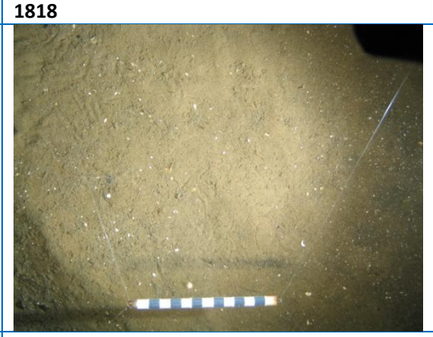
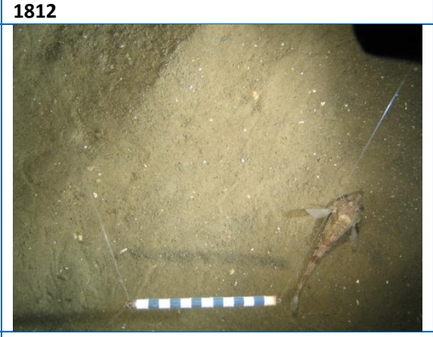
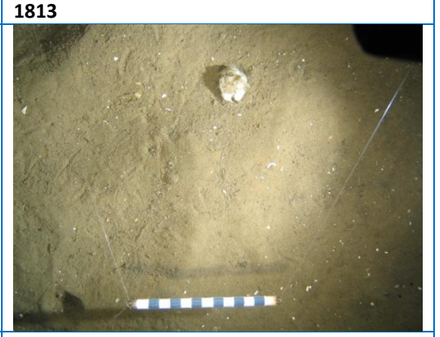
CABA_CAM_61					
	1809	1811	1818	1812	1813
CABA_CAM_62					
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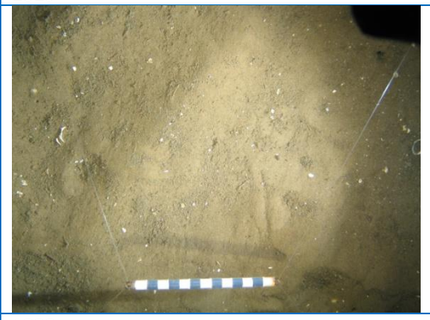
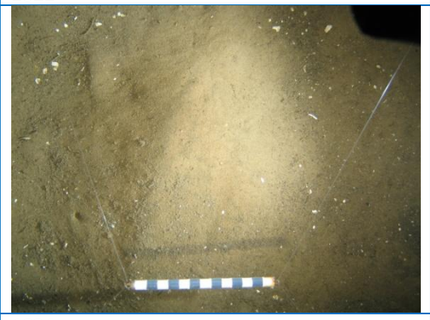
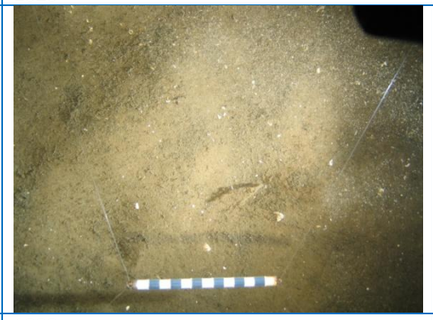
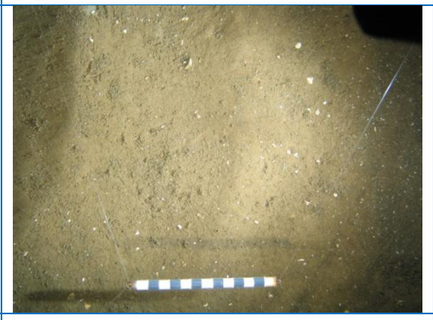
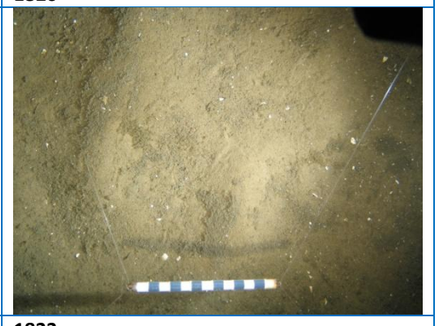
CABA_CAM_63					
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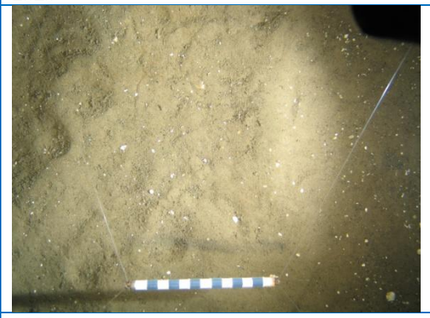
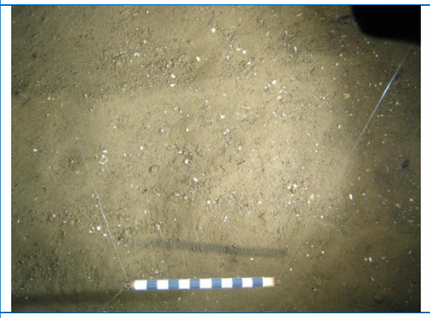
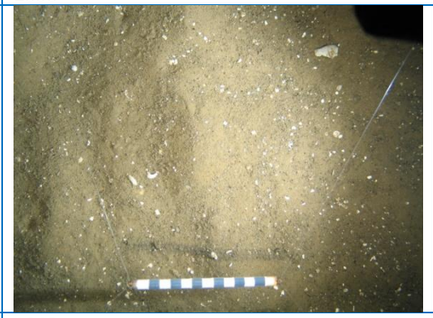
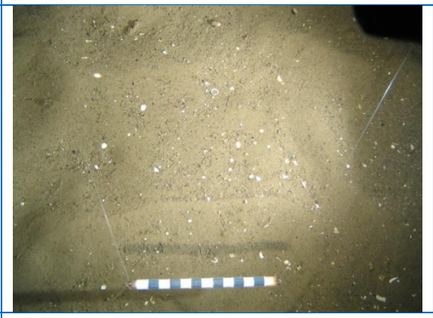
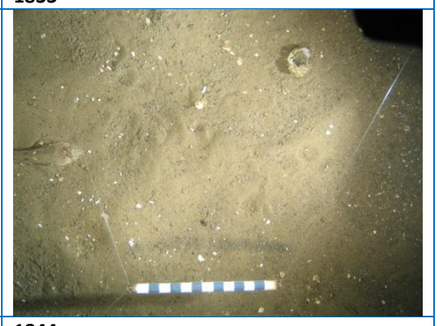
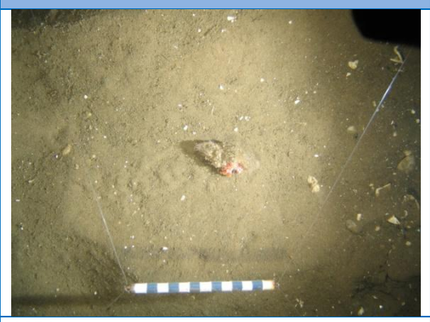
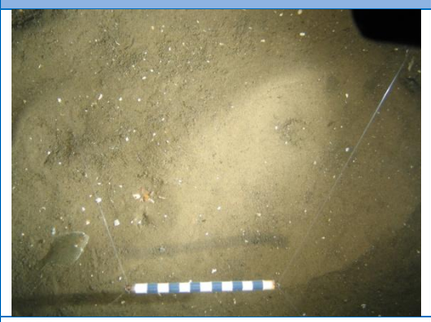
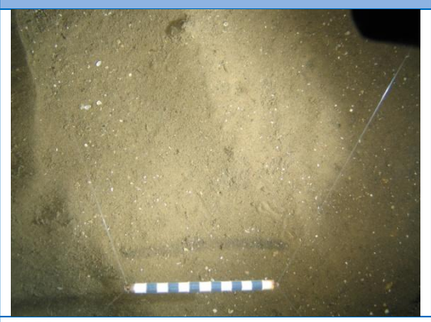
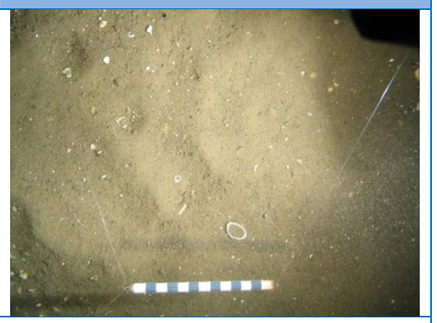
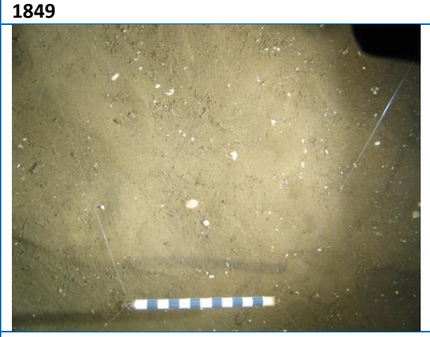
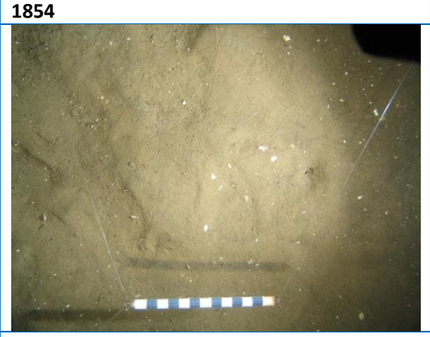
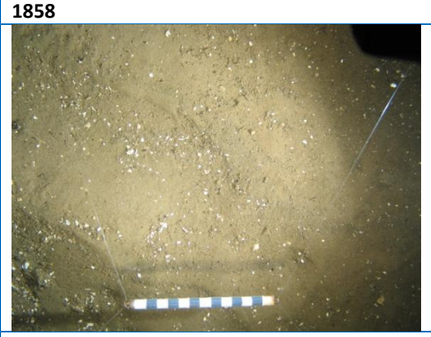
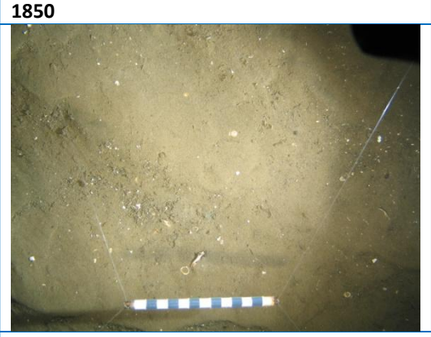
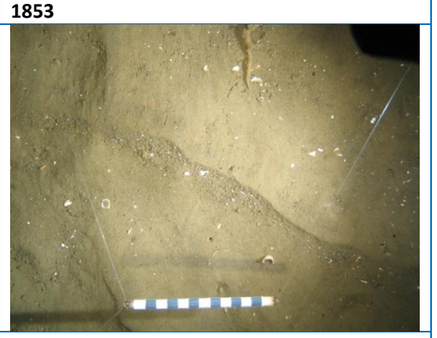
CABA_CAM_64					
	1839	1842	1848	1843	1844

Station ID					
CABA_CAM_65					
	1849	1854	1858	1850	1853
CABA_CAM_66					
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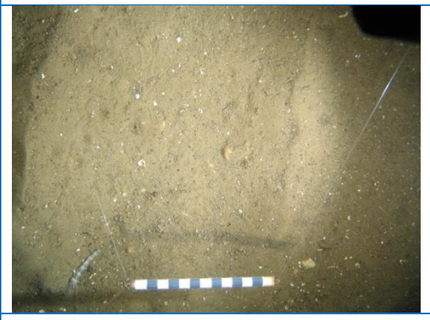
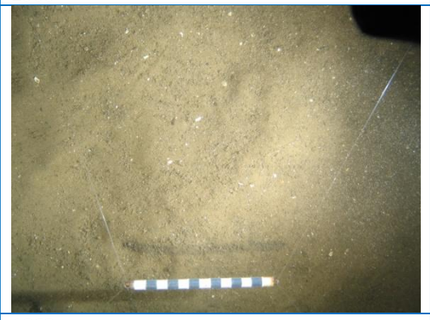
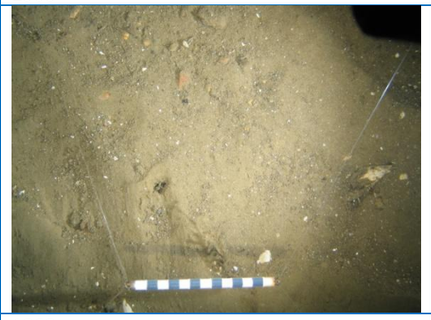
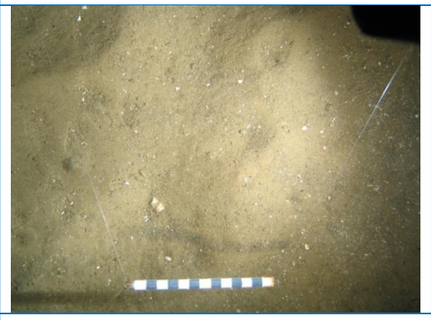
CABA_CAM_67					
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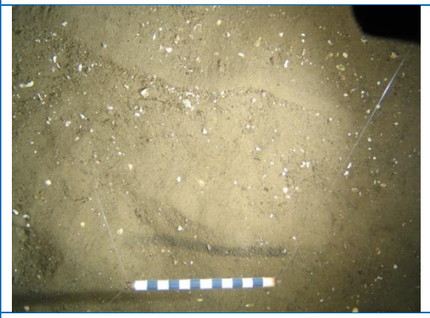
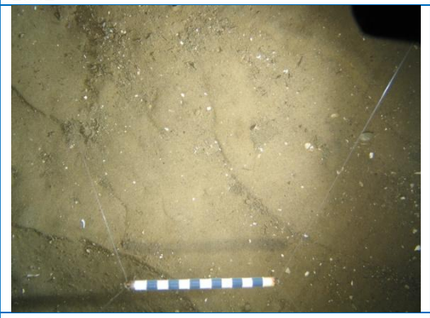
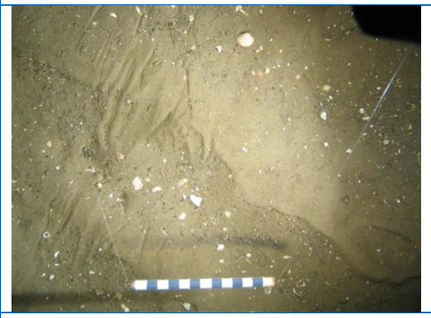
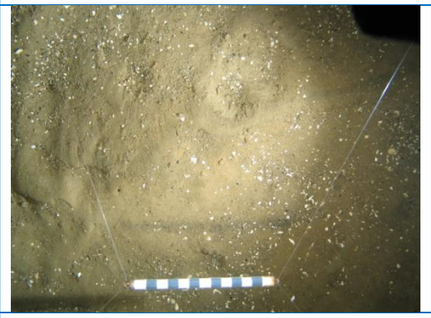
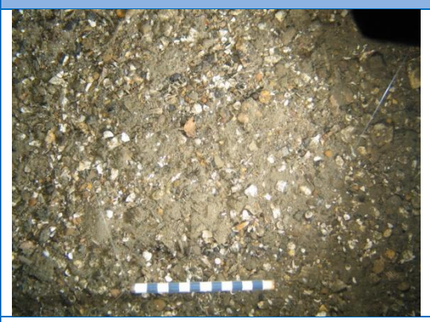
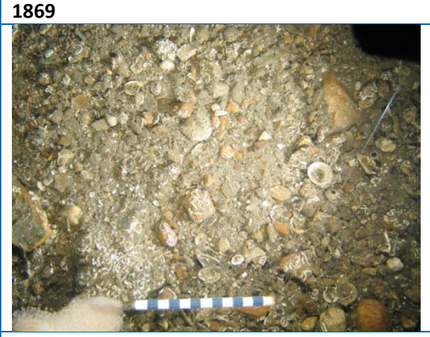
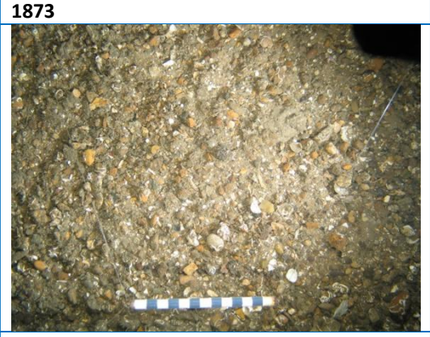
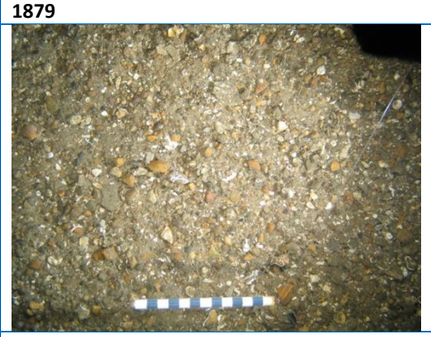
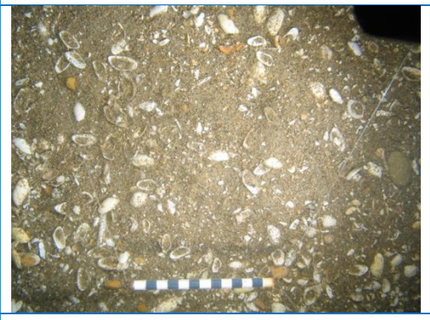
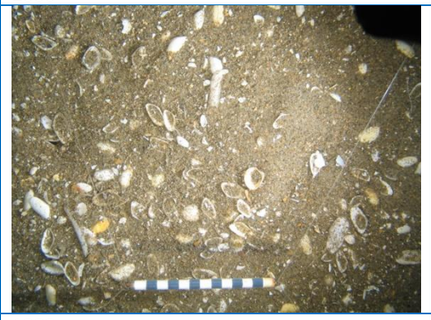
CABA_CAM_68					
	1889	1893	1898	1890	1894

Station ID					
CABA_CAM_69					
	1869	1873	1879	1870	1874
CABA_CAM_70					
	1879	1883	1888	1881	1882
CABA_CAM_71					
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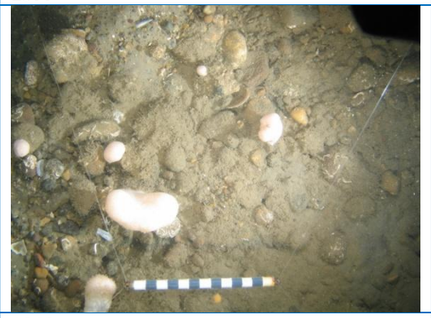
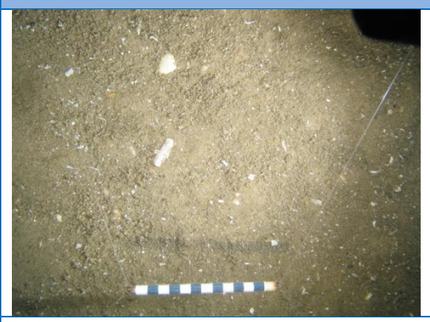
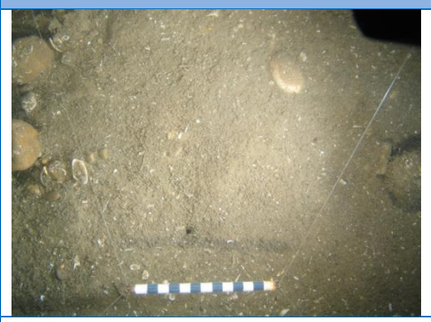
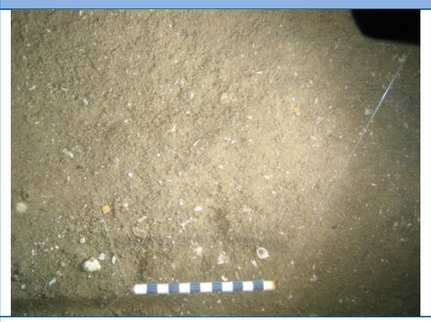
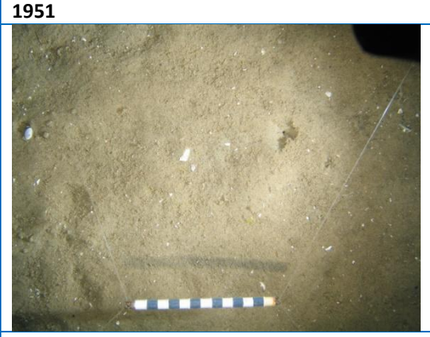
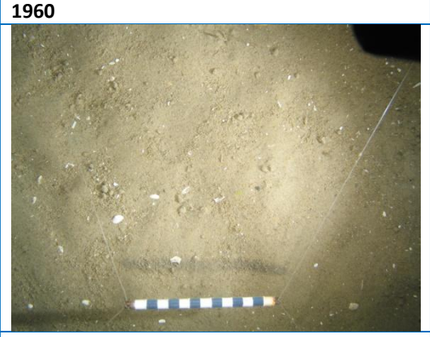
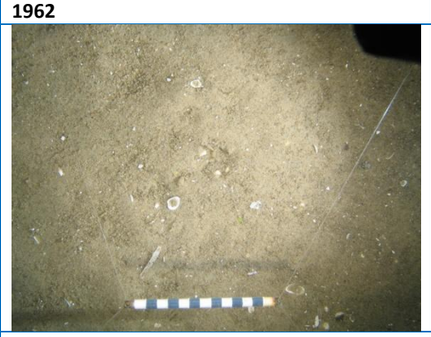
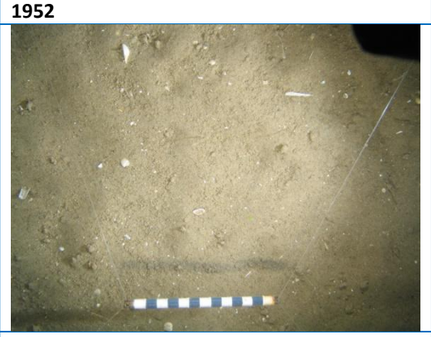
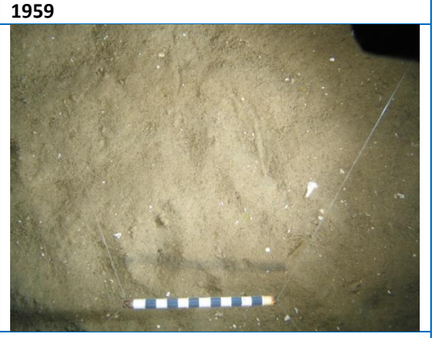
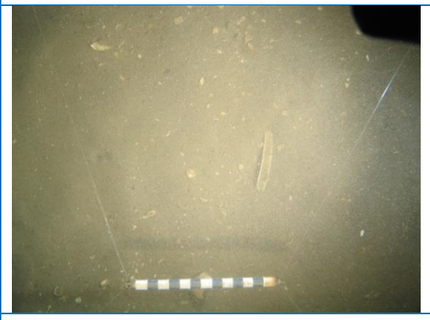
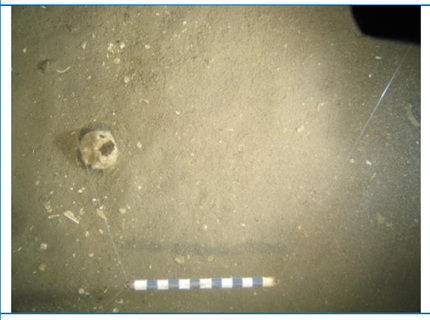
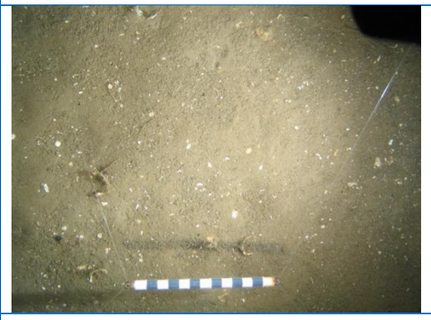
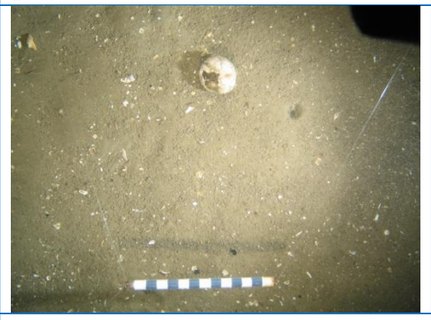
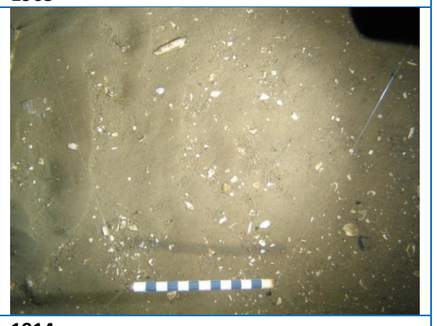
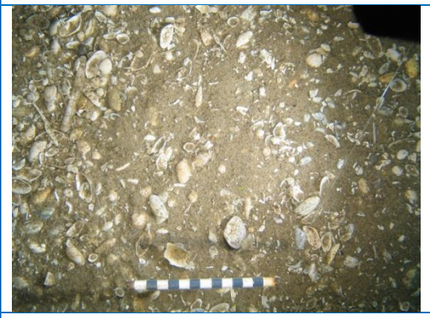
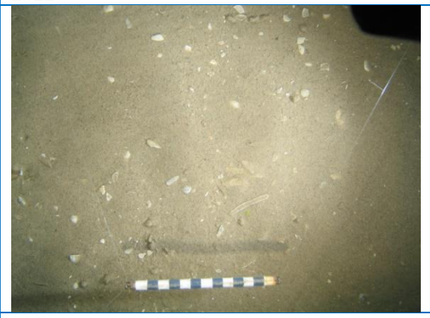
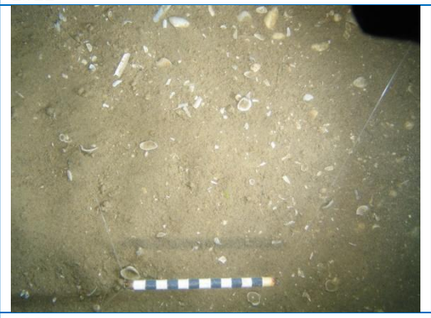
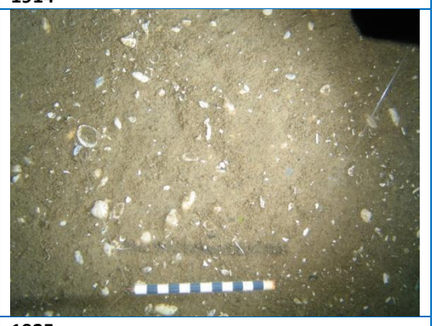
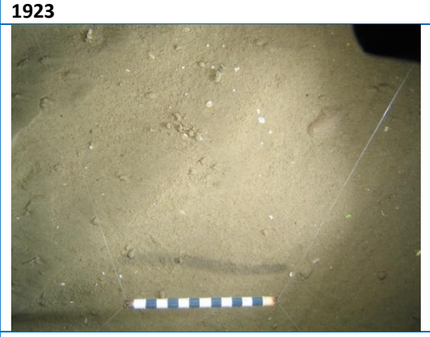
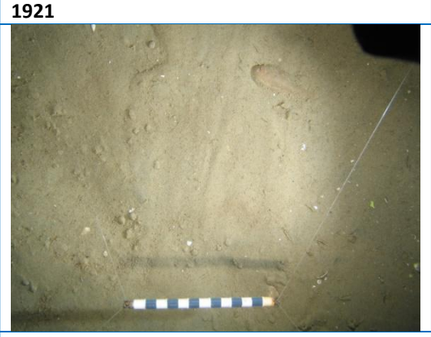
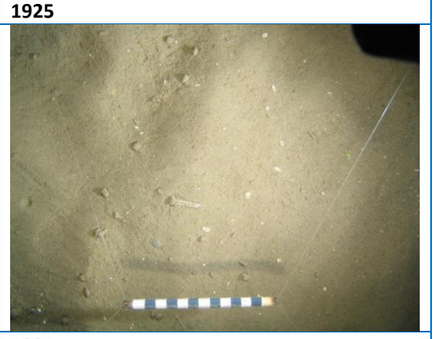
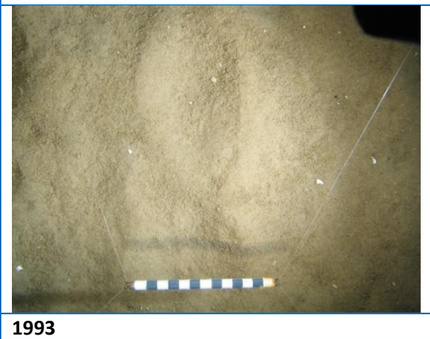
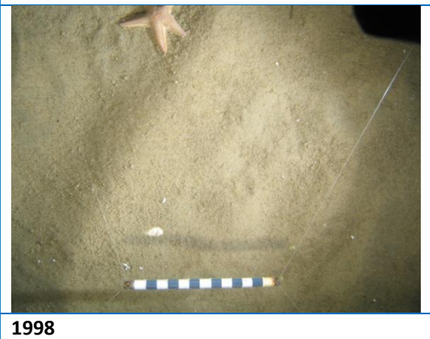
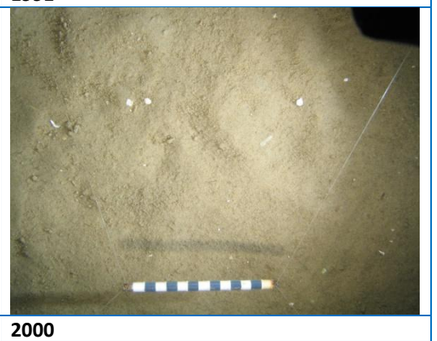
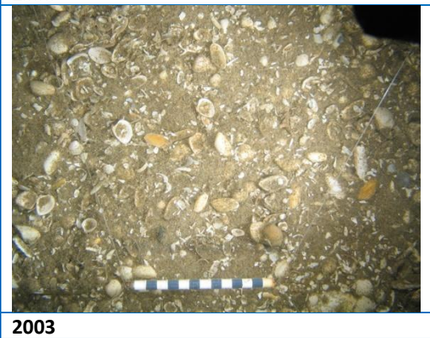
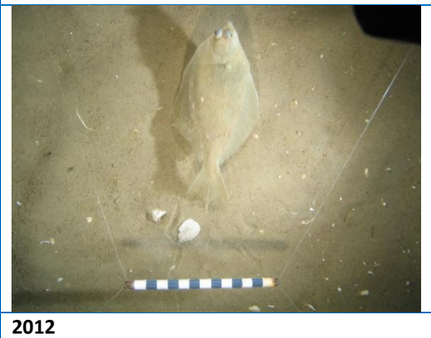
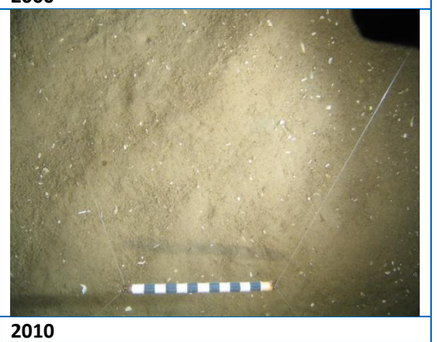
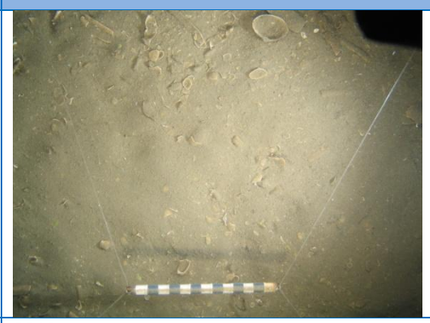
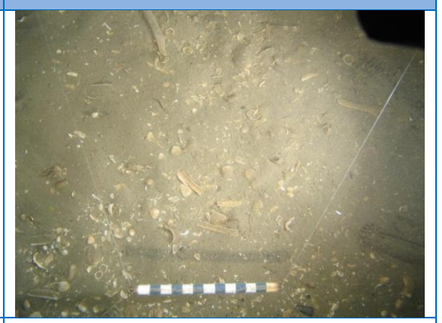
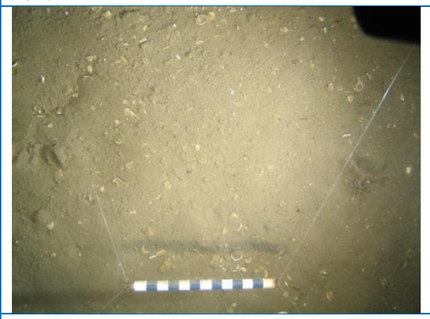
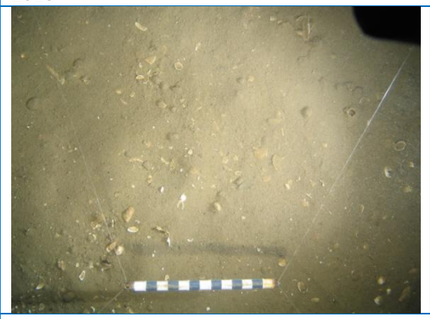
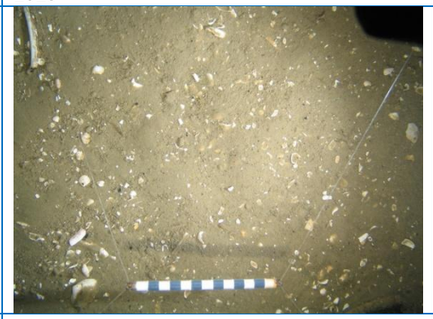
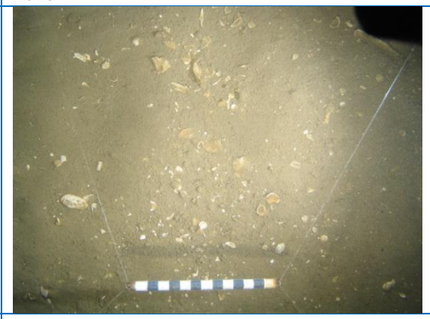
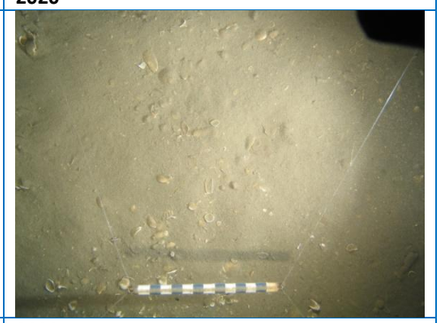
CABA_CAM_72					
	1941	1945	1949	1942	1944

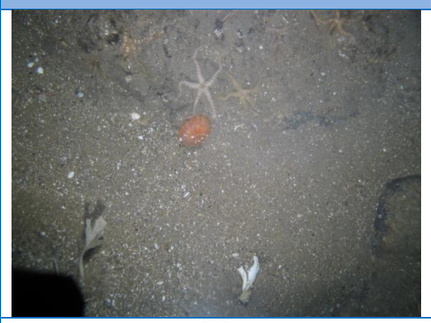
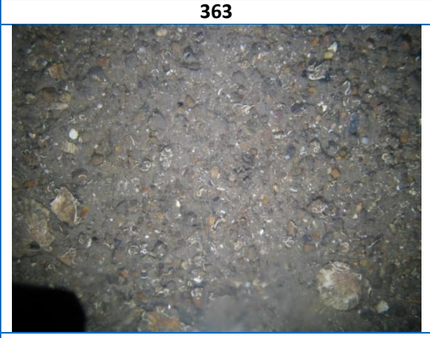
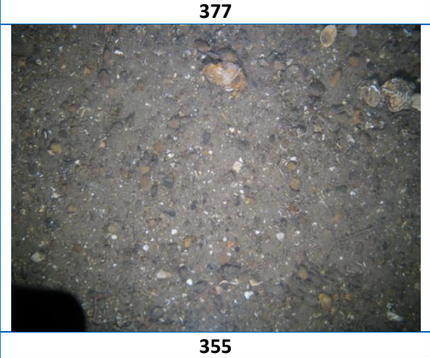
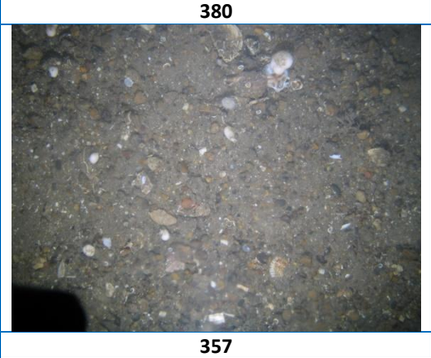
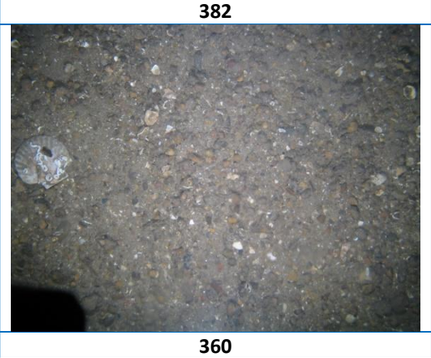
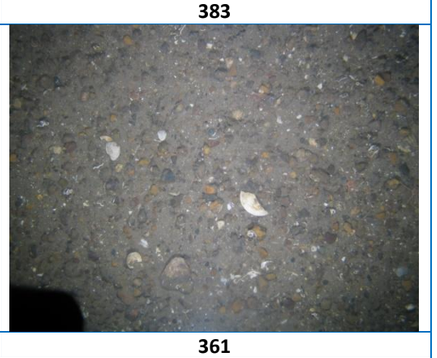
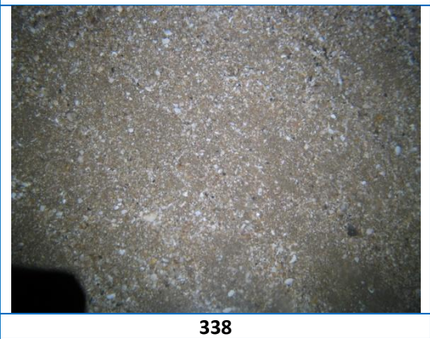
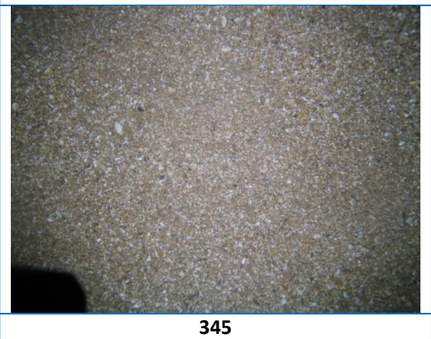
Station ID					
CABA_CAM_73					
	1951	1960	1962	1952	1959
CABA_CAM_74					
	1963	1968	1972	1964	1965
CABA_CAM_75					
	1909	1912	1918	1911	1914
CABA_CAM_76					
	1929	1934	1940	1930	1935

Station ID					
CABA_CAM_77					
	1919	1923	1928	1921	1925
CABA_CAM_78					
	1983	1987	1992	1986	1991
CABA_CAM_79					
	1993	1998	2002	1997	2000
CABA_CAM_80					
	2003	2008	2012	2007	2010

Station ID					
CABA_CAM_81					
	2013	2018	2023	2019	2020
CABA_CAM_82					
	2024	2028	2032	2025	2029

APPENDIX IV NEARSHORE SEABED IMAGES

Dogger Bank R3 Nearshore Benthic Survey J/1/03/1794

Station ID					
NS01					
	363	367	369	370	371
NS02					
	373	377	380	382	383
NS03					
	350	355	357	360	361
NS04					
	335	338	344	345	346